



AITUTAKI WATER QUALITY REPORT APRIL 2025

SUMMARY

Water samples were collected in the morning of Tuesday 29th April, 2025. The weather during collection was reported partially cloudy with an easterly breeze, and calm with no wind at some western sites. All marine sites were accessible and sampled. Boodlea, padina, turbinaria, dictyota, acanthophora, and cyanobacteria algae were sighted at 8 out of 12 marine sites. Only Tautu stream was flowing and sampled, with the four remaining streams reported dry or stagnant. The table below provides a summary of the total suspended solids, enterococci and dissolved oxygen levels.

Lagoon Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Ootu	6.2	<1	77
Vaipeka	4.7	<1	99
Vaipae Wharf	9.6	10	102
Tautu Wharf	10.9	<1	101
Taravao	16.2	41	101
Vainamu	16.7	63	77
Vainamu Wharf	3.9	41	91
Arutanga Wharf	5.5	10	96
Rapae	0.3	<1	71
Maunga Pu	1.3	<1	69
Maina Nursery	0.3	<1	94
Amuri Wharf	3.3	10	81
Stream Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Tautu	6.7	238	40



Grading Scale	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor
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Lagoon:

- Low levels of enterococci bacteria were detected across all marine sites, with over half observing excellent levels of less than 41 MPN/100mL. This indicates safe swimming areas.
- Levels of total suspended solids were excellent to very poor, ranging from 0.3 mg/L to 16.7 mg/L respectively.
- Dissolved oxygen levels ranged from poor to excellent. A poor, low level of 69 % was observed at Maunga Pu and an excellent, high level of 102 % was observed at Vaipae Wharf.
- Lagoon temperatures ranged between 22.3 °C at Vaipeka and 25.9 °C at Maunga Pu, giving an average temperature of 24.7 °C.
- Levels of salinity were stable, ranging from 31.0 ppt at Vainamu to 35.8 ppt at Arutanga Wharf, giving an average of 35.0 ppt.
- The lagoon pH levels were stable, ranging from 7.71 at Vainamu to 8.01 at Maina Nursery, giving an average of 7.86.

Stream:

- An elevated enterococci level of 238 MPN/100 mL was observed at Tautu. The low enterococci level of less than 1 MPN/100 mL observed at Tautu Wharf indicates that the vicinal lagoon area remains safe for swimming.
- An extremely poor dissolved oxygen level of 40% was observed at Tautu.
- The level of total suspended solids was poor, observed at 6.7 mg/L.
- The physical parameters of temperature, salinity and pH were stable and observed at 24.1 °C, 0.2 ppt, and 6.4 respectively.

The rainfall data and lab study report for April can be found at the end of this report.



AITUTAKI WATER QUALITY REPORT MAY 2025

SUMMARY

Water samples were collected the morning of Tuesday 20th May, 2025. The weather during sampling was notably calm at western sites and windy as observed at eastern sites. All lagoon sites were accessible and sampled. Presence of padina, boodlea, codium, caulerpa, dictyota, sargassum, and cyanobacteria algae were observed along the eastern lagoon sites of Ootu, Vaipeka, Vaipae Wharf, Tautu Wharf and Taravao. Tautu was the only stream flowing and sampled, with the remaining four streams recorded as dry or stagnant. The table below provides a summary of total suspended solids, enterococci, and dissolved oxygen levels.

Lagoon Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Ootu	6.7	<1	80
Vaipeka	4.4	30	96
Vaipae Wharf	4.9	<1	103
Tautu Wharf	10.0	<1	101
Taravao	23.3	132	97
Vainamu	7.3	10	69
Vainamu Wharf	3.4	98	84
Arutanga Wharf	3.2	63	62
Rapae	2.6	20	74
Maunga Pu	2.4	<1	72
Maina Nursery	3.0	<1	74
Amuri Wharf	4.1	30	87
Stream Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Tautu	12.3	101	19



Grading Scale	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor
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Lagoon:

- Levels of enterococci bacteria ranged from good to excellent, with 9 out of 12 marine sites observing excellent levels of less than 41 MPN/100mL. Overall, the low bacteria counts observed at all marine sites indicate safe swimming areas.
- Very good to extremely poor levels of total suspended solids were observed, ranging from 2.4 mg/L at Maunga Pu to 23.3 mg/L at Taravao.
- The levels of dissolved oxygen ranged from excellent to poor, ranging from 103% at Vaipae Wharf to 62% at Arutanga Wharf. Excellent levels of dissolved oxygen, recorded as greater than 95%, were observed along the eastern lagoon sites of Vaipeka, Vaipae Wharf, Tautu Wharf, and Taravao.
- Temperatures ranged from 25.1 °C at Vaipeka to 27.9 °C at Vainamu, giving an average lagoon temperature of 26.9 °C.
- The pH levels were stable ranging from 7.56 at Vainamu to 7.97 at Maina Nursery, giving an average pH level of 7.82.
- Salinity levels were stable, ranging between 30.0 ppt observed at Taravao and 35.3 ppt observed at Maina Nursery. The average salinity level for marine sites was recorded at 33.9 ppt.

Stream:

- A good enterococci level of 101 MPN/100mL was observed, indicating a safe swimming area.
- A very poor level of total suspended solids was observed at 12.3 mg/L, and an extremely poor dissolve oxygen level was observed at 19%.
- The physical parameters of temperature, salinity and pH were stable and observed at 25.2 °C, 0.2 ppt and 6.7 respectively.

The rainfall data and lab study report for May can be found at the end of this report.



AITUTAKI WATER QUALITY REPORT JUNE 2025

SUMMARY

Water samples were collected in the morning of Tuesday 3rd June, 2025. The weather during sampling was notably windy across all sites, and only slightly overcast at some eastern sites. All marine sites were accessible and sampled. The lagoon sites of Taravao, Vainamu and Vainamu Wharf were observed to be dirty and murky at the time of sampling. Observations of boodlea and rhizoclonium algae were recorded at Ootu, Vaipeka, Tautu wharf, Taravao, and Vainamu sites. Vaitiare stream was the only stream flowing and sampled, while the remaining four streams were recorded as dry or stagnant. The tables below summarize the levels of total suspended solids, dissolved oxygen, and enterococci.

Lagoon Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Ootu	4.9	<1	102
Vaipeka	13.1	52	110
Vaipae Wharf	4.4	<1	110
Tautu Wharf	2.3	52	108
Taravao	41.7	63	114
Vainamu	44.4	52	81
Vainamu Wharf	16.7	146	95
Arutanga Wharf	3.1	10	68
Rapae	1.3	10	93
Maunga Pu	1.3	10	101
Maina Nursery	1.3	<1	92
Amuri Wharf	3.3	20	95
Stream Site	Total Suspended Solids (mg/L)	Enterococci (MPN/100 mL)	Dissolved Oxygen (%)
Vaitiare	26.7	88	24



Grading Scale	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor
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Lagoon:

- Eleven out of twelve lagoon sites observed good to excellent enterococci levels, ranging from less than 1 MPN/100 mL to 146 MPN/100 mL. This indicates safe swimming areas. An extremely poor level of 638 MPN/100 mL was initially detected at Tautu Wharf. A resampling was conducted on Friday 6th June to investigate persistence of elevated enterococci levels at this site. The resample result observed a very good enterococci level of 52 MPN/100 mL, indicating a safe swimming area.
- Dissolved oxygen levels ranged from poor to excellent. A poor, low level of 68% was observed at Arutanga Wharf and an excellent, high level of 114% was observed at Taravao.
- Levels of total suspended solids ranged from extremely poor with 44.4 mg/L observed at Vainamu, to a very good level of 1.3 mg/L observed at Rapae, Maunga Pu, and Maina Nursery.
- Temperatures ranged from 24.1 °C at Vaipeka to 27.0 °C at Maunga Pu, giving an average lagoon temperature of 25.7 °C.
- A low salinity level of 27.1 ppt was detected at Tautu Wharf indicating fresh water influence. Salinity levels at the remaining eleven sites ranged from 30.6 ppt at Vainamu and 35.1 ppt at Maina Nursery. The overall average salinity was 32.7 ppt.
- pH levels were stable, ranging from 7.58 at Vainamu and 8.02 at Maina Nursery, giving an average of 7.85.

Stream:

- A very good, low level of enterococci of 88 MPN/100 mL was observed at Vaitiare.
- Extremely poor levels of both total suspended solids and dissolved oxygen were observed at Vaitiare and detected at 26.7 mg/L and 24% respectively.
- Physical parameters of temperature, salinity, and pH were stable and observed at 25.3 °C, 0.3 ppt, and 6.6 respectively.

The rainfall data and lab study report for June can be found at the end of this report.

1. BACTERIAL COUNTS - AITUTAKI - Most Probable Number of Enterococci per 100 mL (MPN/100mL)

Lagoon Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Ootu	AIM02	10	97	ND	<1	<1	<1
Vaipeka	AIM04	10	<1	ND	<1	30	52
Vaipae Wharf	AIM05	<1	63	ND	10	<1	<1
Tautu Wharf	AIM06	<1	<1	ND	<1	<1	638
Taravao	AIM07	10	<1	ND	41	132	63
Vainamu	AIM08	30	121	ND	63	10	52
Vainamu Wharf	AIM09	86	<1	ND	41	98	146
Arutanga Wharf	AIM10	<1	<1	ND	10	63	10
Rapae	AIM11	<1	10	ND	<1	20	10
Maunga Pu	AIM12	<1	63	ND	<1	<1	10
Maina Nursery	AIM14	<1	10	ND	<1	<1	<1
Amuri Wharf	AIM16	<1	10	ND	10	30	20

Stream Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Vaitiare	AIS01	28	NW	ND	NW	NW	88
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	79	NW	NW	NW	NW	NW
Tautu	AIS07	18	225	ND	238	101	NW



Bacteria Standards GRADING SCALE	< 41	41 ≥ 100	101 ≥ 200	201 ≥ 350	351 ≥ 500	> 500
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor

REFERENCE: WHO 2021 Guidelines on Recreational Water Quality for Coastal and Fresh Waters.

2. TOTAL SUSPENDED SOLIDS - AITUTAKI - Milligrams per Litre (mg/L)

Lagoon Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Ootu	AIM02	8.0	2.3	9.3	6.2	6.7	4.9
Vaipeka	AIM04	2.0	3.5	6.7	4.7	4.4	13.1
Vaipae Wharf	AIM05	4.0	4.3	6.0	9.6	4.9	4.4
Tautu Wharf	AIM06	4.0	2.3	3.0	10.9	10.0	2.3
Taravao	AIM07	7.8	6.3	7.0	16.2	23.3	41.7
Vainamu	AIM08	9.7	7.1	8.9	16.7	7.3	44.4
Vainamu Wharf	AIM09	5.7	3.3	3.0	3.9	3.4	16.7
Arutanga Wharf	AIM10	4.0	3.3	4.0	5.5	3.2	3.1
Rapae	AIM11	1.0	2.3	1.0	0.3	2.6	1.3
Maunga Pu	AIM12	3.0	3.2	2.0	1.3	2.4	1.3
Maina Nursery	AIM14	0.3	2.3	1.0	0.3	3.0	1.3
Amuri Wharf	AIM16	9.0	3.3	0.3	3.3	4.1	3.3

Stream Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Vaitiare	AIS01	0.3	NW	3.1	NW	NW	26.7
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	3.0	NW	NW	NW	NW	NW
Tautu	AIS07	11.1	5.8	4.5	6.7	12.3	NW



Total Suspended Solids Standards GRADING SCALE	< 1.0	1.0 ≥ 2.5	2.5 ≥ 5.0	5 ≥ 10	10 ≥ 20	> 20
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor

REFERENCE: Bell 1992, total suspended solids recommended limit is ≤5mg/L for healthy coral reef.

3. DISSOLVED OXYGEN - AITUTAKI - Percent (%)

Lagoon Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Ootu	AIM02	71.9	75	66	77	80	102
Vaipeka	AIM04	58.0	38	50	99	96	110
Vaipae Wharf	AIM05	65.7	68	57	102	103	110
Tautu Wharf	AIM06	59.2	68	54	101	101	108
Taravao	AIM07	70.0	44	58	101	97	114
Vainamu	AIM08	64.5	53	47	77	69	81
Vainamu Wharf	AIM09	45.1	30	78	91	84	95
Arutanga Wharf	AIM10	70.3	75	73	96	62	68
Rapae	AIM11	72.9	71	73	71	74	93
Maunga Pu	AIM12	55.3	64	68	69	72	101
Maina Nursery	AIM14	62.8	90	74	94	74	92
Amuri Wharf	AIM16	58.1	69	56	81	87	95

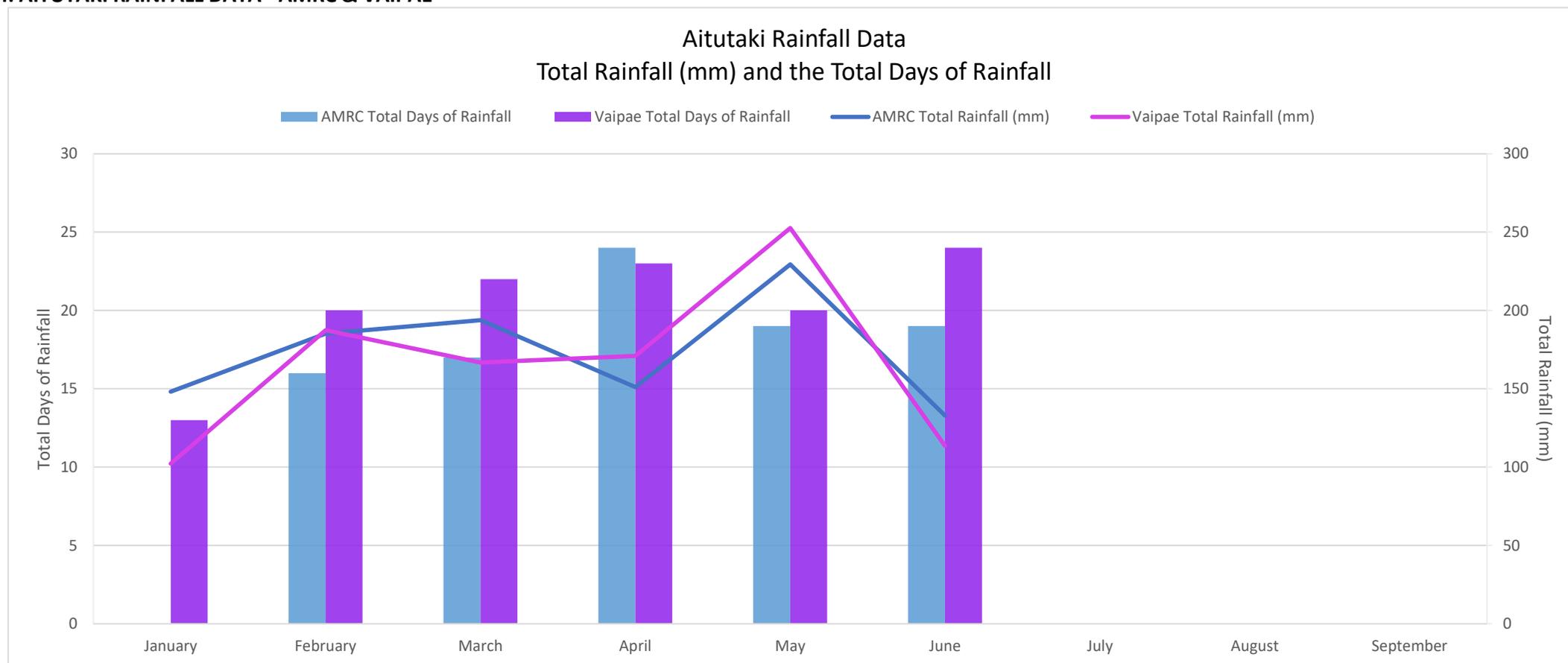
Stream Site	Site ID	Jan	Feb	Mar	Apr	May	Jun
Vaitiare	AIS01	41.7	NW	40	NW	NW	24
Vaipae	AIS02	NW	NW	NW	NW	NW	NW
Pata	AIS03	NW	NW	NW	NW	NW	NW
Arutanga	AIS04	42.4	NW	NW	NW	NW	NW
Tautu	AIS07	22.0	28	19	40	19	NW



Dissolved Oxygen Standards GRADING SCALE	> 95	90 ≥ 95	80 ≥ 90	60 ≥ 80	40 ≥ 60	< 40
	A	B	C	D	E	F
	Excellent	Very Good	Good	Poor	Very Poor	Extremely Poor

REFERENCE: Department of Health, Clean Water Branch Hawaii 1994: Dissolved oxygen recommended limit is ≥75% saturation for oceanic waters, embayments, open coastal waters & estuaries; ≥80% saturation for streams.

4. AITUTAKI RAINFALL DATA - AMRC & VAIPAE



	January	February	March	April	May	June	July	August	September	October	November	December
AMRC Total Rainfall (mm)	148.1	185.2	193.8	151.0	229.4	132.9						
AMRC Total Days of Rainfall	ND	16	17	24	19	19						
AMRC Day of Highest Rainfall	ND	19th 43.8mm	3rd 39.6mm	6th 75.8mm	24th 95.0mm	26th 72.4mm						
Vaipae Total Rainfall (mm)	102.2	187.4	166.8	171	252.6	113.6						
Vaipae Total Days of Rainfall	13	20	22	23	20	24						
Vaipae Day of Highest Rainfall	10th 26.2mm	19th 44.4mm	3rd 33.0mm	6th 68.4mm	24th 100.2mm	26th 52.0mm						

5. AVERAGE TEMPERATURE - AITUTAKI - Degrees (°C)

Month	January	February	March	April	May	June	July	August	September	October	November	December
Lagoon	26.2	29.2	28.6	24.7	26.9	25.7						
Stream	25.1	26.4	26.8	24.1	25.2	25.3						

Report Date: 01.07.2025		AITUTAKI LAB STUDY REPORT – APRIL 2025				Lab Report No.: 04L5124 – 04L5136		
SAMPLE DESCRIPTION								
Date Samples Collected:		Name of Sample:	Collected By:	Submitted By:	Time of Receipt:		Physical Description:	Quantity Per Site Received:
Tuesday 29 th April		Marine Stream	MMR		10:20am		Clear	2.5L
Study No.		1	2	3	4	5	6	7
SITE ID	LAB ID	Enterococci	Temperature	Salinity	Dissolved Oxygen	Dissolved Oxygen	pH	Total Suspended Solids
MARINE		(MPN/100ml)	(°C)	(ppt)	(%)	(mg/L)		(mg/L)
AIM02	04L5124	<1	25.4	35.7	76.7	5.14	7.86	6.2
AIM04	04L5125	<1	22.3	34.1	98.6	7.04	7.76	4.7
AIM05	04L5126	10	24.6	35.4	102.1	6.94	7.96	9.6
AIM06	04L5127	<1	24.1	35.7	101.4	6.94	7.89	10.9
AIM07	04L5128	41	22.8	35.7	100.5	7.04	7.88	16.2
AIM08	04L5129	63	24.1	31.0	77.0	5.42	7.71	16.7
AIM09	04L5130	41	24.9	35.5	91.0	6.16	7.79	3.9
AIM10	04L5131	10	25.3	35.8	96.2	6.45	7.99	5.5
AIM11	04L5132	<1	25.3	35.5	70.9	4.76	7.84	0.3
AIM12	04L5133	<1	25.9	34.1	69.4	4.66	7.81	1.3
AIM14	04L5134	<1	25.7	35.7	94.4	6.29	8.01	0.3
AIM16	04L5135	10	25.5	35.6	80.5	5.39	7.87	3.3
STREAM								
AIS07	04L5136	238	24.1	0.2	39.7	3.3	6.4	6.7
Study Method		IDEXX Enterolert*	YSI Manual	YSI Manual	YSI Manual	YSI Manual	YSI Manual	MMR Lab Manual Water Quality Monitoring V5
Recommended Limit		Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments

This report includes data based on adopting recommended Good Lab Practices and the information and contents reflects the findings of the Ministry's Laboratory only and within the limits of customer instruction. The document cannot be reproduced in full/part without prior written approval of the Ministry. The tested samples of external customers are retained for a period of 30 days only.

Report Date: 01.07.2025		AITUTAKI LAB STUDY REPORT – MAY 2025				Lab Report No.: 05L5152 – 05L5164		
SAMPLE DESCRIPTION								
Date Samples Collected:		Name of Sample:	Collected By:	Submitted By:	Time of Receipt:		Physical Description:	Quantity Per Site Received:
Tuesday 20 th May		Marine Stream	MMR		10:10am		Clear Clear	2.5L
Study No.		1	2	3	4	5	6	7
SITE ID	LAB ID	Enterococci	Temperature	Salinity	Dissolved Oxygen	Dissolved Oxygen	pH	Total Suspended Solids
MARINE		(MPN/100ml)	(°C)	(ppt)	(%)	(mg/L)		(mg/L)
AIM02	05L5152	<1	27.6	34.4	79.6	5.17	7.87	6.7
AIM04	05L5153	30	25.1	33.9	95.8	6.52	7.70	4.4
AIM05	05L5154	<1	27.1	34.6	103.2	6.76	7.96	4.9
AIM06	05L5155	<1	26.7	35.1	100.5	6.61	7.91	10.0
AIM07	05L5156	132	25.5	30.0	96.8	6.69	7.84	23.3
AIM08	05L5157	10	27.9	31.2	68.9	4.54	7.56	7.3
AIM09	05L5158	98	27.6	34.0	83.5	5.44	7.72	3.4
AIM10	05L5159	63	26.7	35.0	61.7	4.06	7.95	3.2
AIM11	05L5160	20	26.9	34.1	74.3	4.90	7.72	2.6
AIM12	05L5161	<1	27.6	34.5	71.8	4.67	7.73	2.4
AIM14	05L5162	<1	26.7	35.3	74.1	4.87	7.97	3.0
AIM16	05L5163	30	27.3	34.4	86.5	5.65	7.88	4.1
STREAM								
AIM07	05L5164	101	25.2	0.2	19.3	1.6	6.7	12.3
Study Method		IDEXX Enterolert*	YSI Manual	YSI Manual	YSI Manual	YSI Manual	YSI Manual	MMR Lab Manual Water Quality Monitoring V5
Recommended Limit		Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments

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Report Date: 01.07.2025		AITUTAKI LAB STUDY REPORT – JUNE 2025				Lab Report No.: 06L5189 -06L5201		
SAMPLE DESCRIPTION								
Date Samples Collected:		Name of Sample:	Collected By:	Submitted By:	Time of Receipt:		Physical Description:	Quantity Per Site Received:
Tuesday 3 rd June		Marine	MMR		10:20am		Slightly turbid	2.5L
		Stream					Slightly turbid	
Study No.		1	2	3	4	5	6	7
SITE ID	LAB ID	Enterococci	Temperature	Salinity	Dissolved Oxygen	Dissolved Oxygen	pH	Total Suspended Solids
MARINE		(MPN/100ml)	(°C)	(ppt)	(%)	(mg/L)		(mg/L)
AIM02	06L5189	<1	26.3	34.2	101.5	6.76	7.92	4.9
AIM04	06L5190	52	24.1	33.1	110.3	7.67	7.78	13.1
AIM05	06L5191	<1	25.5	34.4	109.8	7.39	7.93	4.4
AIM06	06L5192	638	25.3	27.1	108.1	7.61	7.92	2.3
AIM07	06L5193	63	24.5	31.8	114.4	7.96	7.84	41.7
AIM08	06L5194	52	25.3	30.6	80.6	5.57	7.58	44.4
AIM09	06L5195	146	25.9	31.5	94.5	6.43	7.75	16.7
AIM10	06L5196	10	26.3	34.7	68.3	4.53	7.93	3.1
AIM11	06L5197	10	25.5	32.2	93.4	6.37	7.77	1.3
AIM12	06L5198	10	27.0	33.5	100.6	6.64	7.85	1.3
AIM14	06L5199	<1	26.5	35.1	91.7	6.05	8.02	1.3
AIM16	06L5200	20	26.0	34.1	95.0	6.36	7.89	3.3
STREAM								
AIS01	06L5201	88	25.3	0.30	24.2	2.0	6.6	26.7
Study Method		IDEXX Enterolert*	YSI Manual	YSI Manual	YSI Manual	YSI Manual	YSI Manual	MMR Lab Manual Water Quality Monitoring V5
Recommended Limit		Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments	Ref. Comments

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Abbreviation

NL: Not Listed, MPN: Most Probable Number, cfu: Colony Forming Unit, mL: milli Litre, FAU: Formazin Attenuation Unit, NTU: Nephelometric Turbidity Unit, ppt: Parts Per Thousand, DB: Designated Bathing Beach, MB: Moderate Use of Bathing, LB: Light Use of Bathing, IB: Infrequent Use of Bathing
NA: Not Available, however data will be available at a later date; ND: No Data due to equipment failure or logistics problems or time delay or methodology problem or combination of all; NW: No Water, stream dry or water stagnant or water level too low for sample collection or water dirty/murky.

Comments

1. Temperature[#]
Subtropical regions (south of Cape Canaveral and Tampa Bay, Florida, and Hawaii).
Short-term Max. 32.2°C, Max. True daily mean 29.4°C (average of 24-hourly temperature reading).
Temperature is the measure of warmth and coldness, reported as an average and measured in degrees celcius (°C).
2. pH
Changes to pH can be caused by a range of potential water quality problems (e.g., low values due to acid sulphate runoff). pH values are also related to soil geology and may be naturally low or high (in limestone areas). High pH values can also be caused temporarily when high rates of photosynthesis by aquatic plants (including algae) lead to a decrease in carbon dioxide, and therefore a decrease in carbonic acid in the water.
3. Salinity
A measure of the amount of dissolved salts in the water, and therefore an indicator of salinity. Excess salinity in freshwater streams occurs as a result of excess soil salinity, which may be caused by excess land clearing and changes to the groundwater table. Salinity is reported as parts per thousand (ppt).
4. Dissolved Oxygen[^]
DO levels indicate how much oxygen is in the water. Low DO levels indicate an abnormal disturbance in the ecosystem such as an algal bloom. DO is measured in percentage (%).
Low DO: 3.5 mg/L at 26C leads to 100% mortality of *Acipenser oxyrhincus*
2.7 mg/L at 19C leads to 22% mortality of *Acipenser oxyrhincus*
<3.7 mg/L Demersal finfish biomass diminishes
<3.5 mg/L Species richness diminishes
Below 2 mg/L infaunal species migrate to sediment surface and epifaunal species move to better aerated water.
Oxygen is essential for life processes of most aquatic organisms. Many aquatic organisms will suffocate if there is insufficient oxygen in the water.
5. Suspended Solids[@]
Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonably established norm for aquatic life. Total suspended solids (TSS) are non-living (inorganic) such as silt and mud; and organic matter such as animal and plant material found in the water. The presence of large amounts of particles are responsible for creating the murky appearance of dirty water and can quickly kill coral reefs. TSS is measured in milligrams per litre (mg/L).
6. Turbidity
Water clarity (the degree of light penetration) is important as aquatic plants depend on light to photosynthesize and produce oxygen. Large amounts of sediment in a water body can also smother benthic organisms. Suspended solid results are interactive and interdependent with turbidity. Expert interpretation needed. Turbidity is measured as FAU.
7. Enterococci^β
The presence of bacteria Enterococci *sp* is monitored as an indicator of human and animal waste pollution. The higher the numbers of Enterococci bacteria present in a sample, the greater the amount of faecal pollution in the water. Bacteria count is measured in Most Probable Number of Enterococci cells per 100mL of sample (MPN/100mL).
8. Nutrients (Nitrate, Nitrite, Ammonia, Phosphate)
High nutrient concentrations in a water body (eutrophication) may lead to excessive weed and algal growth. Excess nutrients enter a water body through several means, including discharge of treated sewage, storm water, and in run-off from land, for example as fertiliser, animal waste, or decaying plant matter.
9. Chlorophyll-a
Chlorophyll-a is a pigment found in green plants, including aquatic plant. Measuring the amount of chlorophyll-a in the water therefore indicates the amount of green algae present in the water. High concentrations of algae (algal blooms) may harm other aquatic organisms, either through the production of toxins, reduction of available light through covering the water surface, or by using all available oxygen during respiration at night. Chlorophyll-a is measured in micrograms per litre (µg/L).
10. Rainfall
Rarotonga: daily rainfall data is provided by the Cook Islands Meteorological Service.
Aitutaki: daily rainfall data is recorded by MMR Staff (Aitutaki Marine Research Centre – AMRC) at Amuri and by Rowan Strickland at Vaipae.
Rainfall is measured in millimetres (mm) and reported as an average per month, total number of days that had no rainfall and the highest amount of rainfall in 1-day.

[#]EPA Quality Criteria for Water Gold Book 1986

[^]EPA Ambient Aquatic Life Water Quality Criteria for DO (Saltwater): Cape Cod to Cape Hatteras Nov 2000

[@]EPA Quality Criteria for Water Red Book 1976

^βWHO Guidelines on Recreational Water Quality for Coastal and Fresh Waters 2021

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