



FEBRUARY 2026

Gladstone Ports Corporation (GPC) Port of Rockhampton Water Quality Program: 2025 Annual Report

+61 7.4972.7530
Unit 3, 165 Auckland St, Gladstone
PO BOX 1267, GLADSTONE QLD 4680
office@visionenvironment.com.au
www.visionenvironment.com.au

REPORT CONTRIBUTORS

Role	Team member
Project Management	Felicity Melville
Fieldwork	Mark Jensen, Melanie Alpen, Carys Hanning, Ralph Alquezar, Michael Baird, Anthony Cooke, Mike Shanahan
Reporting & Review	Anthony Cooke, Anna Skillington, Felicity Melville

CITATION

This report should be cited as:

Vision Environment (2026). *Port of Rockhampton Water Quality Monitoring Program: 2025 Annual Report*. Vision Environment ANZ, A Trinity Consultants Australia Company, Gladstone, Australia.

DOCUMENT CONTROL

Document draft	Originated by	Edit and review	Date
Draft for internal review	AC	AS	20/02/2026
Draft issued to Client	AC	FM	24/02/2026
Final issued to client	GPC	FM	25/02/2026

DISCLAIMER

Every care is taken to ensure the accuracy of the data and interpretation provided. Trinity Consultants Australia Ptd Ltd trading as Vision Environment ANZ makes no representation or warranties about the accuracy, reliability, completeness or suitability for any particular purpose, and disclaims all responsibility and all liability for all expenses, losses, damages which may be incurred as a result of this product being inaccurate.



FILE REFERENCE

25022026 FINAL GPC PoR Water Monitoring Annual Report 2025 _TCA

EXECUTIVE SUMMARY

Ambient water quality monitoring has been undertaken at the Port of Rockhampton (PoR) since 2014 to establish a robust baseline dataset for comparison with future maintenance dredging campaigns. Monitoring is conducted concurrently with the Port Curtis Integrated Monitoring Program (PCIMP) in Gladstone Harbour to enable direct comparison between programs and ensure methodological consistency.

During 2025, water quality monitoring was undertaken in March, June, August and November at three PoR sites. Parameters assessed included physicochemical parameters, nutrients, chlorophyll *a*, and total and dissolved metal(loid) concentrations. Results were evaluated against the relevant Water Quality Objectives (WQO) for the Fitzroy and Curtis Island Basin and compared with concurrent data from adjacent (Narrows and Western Basin) and reference (Colosseum Inlet and Rodds Bay) PCIMP zones.

Sub-surface physicochemical parameters were generally consistent among PoR sites within individual surveys but exhibited seasonal variation, largely influenced by metocean conditions such as temperature and freshwater inflows. Water pH remained within recommended WQO ranges throughout the year. Dissolved oxygen concentrations frequently exceeded the 80th percentile WQO, indicating well-oxygenated estuarine conditions. In contrast, turbidity and total suspended solids (TSS) commonly exceeded the 80th percentile WQO, reflecting the naturally high suspended sediment environment of the Fitzroy River estuary. The lowest turbidity and TSS concentrations were recorded during the June survey, coinciding with reduced river flow and calmer conditions.

Total nutrient and total metal(loid) concentrations generally mirrored turbidity and TSS patterns, with lower concentrations observed during June when suspended sediment levels were reduced. Exceedances of nutrient WQO, particularly for total phosphorus, were frequent, while only a single exceedance of the 95% species protection Australian Water Quality Guideline (AWQG) was recorded for metals (dissolved zinc). Dissolved nutrient and metal(loid) concentrations were generally comparable to those recorded in adjacent and reference PCIMP zones.

Compared with Port Curtis zones, PoR consistently exhibited significantly higher turbidity, TSS, total nutrients and total metal(loid) concentrations. This pattern has been observed across multiple years of monitoring and is likely attributable to the highly dynamic, sediment-influenced nature of the Fitzroy River estuary and catchment-derived inputs. The elevated suspended sediment environment at PoR enables the transport of particle-associated nutrients and metal(loid)s, contributing to higher total concentrations relative to Port Curtis.

Overall, the 2025 monitoring results are consistent with established baseline conditions at PoR and confirm the strong influence of hydrodynamics and sediment processes on local water quality. The dataset further strengthens the long-term ambient baseline available to support future maintenance dredging assessments.

TABLE OF CONTENTS

1	INTRODUCTION	1
2	METHODOLOGY	1
2.1	MONITORING SITES.....	1
3	RESULTS & DISCUSSION	6
3.1	METOCEAN CONDITIONS	6
3.2	PHYSICOCHEMICAL PARAMETERS	8
3.2.1	<i>PoR</i>	8
3.2.2	<i>Comparison with PCIMP Results</i>	12
3.3	CHLOROPHYLL A AND NUTRIENTS	12
3.3.1	<i>PoR</i>	12
3.3.2	<i>Comparison with PCIMP Results</i>	12
3.4	TOTAL AND DISSOLVED METAL(LOID)S	16
3.4.1	<i>PoR</i>	16
3.4.2	<i>Comparison with PCIMP Results</i>	24
4	SUMMARY	24
5	REFERENCES	25
6	APPENDIX	28

LIST OF TABLES

Table 1 Summary of ambient conditions during water quality sampling undertaken in 2025.	6
Table 2 Mean sub-surface physicochemical parameters measured at PoR sites during the 2025 surveys.....	9
Table 3 Chlorophyll <i>a</i> and nutrient concentrations measured at PoR during the 2025 surveys.	13
Table 4 Total and dissolved metal(loid) concentrations measured at PoR during the 2025 surveys.	17
Table A1 Location of water quality monitoring sites in decimal degrees (WGS84).....	28
Table A2. Summary of project quality objectives.....	30
Table A3 Whole water column physicochemical parameters and TSS at PoR and adjacent and reference PCIMP zones during the 2025 surveys.....	31
Table A4 Chlorophyll <i>a</i> and nutrient concentrations at PoR, and adjacent and reference PCIMP zones during the 2025 surveys.	32
Table A5 Total and dissolved metal(loid) concentrations at PoR, and adjacent and reference PCIMP zones during the 2025 surveys.	33
Table A6 Results of two-way ANOVAs comparing PoR with adjacent and reference PCIMP zones.	36

LIST OF FIGURES

Figure 1 Location of the three monitoring sites for GPC PoR Water Quality monitoring. 2

Figure 2 Location of PCIMP water quality monitoring sites in 2025. 3

Figure 3 Location of PoR sites in comparison with sites in adjacent PCIMP zones (Narrows and Western Basin) and PCIMP reference sites (Colosseum Inlet and Rodds Bay). 4

Figure 4 Rockhampton rainfall, wind conditions, Fitzroy River flow (station 130005A), Calliope River flow (station132001A), and lunar phases during 2025 in relation to water quality surveys. 7

Figure 5 Windrose of daily maximum wind gusts recorded at Rockhampton Airport Station during 2025. 8

Figure 6 Temperature, electrical conductivity, pH and dissolved oxygen at PoR, and adjacent and reference PCIMP zones during each 2025 survey. 10

Figure 7 Turbidity and total suspended solids at PoR, and adjacent and reference PCIMP zones during each 2025 survey. 11

Figure 8 Total phosphorus, FRP, chlorophyll *a* and total nitrogen concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. 14

Figure 9 Mean ammonia, NO_x, TOC and DOC concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. 15

Figure 10 Total and dissolved aluminium and arsenic concentrations at PoR, and adjacent and reference PCIMP zones during each survey. 19

Figure 11 Total chromium and copper, and total and dissolved iron concentrations at PoR, and adjacent and reference PCIMP zones during each survey. 20

Figure 12 Total and dissolved manganese and molybdenum concentrations at PoR, and adjacent and reference PCIMP zones during each survey. 21

Figure 13 Total nickel and total and dissolved vanadium concentrations at PoR, and adjacent and reference PCIMP zones during each survey. 22

Figure 14 Total and dissolved zinc at PoR, and adjacent and reference PCIMP zones during each survey. 23

Figure A1 Depth-profiled physicochemical parameters at all Port of Rockhampton sites during 2025. 29

ACRONYMS

ALS	Australian Laboratory Services
ANOVA	Analysis of Variance
APHA	American Public Health Association
AWQG	Australian Water Quality Guidelines
BOM	Bureau of Meteorology
DEHP	Department of Environment and Heritage Protection (now DES)
DES	Department of Environment and Science
DOC	Dissolved Organic Carbon
DSITIA	Department of Science, Information Technology, Innovation and the Arts, Queensland
FB	Field Blank
FRP	Filterable Reactive Phosphorus
GPC	Gladstone Ports Corporation Ltd
LOR	Limit of Reporting
LSD	Least Significant Difference
LMDMP	Long-Term Maintenance Dredging Management Plan
NMI	National Measurement Institute
NW	Narrows
PCIMP	Port Curtis Integrated Monitoring Program
PoG	Port of Gladstone
PoR	Port of Rockhampton
RB	Rodds Bay
RCI	Reference Colosseum Inlet
QA/QC	Quality Assurance/Quality Control
QWQG	Queensland Water Quality Guidelines
SE	Standard error
TOC	Total Organic Carbon
TSS	Total Suspended Solids
VE	Vision Environment ANZ
WB	Western Basin
WQG	Water Quality Guidelines
WQO	Water Quality Objectives

1 INTRODUCTION

The Port of Rockhampton (PoR) is located within the Fitzroy River delta and is managed by Gladstone Ports Corporation Limited (GPC). Maintenance dredging activities at PoR are guided by the Long-Term Maintenance Dredging Management Plan (LMDMP) (GPCL 2023), which aims to provide a sustainable, long-term approach to dredging management. Although dredging is anticipated to occur at intervals of five years or longer, the most recent dredging campaign at PoR was undertaken in 2011.

Ambient water quality monitoring at PoR sites (Figure 1) has been conducted since 2014 (Vision Environment 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025). This monitoring program establishes a robust baseline dataset to enable comparison with water quality conditions during future dredging campaigns. Quarterly monitoring at PoR is undertaken concurrently with the Port Curtis Integrated Monitoring Program (PCIMP) (Figure 2), with aligned methodologies to enable comparison between PoR and PCIMP datasets, both current and historical.

This annual report presents an overview of the water quality data collected during 2025 and provides a comparison with data from adjacent and reference PCIMP zones (Figure 3).

2 METHODOLOGY

2.1 Monitoring Sites

Monitoring was undertaken by suitably qualified and experienced personnel from Trinity Consultants Australia Pty Ltd (TCA). All works were conducted in accordance with established sampling procedures derived from internationally recognised and nationally adopted standard protocols, including:

- Australian and New Zealand Standards for water quality sampling (AS/NZS 1998a, b, c)
- *Standard Methods for the Examination of Water and Wastewater* (APHA 2017)
- *Australian and New Zealand Water Quality Guidelines* (AWQG) (ANZG 2018, 2021, 2025a, b)
- *Queensland Water Quality Guidelines* (DERM 2009)
- *Monitoring and Sampling Manual* (DES 2018).

A summary of the sampling methodology is provided below:

Activity	Description
Monitoring Sites	<p>Monitoring was undertaken at three sites (PoR1, PoR2 and PoR3), located within a shallow (approximately 4 to 10 m depth) mangrove dominated estuary that is strongly influenced by tidal currents (approximately 0.4 m/s). GPS coordinates are provided in Appendix Table A1.</p> <p>PCIMP zones adjacent to and/or exhibiting similar ambient conditions to the PoR (Figure 2 and 3) included:</p> <ul style="list-style-type: none"> • Narrows (six sites: NW10 to NW60) • Western Basin (six sites: WB10 to WB60). <p>PCIMP Reference zones for comparative assessment included:</p> <ul style="list-style-type: none"> • Colosseum Inlet (four sites: RCI10 to RCI40) • Rodds Bay (three sites: RB10 to RB30).

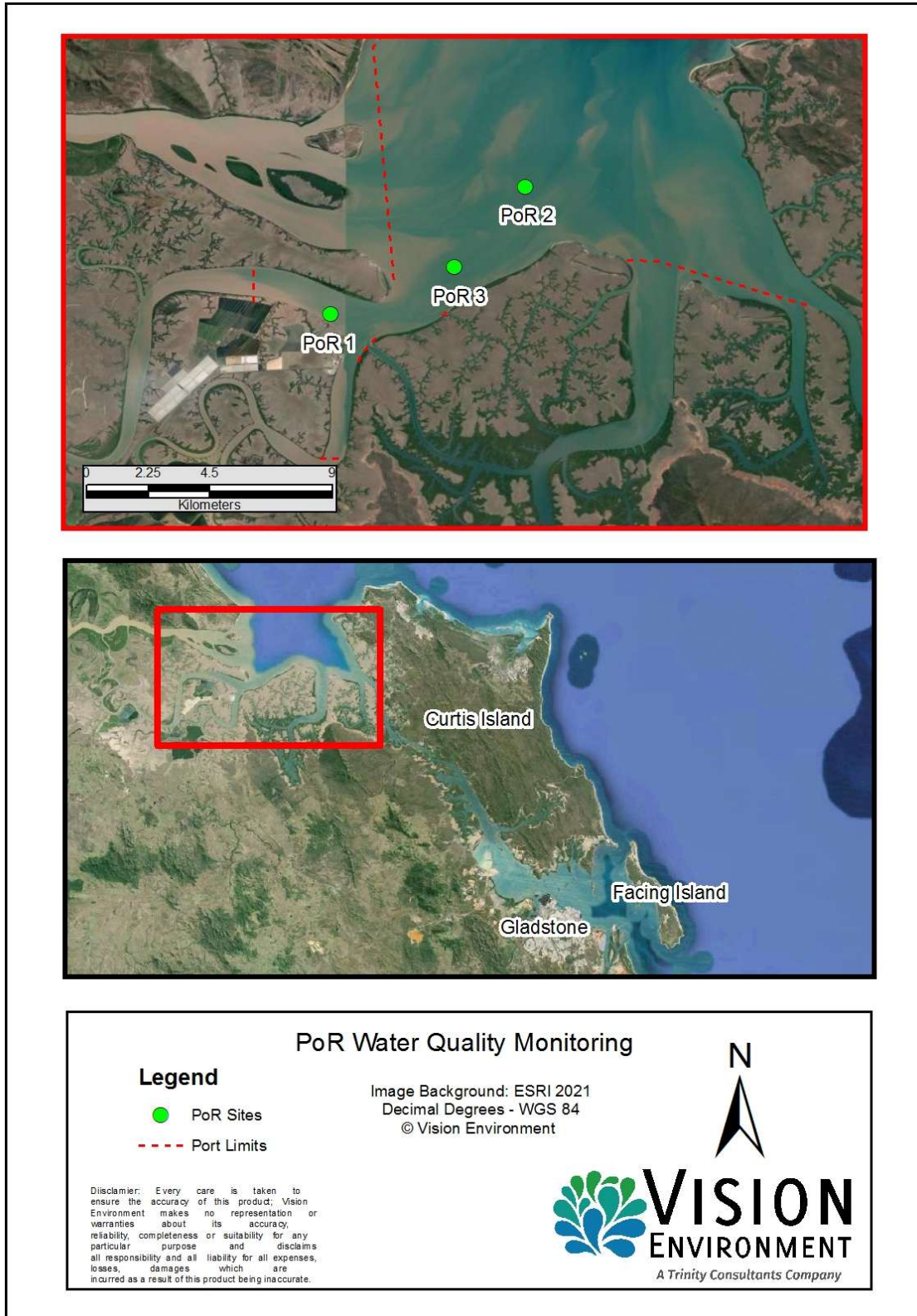
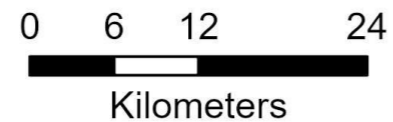
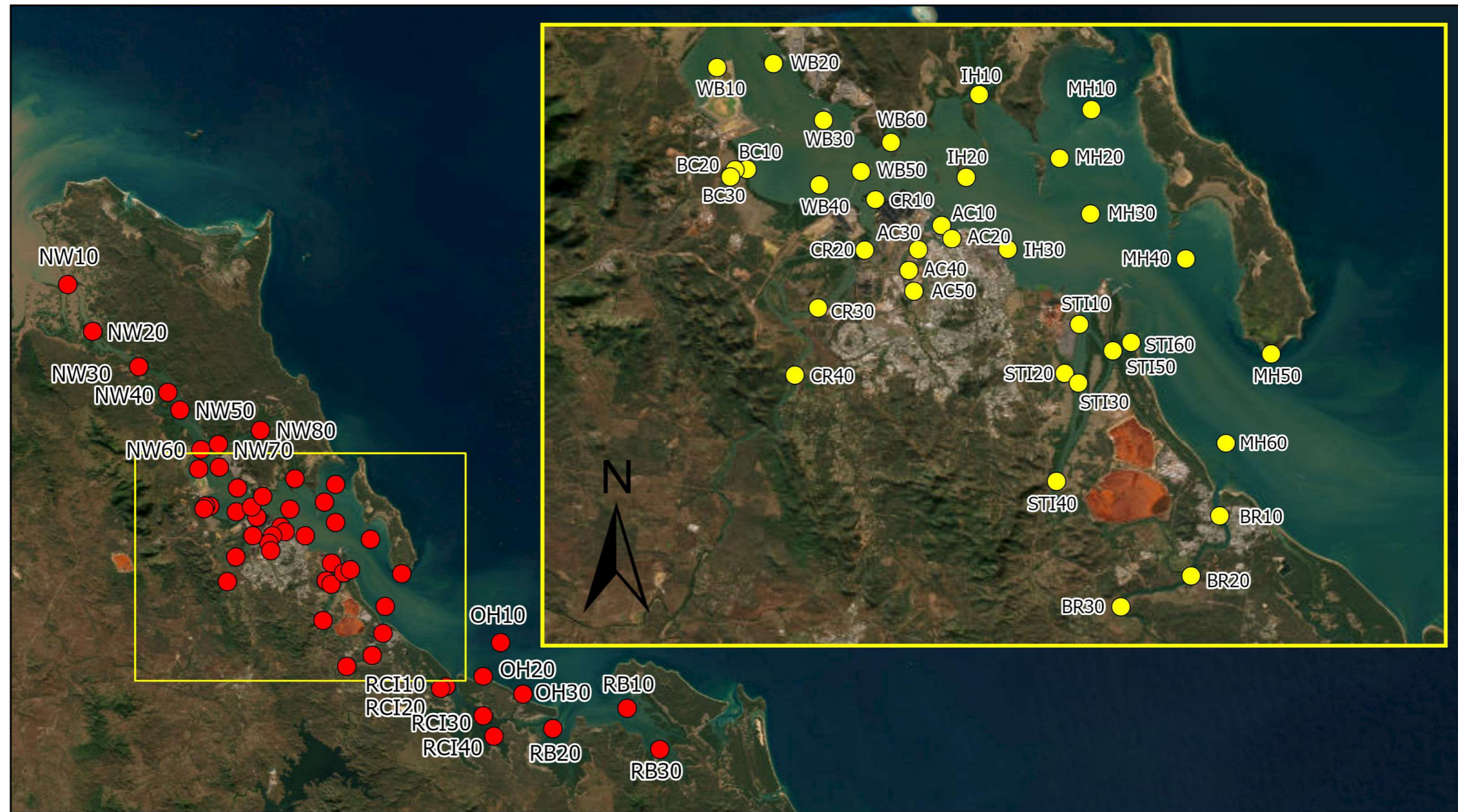


Figure 1 Location of the three monitoring sites for GPC PoR Water Quality monitoring.



● Monitoring Sites

PCIMP Water & Sediment Sites

Image Background ESRI 2023
 Decimal degrees - WGS84
 Vision Environment - All Rights

Disclaimer: Every care is taken to ensure the accuracy of this product; Vision Environment makes no representation or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibilities and all liabilities, losses, damages which are incurred as a result of this product being inaccurate

Figure 2 Location of PCIMP water quality monitoring sites in 2025.

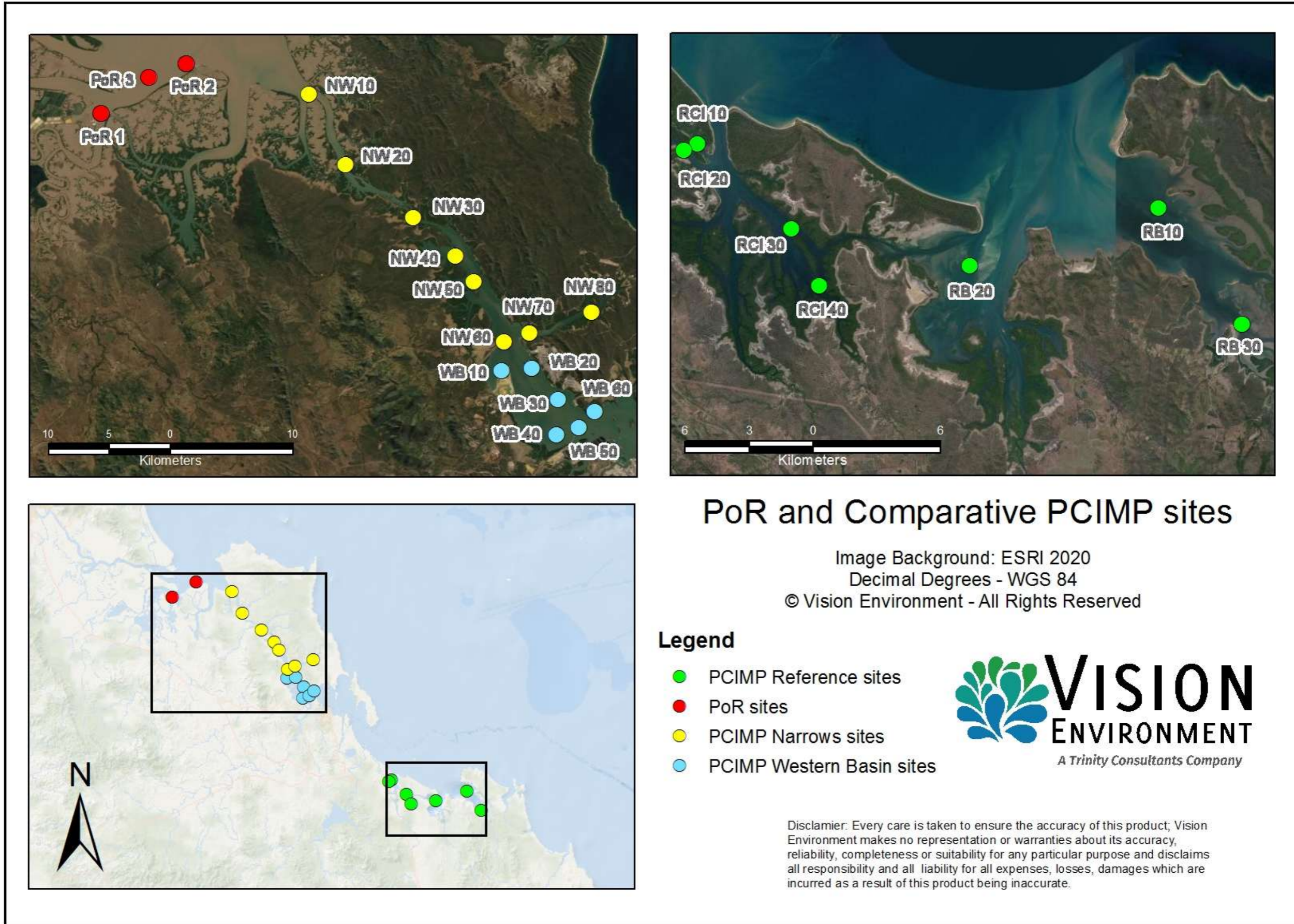


Figure 3 Location of PoR sites in comparison with sites in adjacent PCIMP zones (Narrows and Western Basin) and PCIMP reference sites (Colosseum Inlet and Rodds Bay).

Activity	Description
Monitoring Frequency	REMP surveys were conducted on four occasions in March, June, August and November 2025, aligning with PCIMP monitoring.
<i>In-situ</i> Measurements	<p>Measurements of physicochemical parameters (temperature, electrical conductivity, pH, turbidity and dissolved oxygen) were undertaken <i>in situ</i> using a calibrated YSI ProDSS multiparameter water quality meter. Measurements were undertaken at approximately 0.5 to 1.0 m depth intervals at each site.</p> <p>Concurrent light measurements using a LI-COR LI192 Underwater Quantum sensor to calculate the vertical light attenuation coefficient (Kd) were also undertaken.</p>
Sample Collection	<p>Water samples were collected at the sub-surface (0.5 m depth) using pre-acid washed Nalgene bottles (triple rinsed in Milli-Q and site water) in a Perspex pole sampler. Powder free gloves were worn to avoid contamination.</p> <p>Samples not requiring filtration were decanted directly into the laboratory provided sample bottles.</p> <p>Samples that required filtration were filtered <i>in situ</i> through a 0.45 µm sterile cellulose acetate membrane syringe filter into their respective laboratory provided sample bottles. Each syringe was pre-rinsed in site water and filters were pre-packaged from the supplier.</p> <p>To extend chlorophyll <i>a</i> holding time, samples were filtered within 24 h of collection and filters were stored frozen.</p> <p>Sample bottles were stored cool prior to being sent for analysis at the NATA accredited National Measurement Institute (NMI), Australian Laboratory Services (ALS) and Queensland Health (QH) within recommended holding periods and using appropriate Chain of Custody procedures.</p>
Sample Analysis	<p>The following analyses were undertaken during each survey:</p> <ul style="list-style-type: none"> • Total Suspended Solids (TSS) • Total nutrients (nitrogen and phosphorus) • Dissolved nutrients (ammonia, nitrogen oxides [NOx], and filterable reactive phosphorus [FRP]) • Chlorophyll <i>a</i> • Dissolved and total metal(loid)s (aluminium, arsenic, cadmium, chromium, cobalt, copper, gallium, iron, lead, manganese, mercury, molybdenum, nickel, silver, tin, vanadium and zinc) • Total organic carbon (TOC) and dissolved organic carbon (DOC) <p>Laboratory reports are attached to the end of this report.</p>
Quality Assurance (QA)	<p>A field replicate was collected at one site during each survey, with a Field Blank (FB) for testing potential contamination from field procedures and/or sample bottles also collected.</p> <p>Laboratory QA measures include:</p> <ul style="list-style-type: none"> • Laboratory duplicates • Method Blanks • Laboratory Control samples • Matrix Spike samples <p>Results of the QA/QC program are presented in the Appendix.</p>
Data Analysis	<p>Site and survey means and standard errors were tabulated and plotted.</p> <p>Two-way analyses of variance (ANOVA) and post-hoc tests were undertaken to determine whether there were any significant statistical differences in</p>

Activity	Description
	parameters between zones (including PCIMP zones) or across the 2025 surveys.
Water Quality Objectives (WQO)	<p>Results were compared to local WQO for the Fitzroy Basin (PoR1) and Curtis Island Basin coastal waters (PoR2 and PoR3), and the appropriate zones for the PCIMP sites (EHP 2013, DEHP 2014b).</p> <p>Of note, PCIMP zones Narrows, Colosseum Inlet and Rodds Bay have been classified as slightly disturbed while PoR and Western Basin sites are located in areas considered moderately disturbed. As such, the 95% species protection Australian WQG trigger value was applicable to the PoR and Western Basin sites, while the 99% AWQG was applicable at the other sites (ANZG 2018, 2021, 2025a, b)</p>

3 RESULTS & DISCUSSION

3.1 Metocean Conditions

Table 1 summarises the climatic and metocean conditions experienced immediately prior to, and during, each water quality survey at the PoR sites. Rainfall, wind conditions, Fitzroy and Calliope River flows, and lunar phase patterns for 2025 are presented in Figure 4.

Table 1 Summary of ambient conditions during water quality sampling undertaken in 2025.

Rainfall represents the total amount recorded on the day of sampling during the preceding week. Wind refers to the maximum wind gust recorded on the day of sampling at the Rockhampton Aero Station 039083 (BOM 2025). Fitzroy River (130005A) and Calliope River (132001A) flows represent the discharge rates recorded on the day of PoR sampling (DNRMMRRD 2025a, b).

2025 Survey dates	Rainfall (mm)	Wind & direction (km/h)	Fitzroy flow (m ³ /s)	Calliope flow (m ³ /s)	Tides
10 Mar	16	16 ENE	22	<0.01	Spring tide, full moon on 14 March. Tidal range = 3.82 m
11 Jun	0	24 WSW	5.8	0.1	Spring tide, the day of the full moon. Tidal range = 3.78 m
26 Aug	0	31 E	1.6	0.1	Spring tide with new moon on 23 August. Tidal range = 4.07 m
18 Nov	1	30 SE	13	6.0	Spring tide, new moon on 20 November. Tidal range = 3.96 m

During 2025, approximately 913 mm of rainfall was recorded at Rockhampton Airport BOM station (039083), exceeding the long-term annual average of 802 mm recorded from 1939 to 2025 (BOM 2026). Rainfall was higher during the Wet Season months (January to April and November to December; 718 mm) compared with the Dry Season months (May to October; 195 mm). The highest monthly rainfall totals were recorded in April (175 mm) and March (173 mm), while the lowest totals occurred in September and June (14 mm each).

High flows (> 75.9 m³/s as per DSITI (2017)) in the Fitzroy River were recorded during January, February, March, April and December with a maximum discharge of 2320 m³/s on 10 April (DNRMMRRD 2025b). Baseflow WQO were applicable to all PoR sampling surveys undertaken in 2025.

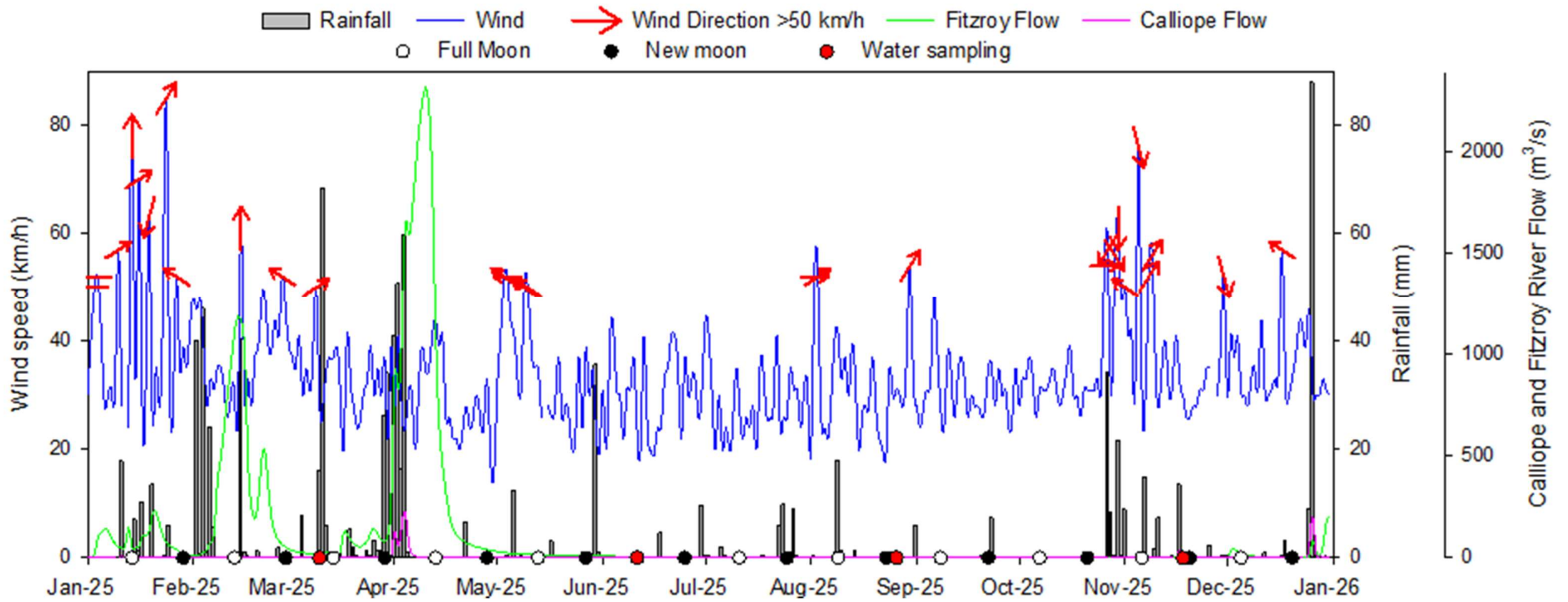


Figure 4 Rockhampton rainfall, wind conditions, Fitzroy River flow (station 130005A), Calliope River flow (station132001A), and lunar phases during 2025 in relation to water quality surveys.

Note: Wind direction arrows indicate the direction toward which the wind was blowing.

Calliope River flows increased following rainfall events during 2025 (DNRMMRRD 2025a) but generally remained within Baseflow conditions ($< 100 \text{ m}^3/\text{s}$) for most of the year. Elevated flows were recorded on 1, 3 and 4 April (132 to $229 \text{ m}^3/\text{s}$) in response to the April rainfall event, and on 26 December ($206 \text{ m}^3/\text{s}$). Baseflow WQOs were therefore applicable to all sampling events undertaken in the Narrows.

Consistent with typical seasonal patterns, winds at Rockhampton during 2025 predominantly originated from the south-east (Figure 5). Approximately 8% of maximum daily wind gusts exceeded 50 km/h (BOM 2025).

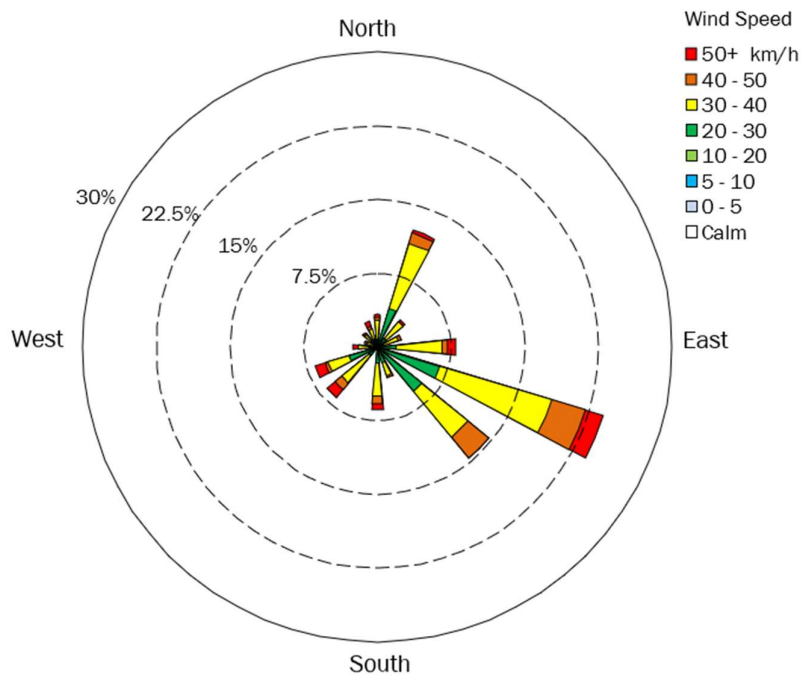


Figure 5 Windrose of daily maximum wind gusts recorded at Rockhampton Airport Station during 2025. Data sourced from BOM (2025). The wind rose illustrates the proportion of wind speeds (indicated by varying colours) originating from different directions.

PoR water quality sampling surveys were generally undertaken during spring tide conditions, with events scheduled within a few days of either the new or full moon. All sampling was conducted at high tide. The maximum tidal range recorded during survey events ranged from 3.78 m in June to 4.07 m in August (Table 1).

3.2 Physicochemical Parameters

3.2.1 PoR

Mean sub-surface (0.5 m depth) values for each physicochemical parameter measured at the PoR sites across the four 2025 surveys are presented in Table 2. Physicochemical depth-profiles are provided in the Appendix (Figure A1).

Results are presented alongside concurrent PCIMP data from adjacent zones (Narrows and Western Basin) and reference zones (Colosseum Inlet and Rodds Bay) in Figures 6 and 7, and Appendix Table A3. Two-way ANOVA results are provided in the Appendix (Table A6).

Table 2 Mean sub-surface physicochemical parameters measured at PoR sites during the 2025 surveys.

Values are means \pm se ($n = 3 - 6$, TSS $n = 1$). WQO ranges shown represent the 20th to 80th percentile values for pH and dissolved oxygen. For turbidity, separate 80th percentile trigger values are provided for the Wet Season (March and November) and Dry Season (June and August). Blue shading indicates values outside the recommended WQO range (DSITI 2017).

* Queensland Water Quality Guidelines (QWQG) value used for comparison for total suspended solids (TSS) (DERM 2009).

Parameter	March 2025			June 2025			August 2025			November 2025			20 th to 80 th WQO
	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	
Temperature (°C)	28.7 \pm 0.0	28.6 \pm 0.0	28.5 \pm 0.0	20.3 \pm 0.0	20.5 \pm 0.0	20.1 \pm 0.0	20.8 \pm 0.0	20.5 \pm 0.0	20.7 \pm 0.0	26.9 \pm 0.0	26.9 \pm 0.0	26.8 \pm 0.0	-
Conductivity (mS/cm)	48.7 \pm 0.0	50.3 \pm 0.0	49.7 \pm 0.0	50.6 \pm 0.0	51.6 \pm 0.0	51.5 \pm 0.0	53.2 \pm 0.0	53.3 \pm 0.0	53.5 \pm 0.0	54.3 \pm 0.0	54.4 \pm 0.0	54.1 \pm 0.0	-
pH	8.1 \pm 0.0	8.0 \pm 0.0	8.0 \pm 0.0	8.0 \pm 0.0	8.1 \pm 0.0	8.1 \pm 0.0	8.0 \pm 0.0	8.0 \pm 0.0	8.1 \pm 0.0	8.0 \pm 0.0	8.0 \pm 0.0	7.9 \pm 0.0	7.2 - 8.3
Dissolved oxygen (% sat.)	96 \pm 0	95 \pm 0	96 \pm 0	98 \pm 0	97 \pm 0	98 \pm 0	95 \pm 0	95 \pm 0	96 \pm 0	95 \pm 0	95 \pm 0	96 \pm 0	87 - 95
Turbidity (NTU)	33 \pm 1	12 \pm 0	21 \pm 0	17 \pm 1	15 \pm 0	12 \pm 2	63 \pm 1	52 \pm 7	29 \pm 0	56 \pm 1	27 \pm 1	49 \pm 1	W = 30 D = 12
TSS (mg/L)	51	17	31	29	32	17	78	56	20	77	31	94	20*

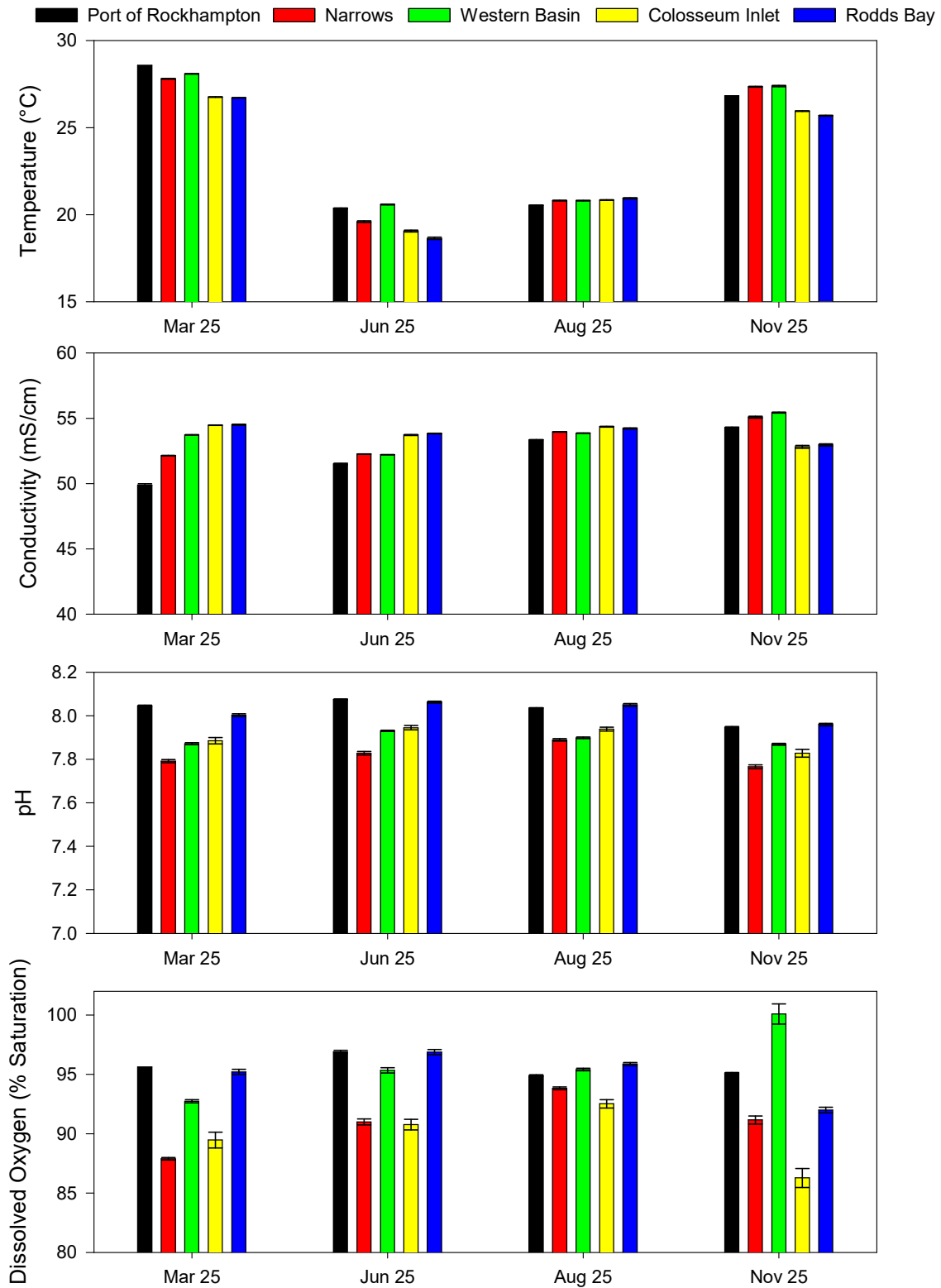


Figure 6 Temperature, electrical conductivity, pH and dissolved oxygen at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 65 to 175).

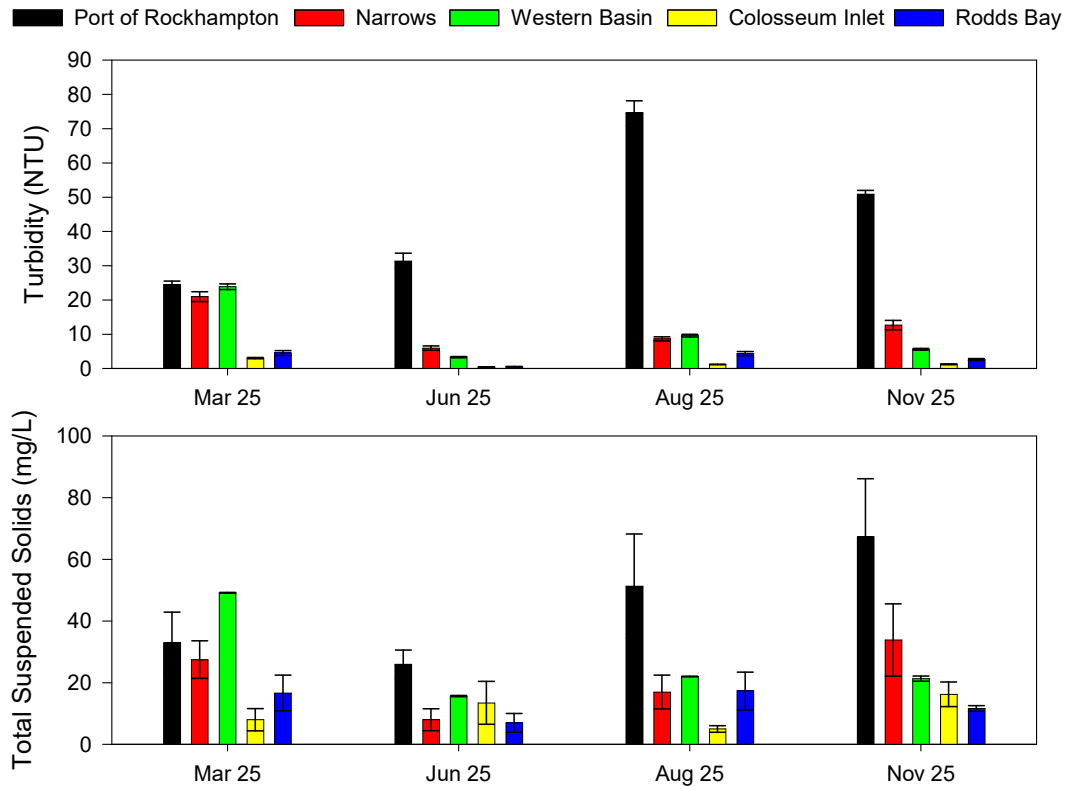


Figure 7 Turbidity and total suspended solids at PoR, and adjacent and reference PCIMP zones during each 2025 survey.

Values are means \pm se ($n = 3$ to 175).

Sub-surface physicochemical parameters were generally consistent among PoR sites within individual surveys but varied between survey events. Clear seasonal patterns were evident, with higher temperatures recorded during the Wet Season surveys in March and November (28.6°C and 26.8°C, respectively), and lower temperatures during the Dry Season surveys in June and August (19.7°C and 20.8°C, respectively). Sub-surface pH remained stable throughout the year, ranging from 7.9 to 8.1 (Table 2).

Electrical conductivity was lower in March and June (49 to 50 mS/cm) compared with the subsequent 2025 surveys (51 to 54 mS/cm). This reduction likely reflects increased freshwater input associated with elevated Fitzroy River flows in February (up to 1,189 m³/s), contributing to dilution of marine waters. Dissolved oxygen concentrations ranged from 95% to 98% saturation across surveys, with most values exceeding the 80th percentile WQO of 95%, indicating consistently well-oxygenated conditions.

Sub-surface turbidity varied among sites within each survey, with no consistent spatial trend observed. Exceedances of the 80th percentile WQO occurred at each site during most surveys, except at PoR2 in March and November and at PoR3 in March and June. TSS concentrations mirrored turbidity patterns, ranging from 17 to 94 mg/L, with most results exceeding the QWQG value of 20 mg/L.

Vertical profiles indicated that most physicochemical parameters were relatively uniform with depth (Appendix Figure A1). Dissolved oxygen occasionally declined slightly towards the seabed, likely reflecting reduced photosynthetic activity under lower light conditions. Turbidity commonly increased near the benthos, consistent with sediment resuspension processes.

3.2.2 Comparison with PCIMP Results

PoR physicochemical parameters were compared with adjacent PCIMP monitoring zones (Narrows and Western Basin) and reference zones (Colosseum Inlet and Rodds Bay) (Figures 6 and 7). Key findings are summarised below:

- Water temperatures at PoR (annual mean of 24.3°C) were significantly higher ($P < 0.05$) than all other zones (22.9 to 24.3°C).
- Electrical conductivity at PoR (52.3 mS/cm) was significantly lower ($P < 0.05$) than in all other zones (53.1 to 53.9 mS/cm).
- The pH at PoR (8.0) was comparable to Rodds Bay and significantly higher ($P < 0.05$) than values recorded in the Narrows, Western Basin and Colosseum Inlet (7.9).
- Dissolved oxygen at PoR (96% saturation) was similar to the Western Basin and significantly higher ($P < 0.05$) than the remaining zones (90 to 95% saturation).
- Turbidity and TSS at PoR (46 NTU and 44 mg/L, respectively) were significantly higher ($P < 0.05$) than in all other zones (1 to 14 NTU, and 11 to 27 mg/L, respectively).

3.3 Chlorophyll a and Nutrients

3.3.1 PoR

Chlorophyll *a* and nutrient results for 2025 are summarised in Table 3. Results are presented alongside concurrent PCIMP data from adjacent and reference zones in Figures 8 and 9, and Appendix Table A4. Two-way ANOVA results are provided in Appendix Table A6.

Several nutrients, particularly total phosphorus and total nitrogen, were lower during the June survey, coinciding with the lowest turbidity and TSS concentrations recorded for the year. This pattern may reflect reduced nutrient inputs from benthic sediment resuspension, suggesting that sediment–water nutrient flux processes contribute to elevated nutrient concentrations under higher turbidity conditions, as documented in other estuarine systems (Prastka et al. 1998, McKee et al. 2000).

Exceedances of the WQO for total phosphorus were frequent across surveys, whereas only three exceedances of the total nitrogen WQO were recorded at PoR sites during 2025. Exceedances were also commonly observed for the readily bioavailable nutrient fractions, FRP and NO_x. In contrast, no exceedances of the WQO were recorded for ammonia, and chlorophyll *a* exceeded WQO on only two occasions.

The highest concentrations of TOC and DOC were recorded during the June and March surveys.

3.3.2 Comparison with PCIMP Results

Comparison of PoR nutrient and chlorophyll *a* concentrations with adjacent (Narrows and Western Basin) and reference (Colosseum Inlet and Rodds Bay) PCIMP zones identified the following patterns:

Table 3 Chlorophyll *a* and nutrient concentrations measured at PoR during the 2025 surveys.

N = 1. Highlighted values indicate exceedances of the 80th percentile WQO (DSITI 2017). FRP = filterable reactive phosphorus; NOx = nitrogen oxides; TOC = total organic carbon; DOC = dissolved organic carbon.

Parameter (µg/L)	March 2025			June 2025			August 2025			November 2025			WQO
	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	
Total Phosphorus	52	30	36	39	35	27	62	82	38	67	35	54	29
FRP	15	11	9	15	10	11	10	10	8	12	11	10	7
Total Nitrogen	230	180	200	210	190	160	220	250	170	240	170	210	220
Ammonia	3	4	5	4	3	3	3	3	7	<2	<2	<2	10
NOx	9	9	11	38	26	21	17	23	57	40	38	31	9
Chlorophyll <i>a</i>	2.3	1.5	0.9	1.4	1.3	1.8	2.2	1.2	1.1	1.9	1.5	1.9	2
TOC (mg/L)	3.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0	1.0	2.0	2.0	20	-
DOC (mg/L)	2.3	1.7	1.7	2.2	1.8	1.8	0.9	1.0	0.9	1.0	1.0	1.0	-

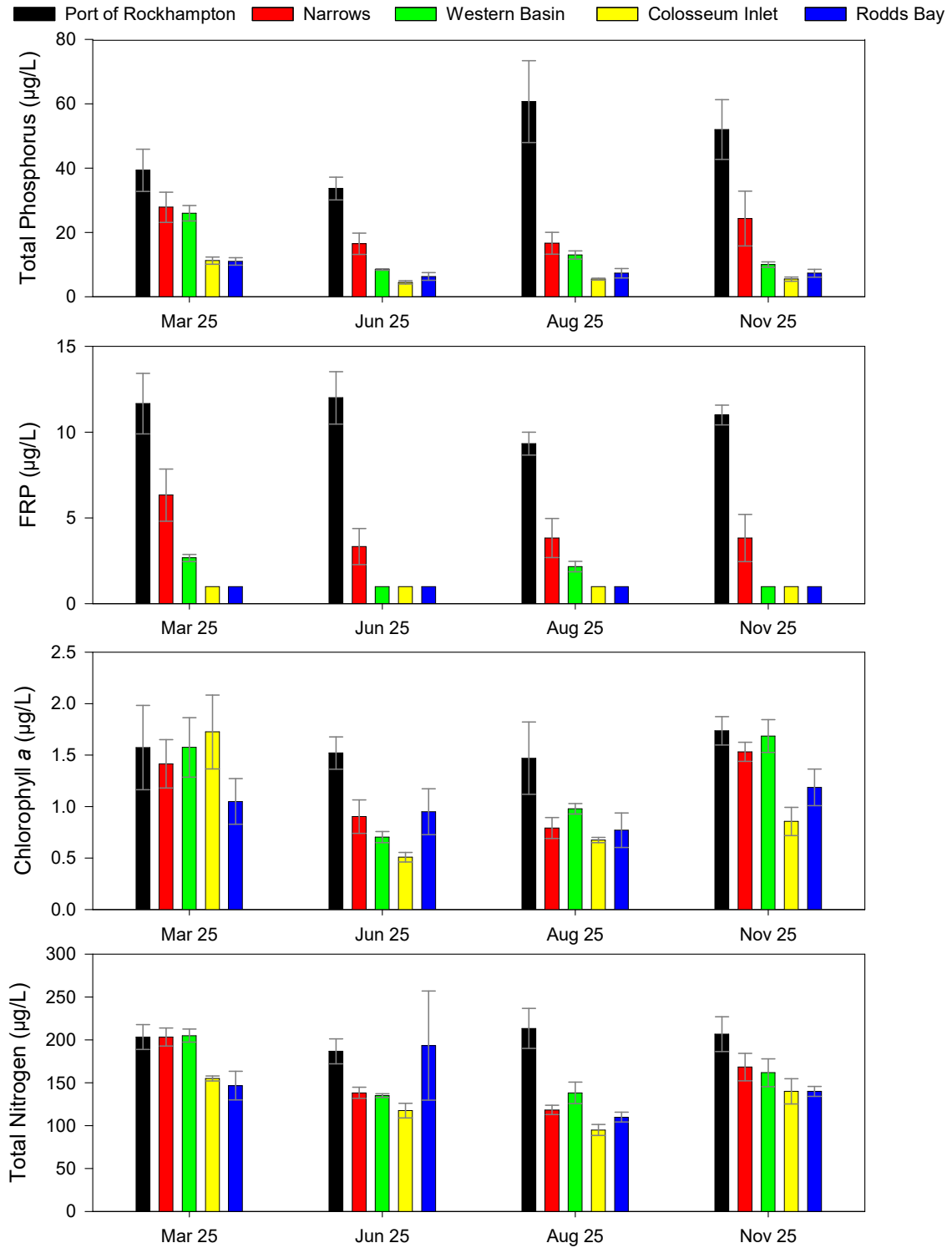


Figure 8 Total phosphorus, FRP, chlorophyll a and total nitrogen concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

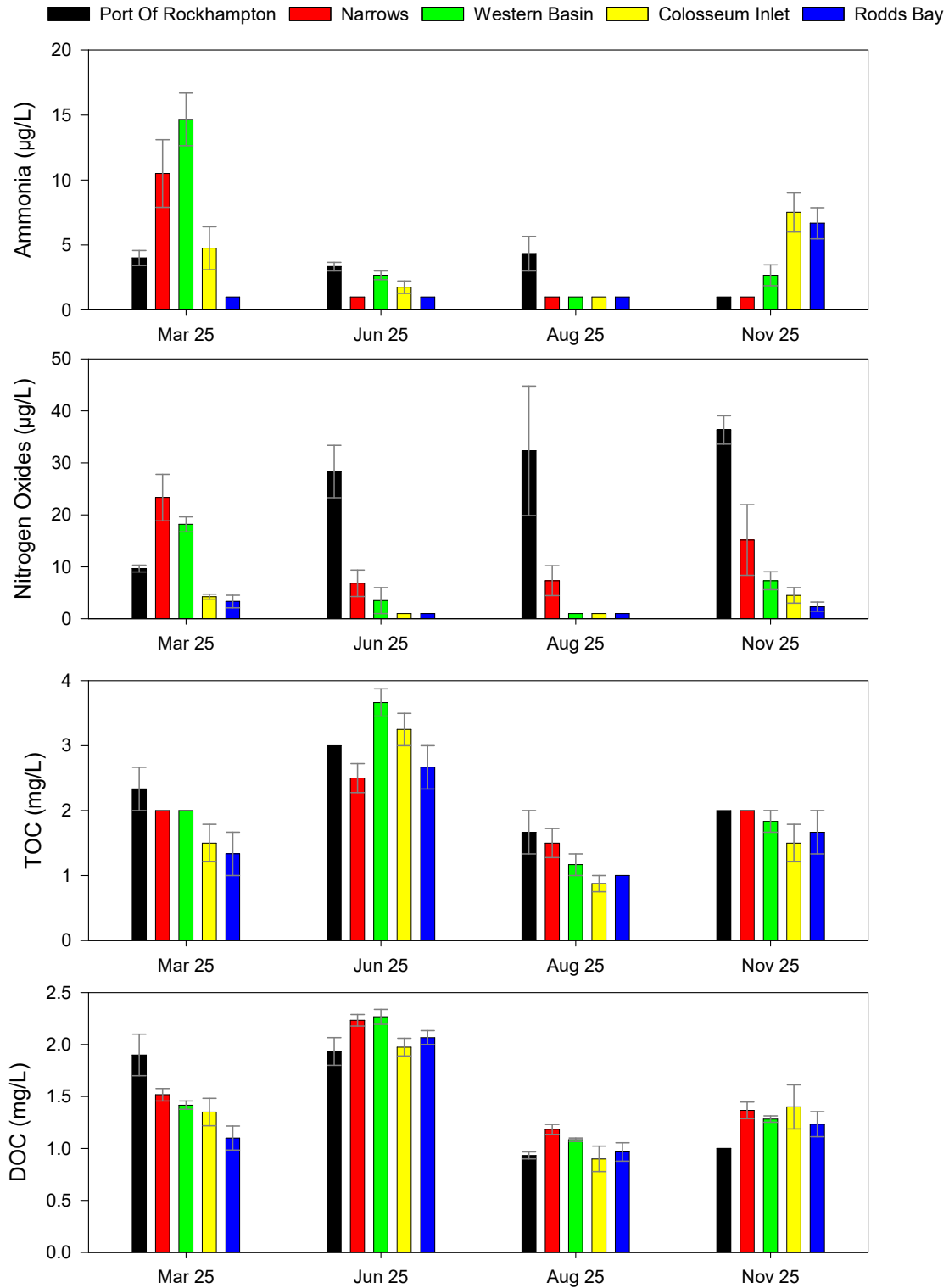


Figure 9 Mean ammonia, NOx, TOC and DOC concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

- Concentrations of total phosphorus and FRP at PoR (annual means of 46 µg/L and 11 µg/L, respectively) were significantly higher ($P < 0.05$) than all other zones (7 to 21 µg/L, and <2 to 4 µg/L).
- Concentrations of total nitrogen and NO_x at PoR (203 µg/L and 27 µg/L, respectively) were significantly higher ($P < 0.05$) than in all other zones (131 to 163 µg/L, and 2 to 13 µg/L).
- Ammonia concentrations at PoR (3 µg/L) were comparable to Rodds Bay, Narrows and Colosseum Inlet (3 to 4 µg/L) all of which were significantly lower ($P < 0.05$) than the Western Basin (5 µg/L).
- PoR TOC concentrations (2.3 mg/L) were significantly higher ($P < 0.05$) than Colosseum Inlet and Rodds Bay (1.7 to 1.8 mg/L), but comparable to the Narrows and Western Basin.
- Concentrations at DOC at PoR were similar to those recorded at Rodds Bay and Colosseum Inlet (1.3 to 1.4 mg/L).
- PoR chlorophyll *a* concentrations (1.6 mg/L) were significantly higher ($P < 0.05$) than in all other zones (0.9 to 1.2 mg/L).

Elevated nutrient concentrations at PoR relative to the broader Port Curtis region have been consistently recorded over multiple years of monitoring (Vision Environment 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025). The comparatively higher nutrient levels at PoR, are likely influenced by differences in dominant land use and anthropogenic inputs (predominantly agricultural in the Fitzroy catchment compared with more industrial influences in Port Curtis), as well as enhanced sediment–water nutrient flux associated with sediment resuspension processes.

3.4 Total and Dissolved Metal(loid)s

3.4.1 PoR

Total and dissolved metal(loid) concentrations recorded at PoR during 2025 are presented in Table 4. These results, together with concurrent PCIMP data from adjacent and reference zones, are shown in Figures 10 to 14 and Appendix Table A5. Two-way ANOVA results are provided in Appendix Table A6.

Total and dissolved copper results are not reported for the June, August and November 2025 surveys due to recurring anomalous concentrations (Vision Environment 2026). Following the November survey, a formal investigation was undertaken by NMI.

The NMI investigation identified low-level copper contamination associated with sample bottles supplied after a change in bottle supplier in March 2025. Testing of unused bottles confirmed measurable copper contamination (>1 µg/L) in several blanks. The root cause was attributed to bottle contamination (specifically dust within uncapped bottles), rather than laboratory analytical processes.

Revised bottle preparation procedures were implemented by NMI in 2026, including immediate capping upon opening, preparation in a cleaner environment, and batch verification testing prior to distribution. Subsequent testing confirmed metal concentrations below the LOR. The full NMI investigation report (CAR2724) is provided in the Appendix for reference.

Table 4 Total and dissolved metal(loid) concentrations measured at PoR during the 2025 surveys.

N = 1. Blue shading indicates exceedances of the 95% species protection AWQG applicable to PoR sites. Chromium speciation was not undertaken; therefore, individual contributions of Cr(III) and Cr(VI) to total chromium concentrations are unknown. Note: Copper data are not presented for the June to November 2025 surveys due to sample bottle contamination identified during a 2025 investigation.

Metal (µg/L)		March 2025			June 2025			August 2025			November 2025			95% AWQG
		PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	
Aluminium	Dissolved	<5	<5	<5	7	8	<5	6	6	5	<5	5	<5	37
	Total	2490	990	1540	1260	820	650	5350	7630	3360	3550	1320	3160	-
Arsenic	Dissolved	1.5	1.5	1.6	1.2	1.3	1.3	1.1	1.1	1.1	1.1	1.2	1.2	-
	Total	2.1	1.8	1.9	1.7	1.7	1.4	2.2	2.7	1.9	2.2	1.5	2.2	-
Cadmium	Dissolved	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.5
	Total	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Chromium	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Cr (III) 27.4 Cr (VI) 4.4
	Total	3.7	1.8	2	<1	<1	1.6	5.3	8.2	2.2	5.7	2.3	4.4	-
Cobalt	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1
	Total	<1	<1	<1	<1	<1	<1	1.4	1.8	<1	1.4	<1	1.2	-
Copper	Dissolved	<1	<1	<1	-	-	-	-	-	-	-	-	-	1.4
	Total	1.9	1.2	1.4	-	-	-	-	-	-	-	-	-	-
Gallium	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-
	Total	<1	<1	<1	<1	<1	<1	1.5	1.7	<1	<1	<1	<1	-
Iron	Dissolved	<5	5	<5	<5	<5	7.6	<5	7.4	5.3	7.5	<5	<5	-
	Total	1960	750	1190	1220	990	570	2980	3950	1740	2840	1140	2330	-
Lead	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	4.4
	Total	<1	<1	<1	<1	<1	<1	1.1	1.5	<1	<1	<1	1	-

Metal (µg/L)		March 2025			June 2025			August 2025			November 2025			95% AWQG
		PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	PoR1	PoR2	PoR3	
Manganese	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-
	Total	31	12	18	20	17	10	49	65	27	56	19	43	-
Mercury	Dissolved	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.4
	Total	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Molybdenum	Dissolved	10	10	10	11	11	11	11	11	11	11	11	12	-
	Total	9.8	10	9.9	11	11	11	11	11	11	11	11	11	-
Nickel	Dissolved	1.0	1.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	70
	Total	3.7	1.6	9.3	2.5	2.1	1.7	6	7.2	3.4	5.8	2.2	4.5	-
Silver	Dissolved	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.4
	Total	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-
Tin	Dissolved	<1	<1	<1	<1	<1	<1	1.0	1.1	<1	<1	<1	<1	-
	Total	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-
Vanadium	Dissolved	2.9	2.9	3	2	1.9	1.9	1.8	1.7	1.7	2.2	2.1	2.0	100
	Total	6.1	4.0	4.8	5	3.8	3.4	8.8	11	6.2	8.2	4.3	6.4	-
Zinc	Dissolved	2.5	9.2	2.1	1.8	2.4	2.5	1.2	2.5	1.9	2.0	1.6	2.4	8
	Total	3.3	2.0	2.2	2.4	1.5	1.3	9.3	9.1	4.5	5.9	3.8	6.9	-

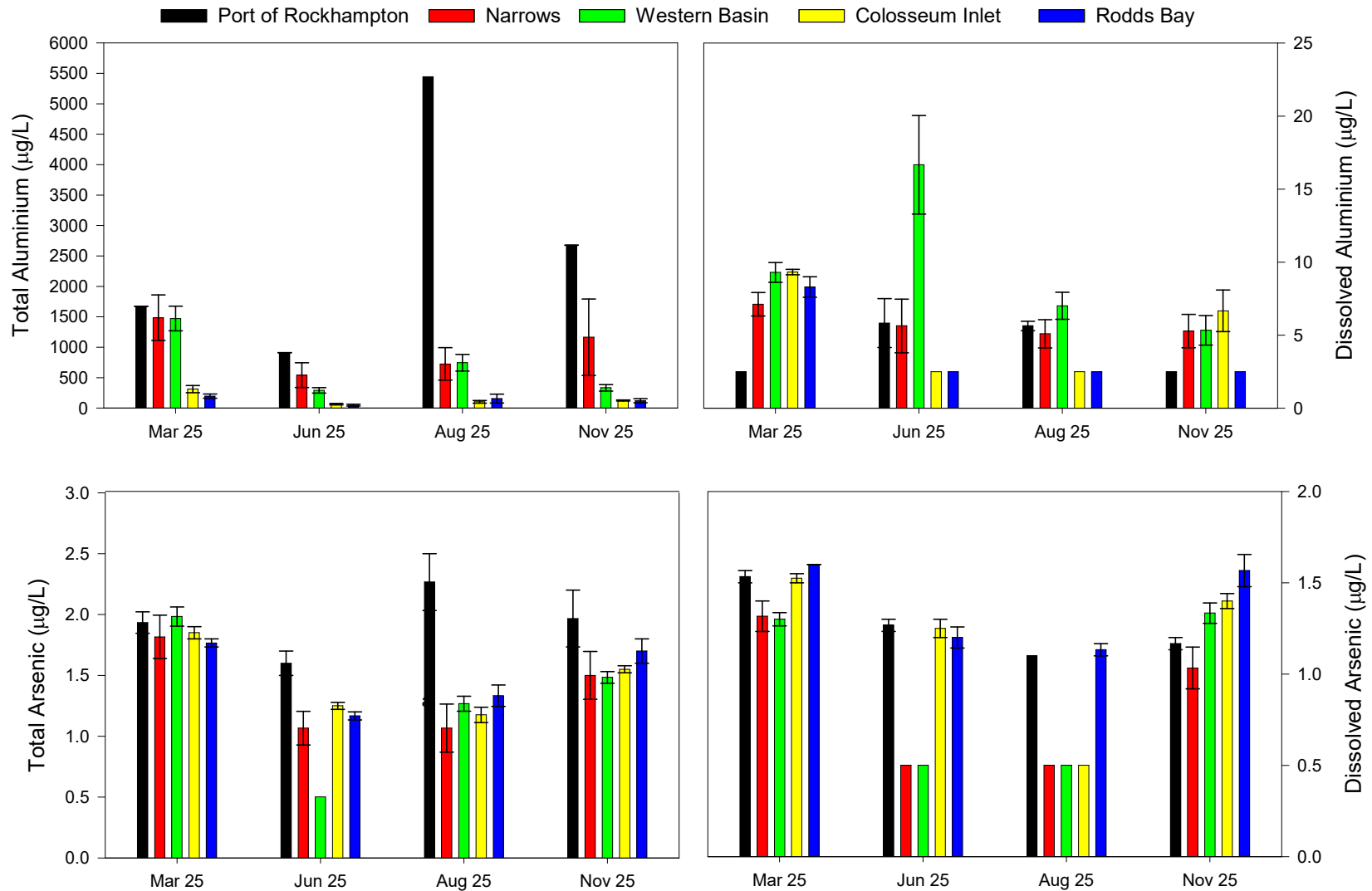


Figure 10 Total and dissolved aluminium and arsenic concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

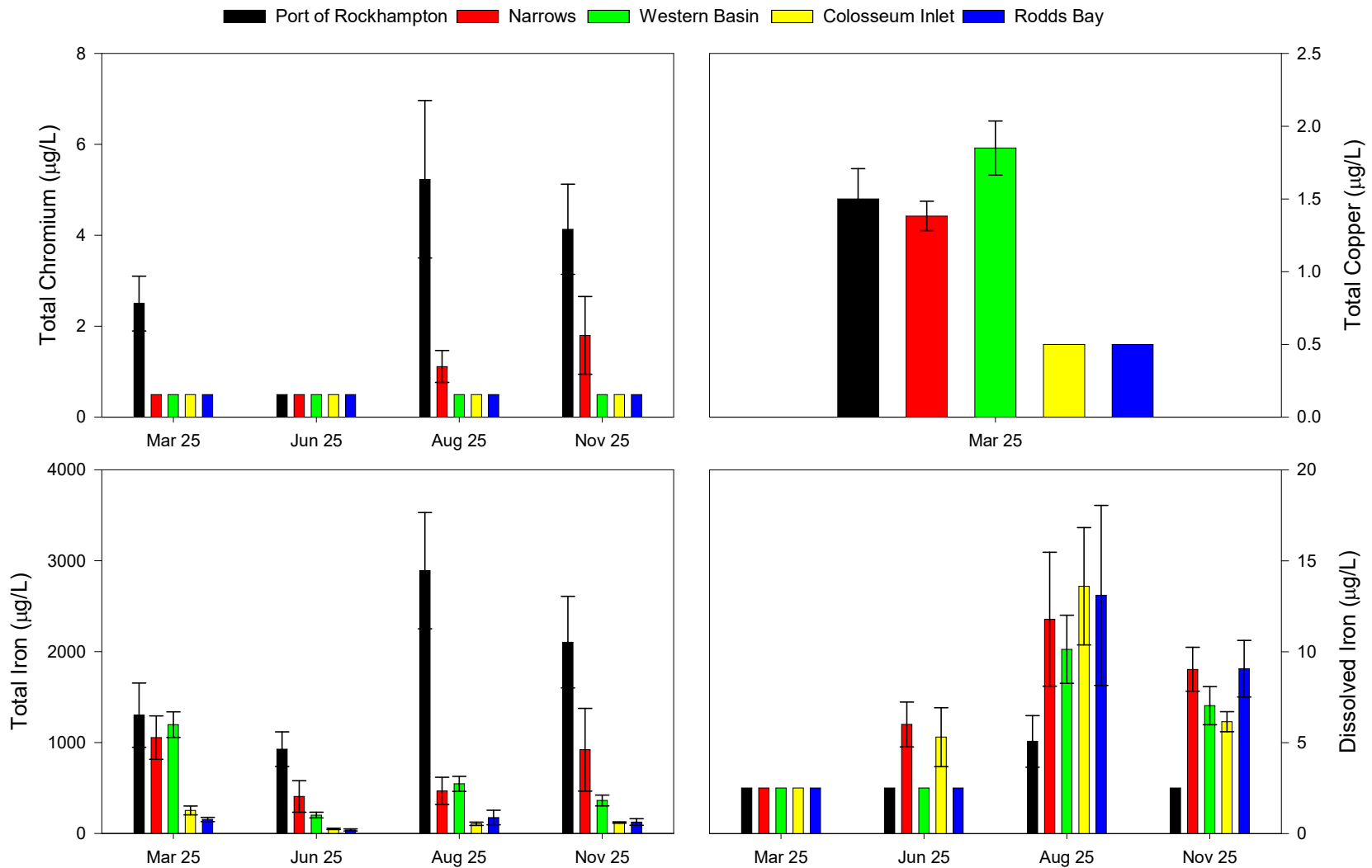


Figure 11 Total chromium and copper, and total and dissolved iron concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes. Note: copper data are not presented for the June to November surveys due to sample bottle contamination identified during a 2025 investigation.

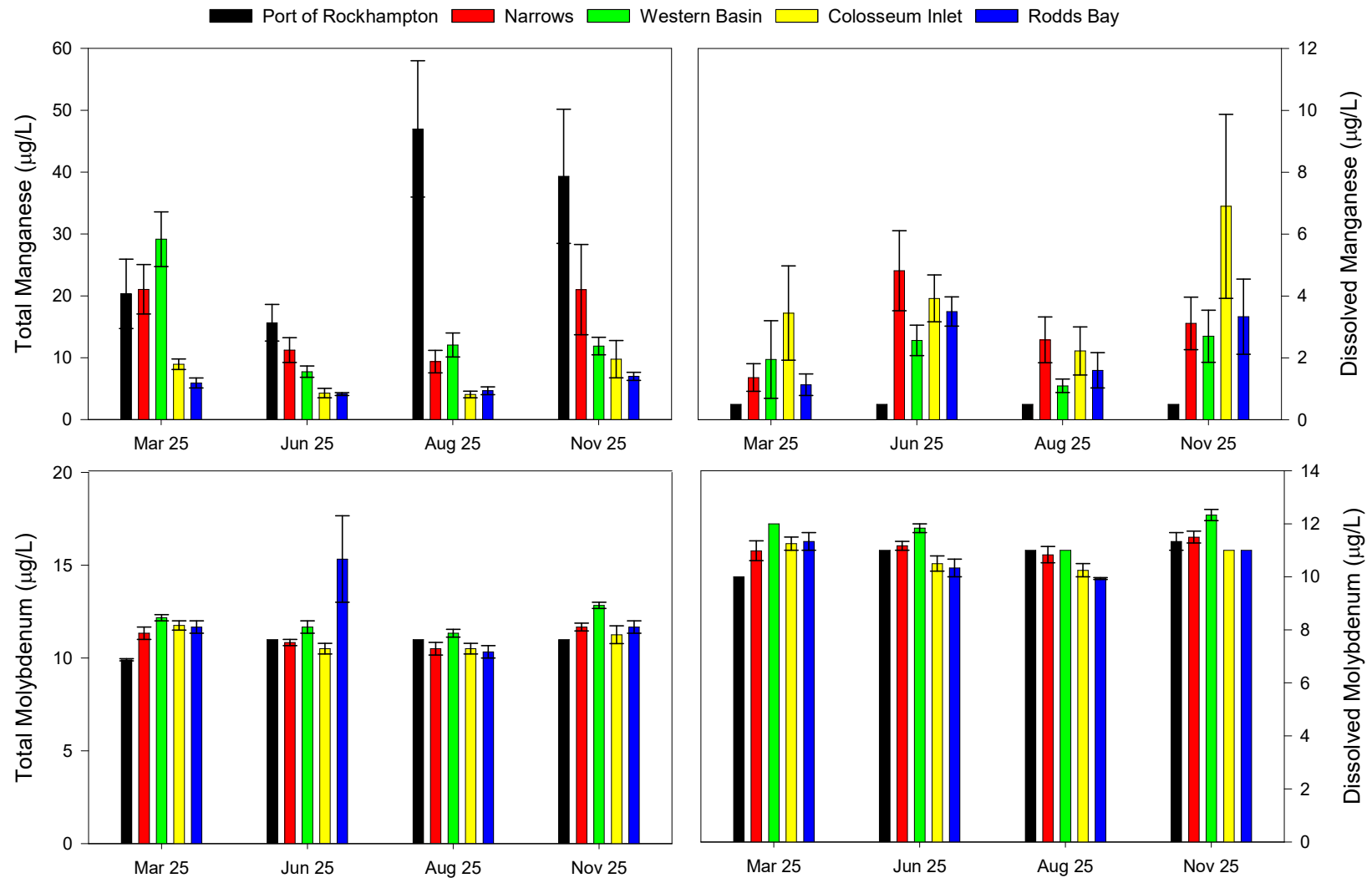


Figure 12 Total and dissolved manganese and molybdenum concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

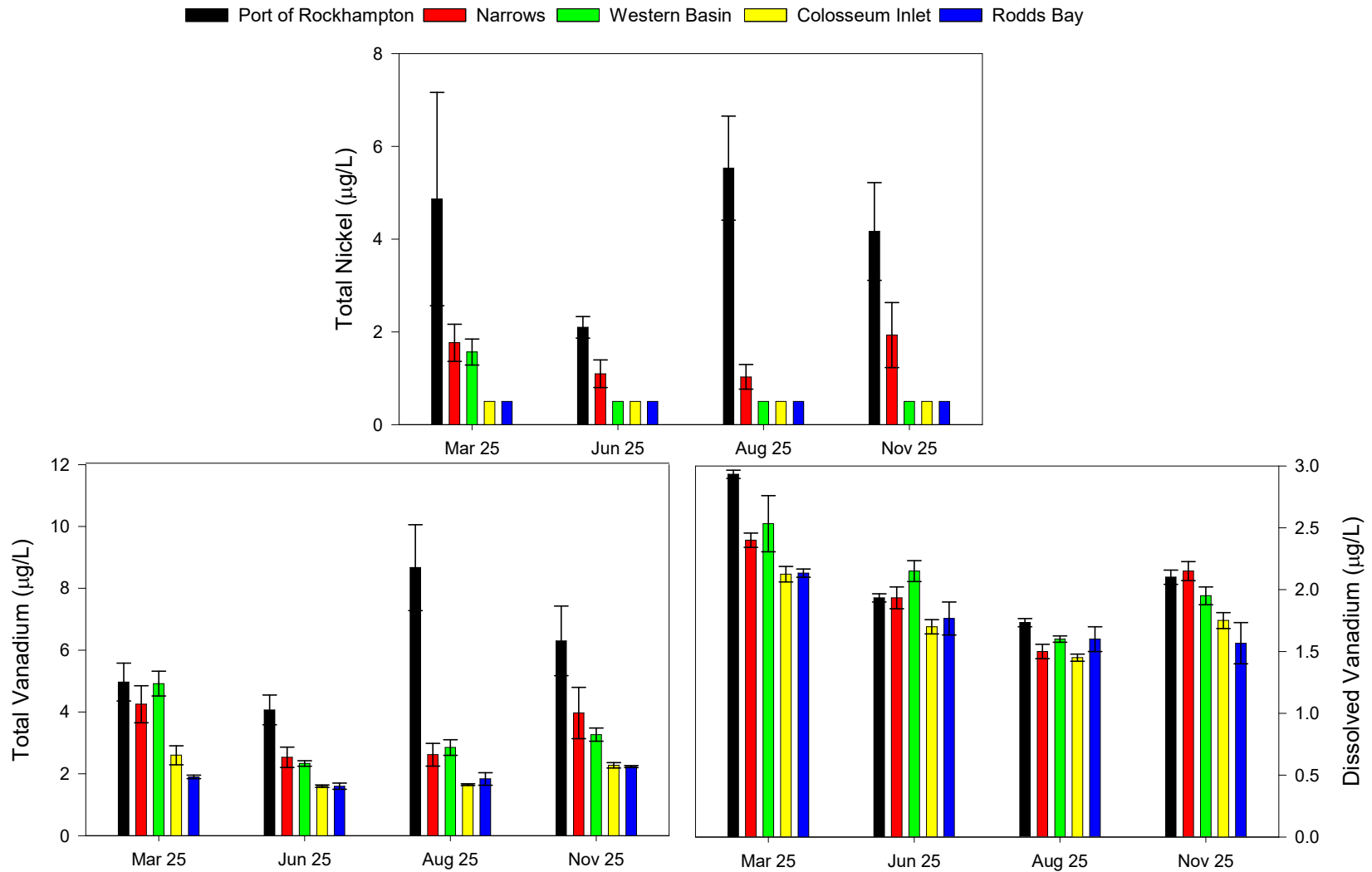


Figure 13 Total nickel and total and dissolved vanadium concentrations at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means \pm se ($n = 3$ to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

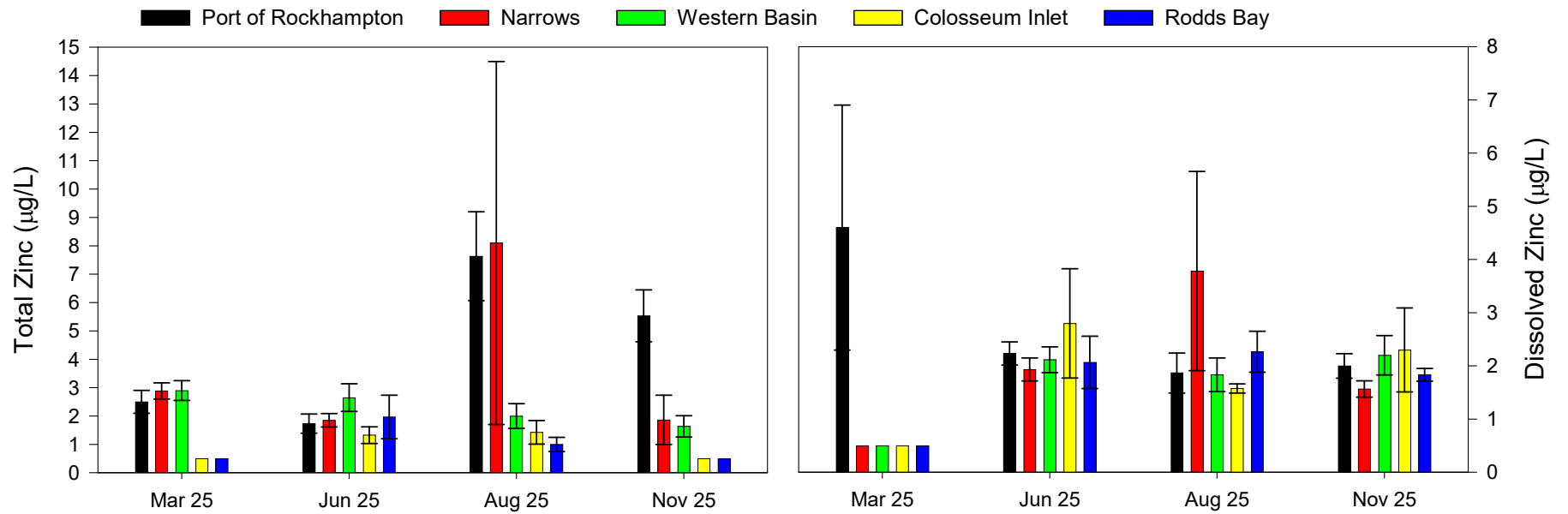


Figure 14 Total and dissolved zinc at PoR, and adjacent and reference PCIMP zones during each 2025 survey. Values are means ± se (n = 3 to 6). For concentrations below LOR, half the LOR value was used for plotting purposes.

Many metal(loid)s were at or below LOR during 2025, including total and dissolved cadmium, mercury, silver and tin. Dissolved chromium, cobalt, gallium, lead and manganese were also below LOR, although total concentrations were detectable.

Consistent with patterns observed for several nutrients, concentrations of total aluminium, arsenic, chromium, iron, manganese, nickel, vanadium and zinc were lower during the June survey, coinciding with reduced turbidity and TSS. Metal(loid) ions also preferentially adsorb to suspended particulates and organic matter (Simpson et al. 2013).

Only one exceedance of the 95% AWQG was recorded at PoR during 2025. Dissolved zinc (9.2 µg/L) at PoR2 in March exceeded the guideline value of 8 µg/L.

3.4.2 Comparison with PCIMP Results

Comparison of total and dissolved metal(loid) concentrations at PoR with adjacent (Narrows and Western Basin) and reference (Colosseum Inlet and Rodds Bay) PCIMP zones identified the following patterns:

- Total aluminium (2,677 µg/L), arsenic (1.9 µg/L), chromium (3 µg/L), iron (1,805 µg/L), manganese (31 µg/L), nickel (4.2 µg/L) and vanadium (6.0 µg/L) were significantly higher ($P < 0.05$) at PoR than at all other zones.
- Total molybdenum (11 µg/L) was significantly lower ($P < 0.05$) at PoR, Colosseum Inlet and the Narrows compared with the Western Basin and Rodds Bay (12 µg/L).

Elevated total metal(loid) concentrations at PoR relative to the broader Port Curtis region have been consistently observed over multiple years of monitoring (Vision Environment 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025). The higher total metal(loid) concentrations at PoR are likely attributable to the greater suspended sediment loads characteristic of the estuarine environment, as many metals preferentially associate with particulate matter. In contrast, dissolved metal(loid) concentrations were generally comparable between PoR and Port Curtis zones.

4 SUMMARY

Water quality monitoring undertaken at PoR during 2025 demonstrated clear seasonal patterns and consistently elevated turbidity, suspended solids, nutrients and total metal(loid) concentrations relative to adjacent and reference PCIMP zones.

Physicochemical parameters such as temperature, pH and dissolved oxygen were within expected seasonal ranges and generally indicative of well-oxygenated estuarine conditions, while electrical conductivity reflected periods of freshwater influence from the Fitzroy River.

Nutrient concentrations, particularly total phosphorus, total nitrogen and bioavailable fractions, were frequently higher at PoR compared with Port Curtis zones, consistent with historical monitoring and likely influenced by catchment inputs and sediment resuspension processes. Similarly, total metal(loid) concentrations were elevated at PoR, reflecting the high suspended sediment environment, although dissolved fractions were generally comparable to Port Curtis zones and AWQG exceedances were limited.

Overall, the 2025 dataset aligns with established baseline conditions for PoR and reinforces the strong influence of hydrodynamics and sediment processes on local water quality.

5 REFERENCES

ANZG. 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australia.

ANZG. 2021. Toxicant default guideline values for aquatic ecosystem protection: Zinc in marine water. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australia.

ANZG. 2025a. Toxicant default guideline values for aquatic ecosystem protection: Aluminium in marine water. Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australia.

ANZG. 2025b. Toxicant default guideline values for aquatic ecosystem protection: Copper in marine water. Australian and New Zealand Governments and Australian state and territory governments, Canberra, Australia.

APHA. 2017. Standard Methods for the Examination of Water and Wastewater. 21st edition. American Public Health Association, Washington, USA.

AS/NZS. 1998a. 5667.1:1998 Water Quality - Sampling. Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples. Joint Standards Australia/Standards New Zealand, Canberra, Australia.

AS/NZS. 1998b. 5667.4:1998 Water Quality - Sampling. Part 4: Guidance on sampling from lakes, natural and man-made. Joint Standards Australia/Standards New Zealand, Canberra, Australia.

AS/NZS. 1998c. 5667.6:1998 Water Quality - Sampling. Part 6: Guidance on sampling of rivers and streams. Joint Standards Australia/Standards New Zealand, Canberra, Australia.

BOM. 2025. Climate statistics for Australian locations. Bureau of Meteorology, Commonwealth of Australia, Canberra, Australia.

BOM. 2026. Climate statistics for Australian locations. Bureau of Meteorology, Commonwealth of Australia, Canberra, Australia.

DEHP. 2014a. Curtis Island, Calliope River and Boyne River Basins Environmental Values and Water Quality Objectives. Department of Environment and Heritage Protection, Brisbane, Australia.

DEHP. 2014b. Environmental Protection (Water) Policy 2009. Curtis Island, Calliope River and Boyne River Basins Environmental Values and Water Quality Objectives. Department of Environment and Heritage Protection, Brisbane, Australia.

DERM. 2009. Queensland Water Quality Guidelines, Version 3. ISBN 978-0-9806986-0-2, Department of Environment and Resource Management, Brisbane, Australia.

DES. 2018. Monitoring and Sampling Manual: Environmental Protection (Water) Policy 2009. Department of Environment and Science, Brisbane, Australia.

DNRMMRRD. 2025a. Calliope Basin Streamflow Data. Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development, Brisbane, Australia.

DNRMMRRD. 2025b. Fitzroy Basin Streamflow Data. Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development.

DSITI. 2017. Draft environmental values and water quality guidelines: Fitzroy Basin fresh, estuarine and marine waters, including Keppel Bay. Department of Science, Information Technology and Innovation, Brisbane, Australia.

EHP. 2013. Fitzroy River Sub-basin Environmental Values and Water Quality Objectives. Department of Environment and Heritage Protection, Brisbane, Australia.

GPCL. 2023. Long-term Maintenance Dredging Management Plan for the Port of Rockhampton v5. Gladstone Ports Corporation Limited, Gladstone, Australia.

McKee, L. J., B. D. Eyre, and S. Hossain. 2000. Transport and Retention of Nitrogen and Phosphorus in the Sub-Tropical Richmond River Estuary, Australia: A Budget Approach. *Biogeochemistry* **50**:241-278.

Prastka, K., R. Sanders, and T. Jickells. 1998. Has the role of estuaries as sources or sinks of dissolved inorganic phosphorus changed over time? Results of a Kd study. *Marine Pollution Bulletin* **36**:718-728.

Simpson, S. L., G. E. Batley, and A. A. Chariton. 2013. Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines. CSIRO Land and Water, Sydney, Australia.

Vision Environment. 2016. Port of Rockhampton and East Banks Disposal Site Water Quality Monitoring - 2015 Annual Report. Gladstone, Australia.

Vision Environment. 2017. Port of Rockhampton and East Banks Disposal Site Water Quality Monitoring - 2016 Annual Report. Gladstone, Australia.

Vision Environment. 2018. Port of Rockhampton and East Banks Disposal Site Water Quality Monitoring - 2017 Annual Report. Gladstone, Australia.

Vision Environment. 2019. Port of Rockhampton and East Banks Disposal Site Water Quality Monitoring - 2018 Annual Report. Gladstone, Australia.

Vision Environment. 2020. Port of Rockhampton Water Quality Monitoring Program - 2019 Annual Report. Gladstone, Australia.

Vision Environment. 2021. Port of Rockhampton Water Quality Monitoring Program - 2020 Annual Report. Gladstone, Australia.

Vision Environment. 2022. Port of Rockhampton Water Quality Monitoring Program - 2021 Annual Report. Gladstone, Australia.

Vision Environment. 2023. Port of Rockhampton Water Quality Monitoring Program - 2022 Annual Report. Gladstone, Australia.

Vision Environment. 2024. Port of Rockhampton Water Quality Monitoring Program - 2023 Annual Report. Gladstone, Australia.

Vision Environment. 2025. Port of Rockhampton Water Quality Monitoring Program - 2024 Annual Report. Gladstone, Australia.

Vision Environment. 2026. PCIMP Water and Sediment Quality Monitoring: 2025 Annual Report., Gladstone, Australia.

6 APPENDIX

Table A1 Location of water quality monitoring sites in decimal degrees (WGS84).

Site	GPS location
RPRT1WMPOR1	-23.568259, 150.8588
RPRT1WMPOR2	-23.526439, 150.9231
RPRT1WMPOR3	-23.552829, 150.8998

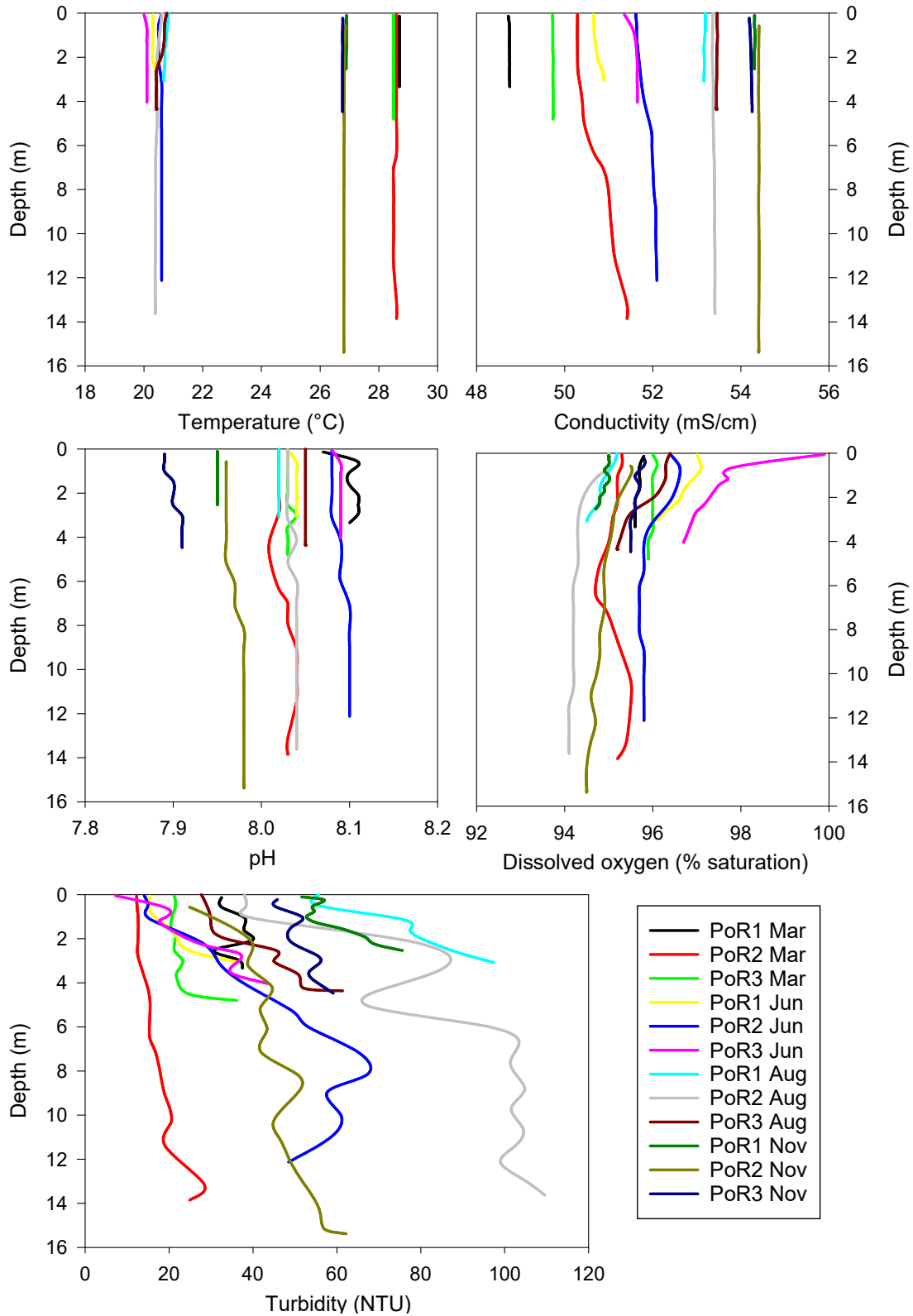


Figure A1 Depth-profiled physicochemical parameters at all Port of Rockhampton sites during 2025.

Table A2 summarises the quality objectives and their achievement. Definitions and acceptance targets for the laboratory QA measures are detailed in the laboratory reports.

Table A2. Summary of project quality objectives

Quality Indicators	Task	Acceptability
Field	Appropriate sampling methods undertaken	Yes
	Experienced sampling personnel	Yes
	Equipment calibrated	Yes
	Required sites sampled	Yes
	Appropriate decontamination procedures	Yes
	Collection of field replicate (1 in 10 samples)	Yes
	Collection of Field Blank (FB)	Yes
	Appropriate Documentation	Yes
	FB results < LOR	Yes, except ammonia, NO _x , dissolved iron and total and dissolved zinc were detected at low levels in one or more surveys
Laboratory	Samples analysed at NATA accredited laboratory	Yes
	Samples analysed within holding periods	Yes
	Method Blanks < LOR	Yes
	Laboratory duplicate samples within recommended RPD%	Yes
	Laboratory control samples within recommended recovery rates	Yes, except matrix spike values for total iron in 2 surveys were less than 50% of the sample's concentration

Table A3 Whole water column physicochemical parameters and TSS at PoR and adjacent and reference PCIMP zones during the 2025 surveys. Values are means ± se (n = 3 to 188). WQO ranges shown represent the 20th to 80th percentile values for pH and dissolved oxygen, and the Wet and Dry Season 80th percentile values for turbidity. No WQO are available for TSS; therefore, the QWQG value (DERM 2009) has been adopted for comparison. Values exceeding the relevant WQO or QWQG are highlighted in blue.

Site	Survey	Temperature (°C)	Conductivity (mS/cm)	pH	Turbidity (NTU)	Dissolved oxygen (% sat.)	TSS (mg/L)
PoR	Mar-25	28.6 ± 0.0	49.9 ± 0.1	8.0 ± 0.0	25 ± 1	96 ± 0	33 ± 10
	Jun-25	20.4 ± 0.0	51.5 ± 0.1	8.1 ± 0.0	31 ± 2	97 ± 0	26 ± 5
	Aug-25	20.5 ± 0.0	53.4 ± 0.0	8.0 ± 0.0	75 ± 4	95 ± 0	51 ± 17
	Nov-25	26.8 ± 0.0	54.3 ± 0.0	7.9 ± 0.0	51 ± 1	95 ± 0	67 ± 19
WQO	-	-	7.2 – 8.3	W = 30, D = 12	87 - 95	20	
NW	Mar-25	27.8 ± 0.0	52.1 ± 0.0	7.8 ± 0.0	21 ± 1	88 ± 0	28 ± 6
	Jun-25	19.6 ± 0.0	52.3 ± 0.0	7.8 ± 0.0	6 ± 1	91 ± 0	8 ± 4
	Aug-25	20.8 ± 0.0	54.0 ± 0.0	7.9 ± 0.0	9 ± 1	94 ± 0	17 ± 5
	Nov-25	27.4 ± 0.0	55.1 ± 0.1	7.8 ± 0.0	13 ± 1	91 ± 0	34 ± 12
WQO	-	-	7.4 – 8.3	W = 30, D = 12	87 - 95	20	
WB	Mar-25	28.1 ± 0.0	53.7 ± 0.0	7.9 ± 0.0	24 ± 1	93 ± 0	49 ± 8
	Jun-25	20.6 ± 0.0	52.2 ± 0.0	7.9 ± 0.0	3 ± 0	95 ± 0	16 ± 3
	Aug-25	20.8 ± 0.0	53.9 ± 0.0	7.9 ± 0.0	10 ± 0	95 ± 0	22 ± 5
	Nov-25	27.4 ± 0.0	55.4 ± 0.0	7.9 ± 0.0	6 ± 0	100 ± 1	21 ± 5
WQO	-	-	7.4 – 8.3	W = 29, D = 17	91 - 100	20	
RCI	Mar-25	26.8 ± 0.0	54.5 ± 0.0	7.9 ± 0.0	3 ± 0	90 ± 1	8 ± 4
	Jun-25	19.1 ± 0.1	53.7 ± 0.0	7.9 ± 0.0	<1	91 ± 0	14 ± 7
	Aug-25	20.8 ± 0.0	54.4 ± 0.0	7.9 ± 0.0	1 ± 0	93 ± 0	5 ± 1
	Nov-25	25.9 ± 0.0	52.8 ± 0.1	7.8 ± 0.0	1 ± 0	86 ± 1	16 ± 4
WQO	-	-	7.4 – 8.3	W = 14, D = 4	86 - 97	20	
RB	Mar-25	26.7 ± 0.0	54.5 ± 0.0	8.0 ± 0.0	5 ± 1	95 ± 0	17 ± 6
	Jun-25	18.6 ± 0.1	53.8 ± 0.0	8.1 ± 0.0	1 ± 0	97 ± 0	7 ± 3
	Aug-25	20.9 ± 0.0	54.2 ± 0.0	8.0 ± 0.0	4 ± 1	96 ± 0	17 ± 6
	Nov-25	25.7 ± 0.0	53.0 ± 0.1	8.0 ± 0.0	3 ± 0	92 ± 0	12 ± 1
WQO	-	-	7.4 – 8.3	W = 12, D = 7	93 - 98	20	

Table A4 Chlorophyll *a* and nutrient concentrations at PoR, and adjacent and reference PCIMP zones during the 2025 surveys. Values are means \pm se ($n = 3$ to 6). Highlighted values indicate exceedances of the 80th percentile WQO (DEHP 2014a, DSITI 2017).

Site	Survey	Chlorophyll <i>a</i> ($\mu\text{g/L}$)	Phosphorous ($\mu\text{g/L}$)	FRP ($\mu\text{g/L}$)	Nitrogen ($\mu\text{g/L}$)	Ammonia ($\mu\text{g/L}$)	NOx ($\mu\text{g/L}$)	TOC (mg/L)	DOC (mg/L)
PoR	Mar-25	1.6 \pm 0.4	39 \pm 7	12 \pm 2	203 \pm 15	4 \pm 1	10 \pm 1	2.3 \pm 0.3	1.9 \pm 0.2
	Jun-25	1.5 \pm 0.2	34 \pm 4	12 \pm 2	187 \pm 15	3 \pm 0	28 \pm 5	3.0 \pm 0.0	1.9 \pm 0.1
	Aug-25	1.5 \pm 0.4	61 \pm 13	9 \pm 1	213 \pm 23	4 \pm 1	32 \pm 12	1.7 \pm 0.3	0.9 \pm 0.0
	Nov-25	1.7 \pm 0.1	52 \pm 9	11 \pm 1	207 \pm 20	<2	36 \pm 3	2.0 \pm 0.0	1.0 \pm 0.0
WQG		2.0	29	7	220	10	9	-	-
NW	Mar-25	1.4 \pm 0.2	28 \pm 5	6 \pm 2	203 \pm 11	11 \pm 3	23 \pm 4	2.0 \pm 0.0	1.5 \pm 0.1
	Jun-25	0.9 \pm 0.1	17 \pm 3	3 \pm 1	138 \pm 7	<2	7 \pm 3	2.5 \pm 0.2	2.2 \pm 0.1
	Aug-25	0.8 \pm 0.1	17 \pm 3	4 \pm 1	118 \pm 5	<2	7 \pm 3	1.5 \pm 0.2	1.2 \pm 0.0
	Nov-25	1.5 \pm 0.1	24 \pm 9	4 \pm 1	168 \pm 16	<2	15 \pm 7	2.0 \pm 0.0	1.4 \pm 0.1
WQG		2.0	29	7	220	10	9	-	-
WB	Mar-25	1.6 \pm 0.3	26 \pm 2	3 \pm 0	205 \pm 8	15 \pm 2	18 \pm 1	2.0 \pm 0.0	1.4 \pm 0.0
	Jun-25	0.7 \pm 0.1	9 \pm 0	<2	135 \pm 2	3 \pm 0	4 \pm 3	3.7 \pm 0.2	2.3 \pm 0.1
	Aug-25	1.0 \pm 0.1	13 \pm 1	2 \pm 0	138 \pm 12	<2	<2	1.2 \pm 0.2	1.1 \pm 0.0
	Nov-25	1.7 \pm 0.2	10 \pm 1	<2	162 \pm 16	3 \pm 1	7 \pm 2	1.8 \pm 0.2	1.3 \pm 0.0
WQG		2.0	29	7	210	8	16	-	-
RCI	Mar-25	1.7 \pm 0.4	11 \pm 1	<2	155 \pm 3	5 \pm 2	4 \pm 0	1.5 \pm 0.3	1.4 \pm 0.1
	Jun-25	0.5 \pm 0.1	5 \pm 1	<2	118 \pm 9	<2	<2	3.3 \pm 0.3	2.0 \pm 0.1
	Aug-25	0.7 \pm 0.0	6 \pm 0	<2	95 \pm 6	<2	<2	0.9 \pm 0.1	0.9 \pm 0.1
	Nov-25	0.9 \pm 0.1	6 \pm 1	<2	140 \pm 15	8 \pm 2	5 \pm 2	1.5 \pm 0.3	1.4 \pm 0.2
WQG		1.4	15	3	180	15	5	-	-
RB	Mar-25	1.1 \pm 0.2	11 \pm 1	<2	147 \pm 17	<2	3 \pm 1	1.3 \pm 0.3	1.1 \pm 0.1
	Jun-25	1.0 \pm 0.2	6 \pm 1	<2	193 \pm 64	<2	<2	2.7 \pm 0.3	2.1 \pm 0.1
	Aug-25	0.8 \pm 0.2	7 \pm 1	<2	110 \pm 6	<2	<2	1.0 \pm 0.0	1.0 \pm 0.1
	Nov-25	1.2 \pm 0.2	7 \pm 1	<2	140 \pm 6	7 \pm 1	2 \pm 1	1.7 \pm 0.3	1.2 \pm 0.1
WQG		2.2	21	3	200	4	3	-	-

Table A5 Total and dissolved metal(loid) concentrations at PoR, and adjacent and reference PCIMP zones during the 2025 surveys.

Values are means \pm se ($n = 3$ to 6). The 99% AWQG applicable to Narrows, Colosseum Inlet and Rodds Bay (DEHP 2014a). AWQG applicable to dissolved metal(loid) concentrations only. Values exceeding AWQG are highlighted in blue.

Site	Survey	Aluminium ($\mu\text{g/L}$)		Arsenic ($\mu\text{g/L}$)		Cadmium ($\mu\text{g/L}$)		Chromium ($\mu\text{g/L}$)		Cobalt ($\mu\text{g/L}$)		Copper ($\mu\text{g/L}$)	
		Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
PoR	Mar-25	<5	1673 \pm 438	1.5 \pm 0.0	1.9 \pm 0.1	<0.1	<0.1	<1	2.5 \pm 0.6	<1	<1	<1	1.5 \pm 0.2
	Jun-25	6 \pm 2	910 \pm 182	1.3 \pm 0.0	1.6 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Aug-25	6 \pm 0	5447 \pm 1234	1.1 \pm 0.0	2.3 \pm 0.2	<0.1	<0.1	<1	5.2 \pm 1.7	<1	1.2 \pm 0.4	-	-
	Nov-25	<5	2677 \pm 688	1.2 \pm 0.0	2.0 \pm 0.2	<0.1	<0.1	<1	4.1 \pm 1.0	<1	1.0 \pm 0.3	-	-
NW	Mar-25	7 \pm 1	1487 \pm 374	1.3 \pm 0.1	1.8 \pm 0.2	<0.1	<0.1	<1	<1	<1	<1	<1	1.4 \pm 0.1
	Jun-25	6 \pm 2	542 \pm 203	<1	1.1 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Aug-25	5 \pm 1	727 \pm 266	<1	1.1 \pm 0.2	<0.1	<0.1	<1	1.1 \pm 0.4	<1	<1	-	-
	Nov-25	5 \pm 1	1165 \pm 628	1.0 \pm 0.1	1.5 \pm 0.2	<0.1	<0.1	<1	1.8 \pm 0.9	<1	<1	-	-
WB	Mar-25	9 \pm 1	1473 \pm 202	1.3 \pm 0.0	2 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	<1	1.9 \pm 0.2
	Jun-25	17 \pm 3	292 \pm 45	<1	<1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Aug-25	7 \pm 1	745 \pm 137	<1	1.3 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Nov-25	5 \pm 1	333 \pm 54	1.3 \pm 0.1	1.5 \pm 0.0	<0.1	<0.1	<1	<1	<1	<1	-	-
RCI	Mar-25	9 \pm 0	313 \pm 60	1.5 \pm 0.0	1.9 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1
	Jun-25	<5	65 \pm 11	1.3 \pm 0.1	1.3 \pm 0.0	<0.1	<0.1	<1	<1	<1	<1	-	-
	Aug-25	<5	104 \pm 22	<1	1.2 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Nov-25	7 \pm 1	125 \pm 9	1.4 \pm 0.0	1.6 \pm 0.0	<0.1	<0.1	<1	<1	<1	<1	-	-
RB	Mar-25	8 \pm 1	197 \pm 35	1.6 \pm 0.0	1.8 \pm 0.0	<0.1	<0.1	<1	<1	<1	<1	<1	<1
	Jun-25	<5	48 \pm 15	1.2 \pm 0.1	1.2 \pm 0.0	<0.1	<0.1	<1	<1	<1	<1	-	-
	Aug-25	<5	157 \pm 73	1.1 \pm 0.0	1.3 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
	Nov-25	<5	122 \pm 33	1.6 \pm 0.1	1.7 \pm 0.1	<0.1	<0.1	<1	<1	<1	<1	-	-
95% AWQG		37	-	-	-	5.5	-	Cr(III) 27.4, Cr(VI) 4.4		1	-	1.3	-
99% AWQG		9	-	-	-	0.7	-	Cr(III) 7.7, Cr(VI) 0.14		0.005	-	0.3	-

Site	Survey	Gallium (µg/L)		Iron (µg/L)		Lead (µg/L)		Manganese (µg/L)		Mercury (µg/L)	
		Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
PoR	Mar-25	<1	<1	<5	1300 ± 354	<1	<1	<1	20 ± 6	<0.1	<0.1
	Jun-25	<1	<1	<5	927 ± 190	<1	<1	<1	16 ± 3	<0.1	<0.1
	Aug-25	<1	1.2 ± 0.4	5 ± 1	2890 ± 640	<1	1.0 ± 0.3	<1	47 ± 11	<0.1	<0.1
	Nov-25	<1	<1	<5	2103 ± 504	<1	<1	<1	39 ± 11	<0.1	<0.1
NW	Mar-25	<1	<1	<5	1053 ± 239	<1	<1	1 ± 0	21 ± 4	<0.1	<0.1
	Jun-25	<1	<1	6 ± 1	407 ± 174	<1	<1	5 ± 1	11 ± 2	<0.1	<0.1
	Aug-25	<1	<1	12 ± 4	468 ± 149	<1	<1	3 ± 1	9 ± 2	<0.1	<0.1
	Nov-25	<1	<1	9 ± 1	920 ± 455	<1	<1	3 ± 1	21 ± 7	<0.1	<0.1
WB	Mar-25	<1	<1	<5	1197 ± 141	<1	<1	2 ± 1	29 ± 4	<0.1	<0.1
	Jun-25	<1	<1	<5	202 ± 32	<1	<1	3 ± 0	8 ± 1	<0.1	<0.1
	Aug-25	<1	<1	10 ± 2	545 ± 83	<1	<1	1 ± 0	12 ± 2	<0.1	<0.1
	Nov-25	<1	<1	7 ± 1	362 ± 59	<1	<1	3 ± 1	12 ± 1	<0.1	<0.1
RCI	Mar-25	<1	<1	<5	253 ± 49	<1	<1	3 ± 2	9 ± 1	<0.1	<0.1
	Jun-25	<1	<1	5 ± 2	50 ± 7	<1	<1	4 ± 1	4 ± 1	<0.1	<0.1
	Aug-25	<1	<1	14 ± 3	106 ± 18	<1	<1	2 ± 1	4 ± 1	<0.1	<0.1
	Nov-25	<1	<1	6 ± 1	120 ± 7	<1	<1	7 ± 3	10 ± 3	<0.1	<0.1
RB	Mar-25	<1	<1	<5	153 ± 23	<1	<1	1 ± 0	6 ± 1	<0.1	<0.1
	Jun-25	<1	<1	<5	39 ± 11	<1	<1	4 ± 0	4 ± 0	<0.1	<0.1
	Aug-25	<1	<1	13 ± 5	175 ± 80	<1	<1	2 ± 1	5 ± 1	<0.1	<0.1
	Nov-25	<1	<1	9 ± 2	125 ± 36	<1	<1	3 ± 1	7 ± 1	<0.1	<0.1
95% AWQG		-	-	-	-	4.4	-	-	-	0.4	-
99% AWQG		-	-	-	-	2.2	-	-	-	0.1	-

Site	Survey	Molybdenum (µg/L)		Nickel (µg/L)		Silver (µg/L)		Tin (µg/L)		Vanadium (µg/L)		Zinc (µg/L)	
		Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
PoR	Mar-25	10 ± 0	10 ± 0	<1	4.9 ± 2.3	<1	<1	<1	<1	2.9 ± 0.0	5.0 ± 0.6	4.6 ± 2.3	2.5 ± 0.4
	Jun-25	11 ± 0	11 ± 0	<1	2.1 ± 0.2	<1	<1	<1	<1	1.9 ± 0.0	4.1 ± 0.5	2.2 ± 0.2	1.7 ± 0.3
	Aug-25	11 ± 0	11 ± 0	<1	5.5 ± 1.1	<1	<1	<1	<1	1.7 ± 0.0	8.7 ± 1.4	1.9 ± 0.4	7.6 ± 1.6
	Nov-25	11 ± 0	11 ± 0	<1	4.2 ± 1.1	<1	<1	<1	<1	2.1 ± 0.1	6.3 ± 1.1	2.0 ± 0.2	5.5 ± 0.9
NW	Mar-25	11 ± 0	11 ± 0	<1	1.8 ± 0.4	<1	<1	<1	<1	2.4 ± 0.1	4.3 ± 0.6	<1	2.9 ± 0.3
	Jun-25	11 ± 0	11 ± 0	<1	1.1 ± 0.3	<1	<1	<1	<1	1.9 ± 0.1	2.5 ± 0.3	1.9 ± 0.2	1.9 ± 0.2
	Aug-25	11 ± 0	11 ± 0	<1	1.0 ± 0.3	<1	<1	<1	<1	1.5 ± 0.1	2.6 ± 0.4	3.8 ± 1.9	8.1 ± 6.4
	Nov-25	12 ± 0	12 ± 0	<1	1.9 ± 0.7	<1	<1	<1	<1	2.2 ± 0.1	4.0 ± 0.8	1.6 ± 0.2	1.9 ± 0.9
WB	Mar-25	12 ± 0	12 ± 0	<1	1.6 ± 0.3	<1	<1	<1	<1	2.5 ± 0.2	4.9 ± 0.4	<1	2.9 ± 0.3
	Jun-25	12 ± 0	12 ± 0	<1	<1	<1	<1	<1	<1	2.2 ± 0.1	2.3 ± 0.1	2.1 ± 0.2	2.7 ± 0.5
	Aug-25	11 ± 0	11 ± 0	<1	<1	<1	<1	<1	<1	1.6 ± 0.0	2.9 ± 0.3	1.8 ± 0.3	2.0 ± 0.4
	Nov-25	12 ± 0	13 ± 0	<1	<1	<1	<1	<1	<1	2.0 ± 0.1	3.3 ± 0.2	2.2 ± 0.4	1.6 ± 0.4
RCI	Mar-25	11 ± 0	12 ± 0	<1	<1	<1	<1	<1	<1	2.1 ± 0.1	2.6 ± 0.3	<1	<1
	Jun-25	11 ± 0	11 ± 0	<1	<1	<1	<1	<1	<1	1.7 ± 0.1	1.6 ± 0.0	2.8 ± 1.0	1.3 ± 0.3
	Aug-25	10 ± 0	11 ± 0	<1	<1	<1	<1	<1	<1	1.5 ± 0.0	1.7 ± 0.0	1.6 ± 0.1	1.4 ± 0.4
	Nov-25	11 ± 0	11 ± 0	<1	<1	<1	<1	<1	<1	1.8 ± 0.1	2.3 ± 0.1	2.3 ± 0.8	<1
RB	Mar-25	11 ± 0	12 ± 0	<1	<1	<1	<1	<1	<1	2.1 ± 0.0	1.9 ± 0.1	<1	<1
	Jun-25	10 ± 0	15 ± 2	<1	<1	<1	<1	<1	<1	1.8 ± 0.1	1.6 ± 0.1	2.1 ± 0.5	2.0 ± 0.8
	Aug-25	10 ± 0	10 ± 0	<1	<1	<1	<1	<1	<1	1.6 ± 0.1	1.8 ± 0.2	2.3 ± 0.4	1.0 ± 0.3
	Nov-25	11 ± 0	12 ± 0	<1	<1	<1	<1	<1	<1	1.6 ± 0.2	2.2 ± 0.0	1.8 ± 0.1	<1
95% AWQG		-	-	70	-	1.4	-	-	-	100	-	8	-
99% AWQG		-	-	7	-	0.8	-	-	-	50	-	3.3	-

Table A6 Results of two-way ANOVAs comparing PoR with adjacent and reference PCIMP zones.

Analyses were not undertaken for total and dissolved cadmium, mercury, silver and tin, or for dissolved chromium, cobalt, copper, gallium, lead and nickel, as concentrations were generally below LOR. Two-way ANOVA for total copper was performed for the March survey only.

Parameter	Zone		Survey		Interaction		Comment
	P-value	F statistic	P-value	F statistic	P-value	F statistic	
Temperature	<0.05	1221	<0.05	81595	<0.05	258	Temperatures were significantly different for each survey, increasing in temperature from June < August < November < March. Temperatures were significantly different for each zone, increasing in temperature from RB < RCI < NW < WB < PoR.
Conductivity	<0.05	588	<0.05	821	<0.05	484	Conductivity was significantly different for each survey, increasing in conductivity from June < March < August < November. Conductivity was significantly lowest in PoR, followed by NW. WB was significantly higher than NW and RB and RCI were higher than WB, but significantly the same.
pH	<0.05	461	<0.05	163	<0.05	11	pH was significantly lowest in November and significantly highest in June and August. pH in NW was significantly lower than WB and RCI, which were significantly lower than RB and PoR, which were significantly the same.
Turbidity	<0.05	734	<0.05	76	<0.05	91	Turbidity was significantly lowest at RCI and RB. Turbidity then increased from WB < NW < PoR. Turbidity was significantly lowest during June, followed by November. Turbidity in August and March was then significantly higher than November.
Dissolved Oxygen	<0.05	233	<0.05	39	<0.05	42	DO was significantly lower in March, followed by November. June and August were significantly higher than November. DO was significantly lowest at RCI, followed by NW and then RB. PoR and WB were significantly higher than RB.
TSS	<0.05	10	<0.05	4	0.07	2	TSS was significantly higher in November and March than June. August was significantly the same as all other surveys. TSS was significantly lowest at RCI, RB and NW. WB was significantly similar to NW, but significantly higher than RCI and RB. PoR TSS was significantly highest.
Chlorophyll a	<0.05	5	<0.05	10	0.12	2	Chlorophyll a was significantly higher in March and November than it was in June and August. Chlorophyll a was significantly highest in PoR than other zones. RCI, RB and NW were significantly lowest, while NW was significantly higher than RCI.
Phosphorus	<0.05	41	<0.05	4	0.37	2	Phosphorus was significantly higher in March, November and August and significantly lower in June. Phosphorus was significantly highest in PoR than all other zones.
FRP	<0.05	66	0.09	1	0.27	<1	FRP was significantly higher in PoR than all other zones. No significant difference between surveys.

Parameter	Zone		Survey		Interaction		Comment
	P-value	F statistic	P-value	F statistic	P-value	F statistic	
Nitrogen	<0.05	10	<0.05	8	<0.05	2	Nitrogen was significantly higher in March and were significantly lower in June and August. Nitrogen was significantly higher in PoR than all other zones.
Ammonia	<0.05	3	<0.05	17	<0.05	8	Ammonia was significantly higher in March than all other surveys. Ammonia was significantly higher in WB than all other zones.
Nitrogen oxides	<0.05	23	0.13	2	<0.05	4	NOx was significantly highest in PoR than other zones and significantly lowest at RB and RCI.
TOC	<0.05	5	<0.05	62	<0.05	3	TOC was significantly higher in June and significantly lower in August. TOC was significantly higher in PoR, WB and NW than other zones.
DOC	<0.05	4	<0.05	126	<0.05	4	DOC was significantly higher in WB and NW than other zones. DOC concentrations were significantly different for each survey, increasing from August < November < March < June.
Dissolved Al	<0.05	9	<0.05	4	<0.05	4	Dissolved Al was significantly higher in March and June than the other surveys. Dissolved Al was significantly higher in WB than all other zones.
Total Al	<0.05	27	<0.05	8	<0.05	6	Total Al was significantly lower in June than all other surveys. Total Al was significantly highest in PoR than other zones.
Dissolved As	<0.05	10	<0.05	25	0.33	1	Dissolved As was significantly different for each survey, increasing from August < June < November < March. Dissolved As was significantly highest in RCI, RB and POR than other zones.
Total As	<0.05	9	<0.05	19	0.06	2	Total As was significantly different for each survey, increasing from June < August < November < March. Total As was significantly highest in PoR than all other zones.
Total Cr	<0.05	21	<0.05	6	<0.05	3	Total Cr was significantly higher in PoR than other zones. Total Cr was significantly highest in August and November, and significantly lowest during June and March.
Total Co	<0.05	8	<0.05	5	<0.05	3	Total Co was significantly higher in November except August. Total Co was significantly higher in PoR than all other zones.
Total Cu	<0.05	17	-	-	-	-	Total Cu was significantly higher at WB, NW and PoR than RCI and RB.
Total Gallium	<0.05	4	<0.05	4	<0.05	4	Total Ga was significantly higher in August except June. Total Ga was significantly higher in PoR than all other zones.
Dissolved Fe	<0.05	1	0.23	16	0.60	<1	Dissolved Fe was significantly different for multiple surveys, increasing from March and June < November < August.
Total Fe	<0.05	26	<0.05	5	<0.05	3	Total Fe was significantly lower in June than all other surveys. Total Fe in PoR was significantly higher, and RB and RCI was significantly lower than other zones.
Dissolved Mn	<0.05	5	<0.05	3	0.58	<1	Dissolved Mn was significantly higher in November except for June.

Parameter	Zone		Survey		Interaction		Comment
	P-value	F statistic	P-value	F statistic	P-value	F statistic	
							Dissolved Mn in PoR was significantly lower than all other sites.
Total Mn	<0.05	18	<0.05	5	<0.05	4	Total Mn was significantly lower in March except for November. Total Mn in PoR was significantly higher than all other zones
Dissolved Mo	<0.05	18	<0.05	10	<0.05	3	Dissolved Mo was significantly lower in March and June < March < November. Dissolved Mo was significantly lower during August and significantly higher during November.
Total Mo	<0.05	8	<0.05	6	<0.05	5	Total Mo was significantly lower in August than all other surveys. Total Mo was significantly higher in RB than all other zones except WB.
Total Ni	<0.05	27	0.15	2	0.09	2	Total Ni resulted in no differences between surveys. Total Ni significantly highest in PoR followed by NW except for WB.
Total Pb	0.43	<1	0.68	<1	0.30	<1	No significant differences between surveys or zones were found.
Dissolved V	<0.05	11	0.8	54	<0.05	2	Dissolved V significantly highest in WB and PoR, and significantly lowest at RCI and RB. Dissolved V significantly lowest in August and significantly highest in March.
Total V	<0.05	33	<0.05	7	<0.05	4	Total V significantly lowest in June, and significantly highest in March, except November. Total V significantly highest in PoR and significantly lowest in RB and RCI.
Dissolved Zn	0.93	<1	0.22	2	0.06	2	No significant differences between surveys or zones were found.
Total Zn	0.15	2	0.35	1	0.75	<1	No significant differences between surveys or zones were found.



REPORT OF ANALYSIS

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680	Job No. : VISIO5/250313 Quote No. : QT-02294 Order No. : Date Received : 13-MAR-2025 Sampled By : CLIENT
Attention : FELICITY MELVILLE	Phone : 1300 722 845
Project Name :	
For Follow up enquiries : ASB@measurement.gov.au	

Lab Reg No.	Sample Ref	Sample Description
N25/003775	POR1	SEAWATER 10/03/2025 6:52
N25/003776	POR2	SEAWATER 10/03/2025 7:27
N25/003777	POR3A	SEAWATER 10/03/2025 7:13
N25/003778	POR3B	SEAWATER 10/03/2025 7:13

Lab Reg No.		N25/003775	N25/003776	N25/003777	N25/003778	
Date Sampled		10-MAR-2025	10-MAR-2025	10-MAR-2020	10-MAR-2025	
	Units					Method
Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	<5	<5	<5	<5	NT2_47
Arsenic Filtered	ug/L	1.5	1.5	1.6	1.6	NT2_47
Cadmium Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Cobalt Filtered	ug/L	<1	<1	<1	<1	NT2_47
Copper Filtered	ug/L	<1	<1	<1	<1	NT2_47
Gallium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Iron Filtered	ug/L	<5	5	<5	<5	NT2_47
Lead Filtered	ug/L	<1	<1	<1	<1	NT2_47
Manganese Filtered	ug/L	<1	<1	<1	<1	NT2_47
Molybdenum Filtered	ug/L	10	10	10	11	NT2_47
Nickel Filtered	ug/L	1	1.1	<1	<1	NT2_47
Silver Filtered	ug/L	<1	<1	<1	<1	NT2_47
Tin Filtered	ug/L	<1	<1	<1	<1	NT2_47
Vanadium Filtered	ug/L	2.9	2.9	3	3	NT2_47
Zinc Filtered	ug/L	2.5	9.2	2.1	2	NT2_47
Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	2490	990	1540	1830	NT2_47
Arsenic Total	ug/L	2.1	1.8	1.9	2	NT2_47
Cadmium Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Total	ug/L	3.7	1.8	2	2.4	NT2_47
Cobalt Total	ug/L	<1	<1	<1	<1	NT2_47
Copper Total	ug/L	1.9	1.2	1.4	1.5	NT2_47
Gallium Total	ug/L	<1	<1	<1	<1	NT2_47
Iron Total	ug/L	1960	750	1190	1350	NT2_47

REPORT OF ANALYSIS

Page: 2 of 5
Report No. RN1459203


Lab Reg No.		N25/003775	N25/003776	N25/003777	N25/003778	
Date Sampled		10-MAR-2025	10-MAR-2025	10-MAR-2020	10-MAR-2025	
	Units					Method
Total Recoverable Trace Elements by ICP						
Lead Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Manganese Total	ug/L	31	12	18	21	NT2_47
Molybdenum Total	ug/L	9.8	10	9.9	10	NT2_47
Nickel Total	ug/L	3.7	1.6	9.3	2.3	NT2_47
Silver Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Tin Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Vanadium Total	ug/L	6.1	4	4.8	5.1	NT2_47
Zinc Total	ug/L	3.3	2	2.2	1.9	NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1	< 0.1	< 0.1	< 0.1	NT2_44
Dates						
Date extracted		19-MAR-2025	19-MAR-2025	19-MAR-2025	19-MAR-2025	
Date analysed		21-MAR-2025	21-MAR-2025	21-MAR-2025	21-MAR-2025	



Richard Tea, Analyst
Inorganics - NSW
Accreditation No. 198

24-MAR-2025

Lab Reg No.		N25/003775	N25/003776	N25/003777	N25/003778	
Date Sampled		10-MAR-2025	10-MAR-2025	10-MAR-2020	10-MAR-2025	
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	51	17	31	28	NW_S13
Dates						
Date extracted		18-MAR-2025	18-MAR-2025	18-MAR-2025	18-MAR-2025	
Date analysed		18-MAR-2025	18-MAR-2025	18-MAR-2025	18-MAR-2025	



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

24-MAR-2025

REPORT OF ANALYSIS

Page: 3 of 5

Report No. RN1459203

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680 Attention : FELICITY MELVILLE Project Name : For Follow up enquiries : ASB@measurement.gov.au	Job No. : VISIO5/250313 Quote No. : QT-02294 Order No. : Date Received : 13-MAR-2025 Sampled By : CLIENT Phone : 1300 722 845
--	--

Lab Reg No.	Sample Ref	Sample Description
N25/003779	FB5	FRESHWATER 10/03/2025 7:00

Lab Reg No.		N25/003779				
Date Sampled		10-MAR-2025				
	Units					Method

Filtered Trace Elements by ICP						
Element	Units	Value				Method
Aluminium Filtered	ug/L	<5				NT2_47
Arsenic Filtered	ug/L	<1				NT2_47
Cadmium Filtered	ug/L	<0.1				NT2_47
Chromium Filtered	ug/L	<1				NT2_47
Cobalt Filtered	ug/L	<1				NT2_47
Copper Filtered	ug/L	<1				NT2_47
Gallium Filtered	ug/L	<1				NT2_47
Iron Filtered	ug/L	5.5				NT2_47
Lead Filtered	ug/L	<1				NT2_47
Manganese Filtered	ug/L	<1				NT2_47
Molybdenum Filtered	ug/L	<1				NT2_47
Nickel Filtered	ug/L	<1				NT2_47
Silver Filtered	ug/L	<1				NT2_47
Tin Filtered	ug/L	<1				NT2_47
Vanadium Filtered	ug/L	<1				NT2_47
Zinc Filtered	ug/L	<1				NT2_47

Filtered Mercury by CV-AAS						
Element	Units	Value				Method
Mercury - Filtered	ug/L	<0.1				NT2_44

Total Recoverable Trace Elements by ICP						
Element	Units	Value				Method
Aluminium Total	ug/L	<5				NT2_47
Arsenic Total	ug/L	<1				NT2_47
Cadmium Total	ug/L	<0.1				NT2_47
Chromium Total	ug/L	<1				NT2_47
Cobalt Total	ug/L	<1				NT2_47
Copper Total	ug/L	<1				NT2_47
Gallium Total	ug/L	<1				NT2_47
Iron Total	ug/L	<5				NT2_47
Lead Total	ug/L	<1				NT2_47
Manganese Total	ug/L	<1				NT2_47
Molybdenum Total	ug/L	<1				NT2_47

REPORT OF ANALYSIS

Page: 4 of 5
Report No. RN1459203

Lab Reg No.		N25/003779				
Date Sampled		10-MAR-2025				
	Units					
Total Recoverable Trace Elements by ICP						
Nickel Total	ug/L	< 1				NT2_47
Silver Total	ug/L	< 1				NT2_47
Tin Total	ug/L	< 1				NT2_47
Vanadium Total	ug/L	< 1				NT2_47
Zinc Total	ug/L	< 1				NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1				NT2_44
Dates						
Date extracted		19-MAR-2025				
Date analysed		21-MAR-2025				



Richard Tea, Analyst
Inorganics - NSW
Accreditation No. 198

24-MAR-2025

Lab Reg No.		N25/003779				
Date Sampled		10-MAR-2025				
	Units					
Miscellaneous						
Suspended Solids - Total	mg/L	< 2				NW_S13
Dates						
Date extracted		18-MAR-2025				
Date analysed		18-MAR-2025				



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

24-MAR-2025

REPORT OF ANALYSIS

Page: 5 of 5
Report No. RN1459203

Total = acid extractable elements



WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250313**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/003775				N25/003775
Suspended Solids - Total	NW_S13	mg/L	2	<2	49	52	6	88	NA

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)
20/03/2025

Date:

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250313**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/003778				N25/003778
Aluminium Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	87	90
Arsenic Filtered	NT2_47	ug/L	1	<1	1.6	1.5	6	98	104
Cadmium Filtered	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	106	97
Chromium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	91	107
Cobalt Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	91	105
Copper Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	97	104
Gallium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	91	104
Iron Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	94	93
Lead Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	94
Manganese Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	106	98
Mercury - Filtered	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	108	100
Molybdenum Filtered	NT2_47	ug/L	1	<1	11	11	0	95	101
Nickel Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	97	106
Silver Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	103	100
Tin Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	98	98
Vanadium Filtered	NT2_47	ug/L	1	<1	3	2.9	3	89	108
Zinc Filtered	NT2_47	ug/L	1	<1	1.5	2.5	NA	106	104
Aluminium Total	NT2_47	ug/L	5	<5	1800	1870	4	99	108
Arsenic Total	NT2_47	ug/L	1	<1	2	1.9	5	97	99
Cadmium Total	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	94	100
Chromium Total	NT2_47	ug/L	1	<1	2.5	2.2	13	105	101
Cobalt Total	NT2_47	ug/L	1	<1	<1	<1	NA	105	100
Copper Total	NT2_47	ug/L	1	<1	1.5	1.5	0	102	100
Gallium Total	NT2_47	ug/L	1	<1	<1	<1	NA	106	100
Iron Total	NT2_47	ug/L	5	<5	1330	1370	3	104	101
Lead Total	NT2_47	ug/L	1	<1	<1	<1	NA	100	99
Manganese Total	NT2_47	ug/L	1	<1	21	21	0	103	94
Mercury - Total	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	95	94
Molybdenum Total	NT2_47	ug/L	1	<1	10	10	0	101	100
Nickel Total	NT2_47	ug/L	1	<1	2.5	2.2	13	103	101
Silver Total	NT2_47	ug/L	1	<1	<1	<1	NA	104	102
Tin Total	NT2_47	ug/L	1	<1	<1	<1	NA	100	98

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Vanadium Total	NT2_47	ug/L	1	<1	5.2	5.1	2	105	100
Zinc Total	NT2_47	ug/L	1	<1	1.9	2	5	95	101

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)

Date:

24/03/2025



CERTIFICATE OF ANALYSIS

Work Order : **EB2509361**
Client : **VISION ENVIRONMENT ANZ**
Contact : FELICITY MELVILLE
Address : OFFICE 3 165 AUCKLAND STREET
GLADSTONE 4680
Telephone : ----
Project : PoR March 2025
Order number : ----
C-O-C number : ----
Sampler : ----
Site :
Quote number : BN/133/19 V4 PCIMP
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Kelly Schafer
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 4978 7944
Date Samples Received : 21-Mar-2025 11:00
Date Analysis Commenced : 25-Mar-2025
Issue Date : 27-Mar-2025 12:53



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

Don Sirimanne

Senior Biologist - Water

Canberra Water Microbiology / Biology, Hume, ACT



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 Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID			POR1	POR2	POR3A	POR3B	FB5
		Sampling date / time			10-Mar-2025 06:52	10-Mar-2025 07:27	10-Mar-2025 07:12	10-Mar-2025 07:13	10-Mar-2025 07:00
Compound	CAS Number	LOR	Unit	EB2509361-001	EB2509361-002	EB2509361-003	EB2509361-004	EB2509361-005	
				Result	Result	Result	Result	Result	
EP008CA: Chlorophyll a									
Chlorophyll a	----	0.02	µg/L	2.33	1.47	0.92	1.70	<0.02	

Inter-Laboratory Testing

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

(WATER) EP008CA: Chlorophyll a



QUALITY CONTROL REPORT

Work Order	: EB2509361	Page	: 1 of 3
Client	: VISION ENVIRONMENT ANZ	Laboratory	: Environmental Division Brisbane
Contact	: FELICITY MELVILLE	Contact	: Kelly Schafer
Address	: OFFICE 3 165 AUCKLAND STREET GLADSTONE 4680	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 4978 7944
Project	: PoR March 2025	Date Samples Received	: 21-Mar-2025
Order number	: ----	Date Analysis Commenced	: 25-Mar-2025
C-O-C number	: ----	Issue Date	: 27-Mar-2025
Sampler	: ----		
Site	:		
Quote number	: BN/133/19 V4 PCIMP		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP008CA: Chlorophyll a (QCLot: 6462990)								
EP008: Chlorophyll a	----	0.02	µg/L	<0.02	200 µg/L	102	85.0	113

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.**

CERTIFICATE OF ANALYSIS

CLIENT : Vision Environment ANZ
(HVEC) 3/165 Auckland St
GLADSTONE QLD 4680
felicity@visionenvironment.com.au

ATTN: F Melville

Laboratory Reference : SSP0093097
Client Order No. : MELVILLE_F
Quote Number : 24IN1001_F Melville
Date Received : 21-Mar-2025
Date Commenced : 25-Mar-2025
Laboratory Number/s : SS25KN969-SS25KN973

Number of Samples : 5

Reason for Analysis : Environmental Research

Method/s of Analysis : 13796 - Nitrogen (Ammonia) by Flow Injection Analysis
13798 - Nitrogen (Oxides) by Flow Injection Analysis
13799 - Phosphorus (Filterable Reactive) by Flow Injection Analysis
13800 - Phosphorus (Total) by Simultaneous Persulfate or Kjeldahl Digestion
13802 - Nitrogen (Total) by Simultaneous Persulfate Digestion
16628 - Total Organic Carbon by High Temperature Oxidation



SS25KN969-SS25KN973

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

Enquiries **Jane Pullar**
Phone **(+61 7) 30962807**
Email **jane.pullar@health.qld.gov.au**

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone **(+61) 1800 000 FSS (377)**
Fax **(+61 7) 3096 2977**
Email **FSS@health.qld.gov.au**

Client Reference				POR1	POR2	POR3A	POR3B
Sample Type				Water Sea Filtered	Water Sea Filtered	Water Sea Filtered	Water Sea Filtered
Sampling Time/Date				09:43 01-Nov-2024	09:06 01-Nov-2024	09:06 01-Nov-2024	09:48 01-Nov-2024
Sample Description							
Method	Nutrients	Units	Reporting Limit	SS25KN969	SS25KN970	SS25KN971	SS25KN972
13796	Ammonia	mg/L as N	0.002	0.003	0.004	0.005	0.005
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	0.015	0.011	0.009	0.012
13798	Nitrogen Oxides	mg/L as N	0.002	0.009	0.009	0.011	0.016
13800	Total Phosphorus	mg/L as P	0.003	0.052	0.030	0.036	0.036
13802	Total Nitrogen	mg/L as N	0.02	0.23	0.18	0.20	0.19
16628	Total Organic Carbon as NPOC	mg/L as C	1	3	2	2	2
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	2.3	1.7	1.7	1.7

Client Reference				FB5
Sample Type				Water Sea Filtered
Sampling Time/Date				12:00 01-Nov-2024
Sample Description				
Method	Nutrients	Units	Reporting Limit	SS25KN973
13796	Ammonia	mg/L as N	0.002	0.009
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	< 0.002
13798	Nitrogen Oxides	mg/L as N	0.002	0.004
13800	Total Phosphorus	mg/L as P	0.003	< 0.003
13802	Total Nitrogen	mg/L as N	0.02	< 0.02
16628	Total Organic Carbon as NPOC	mg/L as C	1	< 1
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	< 0.5

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).



NATA Accredited
Laboratory 41
Accredited for compliance
with ISO/IEC 17025 - Testing

SS25KN969-SS25KN973

34896-21691 Printed: 14:49 02-Apr-25 pjacc



REPORT OF ANALYSIS

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680	Job No. : VISIO5/250619 Quote No. : QT-02294 Order No. : Date Received : 19-JUN-2025 Sampled By : CLIENT
Attention : FELICITY MELVILLE	Phone : 1300 722 845
Project Name :	
For Follow up enquiries : ASB@measurement.gov.au	

Lab Reg No.	Sample Ref	Sample Description
N25/010548	POR1A	SEAWATER 11/06/2025 9:21
N25/010549	POR1B	SEAWATER 11/06/2025 9:21
N25/010550	POR2	SEAWATER 11/06/2025 9:47
N25/010551	POR3	SEAWATER 11/06/2025 9:36

Lab Reg No.		N25/010548	N25/010549	N25/010550	N25/010551	
Date Sampled		11-JUN-2025	11-JUN-2025	11-JUN-2025	11-JUN-2025	
Sample Reference		POR1A	POR1B	POR2	POR3	
	Units					Method
Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	7.2	<5	7.8	<5	NT2_47
Arsenic Filtered	ug/L	1.2	1.3	1.3	1.3	NT2_47
Cadmium Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Cobalt Filtered	ug/L	<1	<1	<1	<1	NT2_47
Copper Filtered	ug/L	2.8	3.7	1.1	2.4	NT2_47
Gallium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Iron Filtered	ug/L	<5	21	<5	7.6	NT2_47
Lead Filtered	ug/L	<1	<1	<1	<1	NT2_47
Manganese Filtered	ug/L	<1	<1	<1	<1	NT2_47
Molybdenum Filtered	ug/L	11	11	11	11	NT2_47
Nickel Filtered	ug/L	<1	<1	<1	<1	NT2_47
Silver Filtered	ug/L	<1	<1	<1	<1	NT2_47
Tin Filtered	ug/L	<1	<1	<1	<1	NT2_47
Vanadium Filtered	ug/L	2	2.1	1.9	1.9	NT2_47
Zinc Filtered	ug/L	1.8	2.1	2.4	2.5	NT2_47
Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	1260	720	820	650	NT2_47
Arsenic Total	ug/L	1.7	1.4	1.7	1.4	NT2_47
Cadmium Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Total	ug/L	<1	<1	<1	1.6	NT2_47
Cobalt Total	ug/L	<1	<1	<1	<1	NT2_47
Copper Total	ug/L	1.7	2.0	1.6	1.5	NT2_47
Gallium Total	ug/L	<1	<1	<1	<1	NT2_47
Iron Total	ug/L	1220	710	990	570	NT2_47

REPORT OF ANALYSIS

Page: 2 of 6
Report No. RN1469334

Lab Reg No.		N25/010548	N25/010549	N25/010550	N25/010551	
Date Sampled		11-JUN-2025	11-JUN-2025	11-JUN-2025	11-JUN-2025	
Sample Reference		POR1A	POR1B	POR2	POR3	
	Units					Method
Total Recoverable Trace Elements by ICP						
Lead Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Manganese Total	ug/L	20	11	17	10	NT2_47
Molybdenum Total	ug/L	11	11	11	11	NT2_47
Nickel Total	ug/L	2.5	2.1	2.1	1.7	NT2_47
Silver Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Tin Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Vanadium Total	ug/L	5	4	3.8	3.4	NT2_47
Zinc Total	ug/L	2.4	1.8	1.5	1.3	NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1	< 0.1	< 0.1	< 0.1	NT2_44
Dates						
Date extracted		27-JUN-2025	27-JUN-2025	27-JUN-2025	27-JUN-2025	
Date analysed		30-JUN-2025	30-JUN-2025	30-JUN-2025	30-JUN-2025	

N25/010548

-N25/010551: Filtered sample metal results have been confirmed by repeat analysis.

Anamika Saha

Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

02-JUL-2025

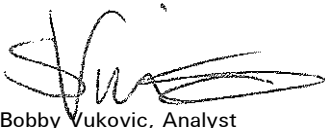
Lab Reg No.		N25/010548	N25/010549	N25/010550	N25/010551	
Date Sampled		11-JUN-2025	11-JUN-2025	11-JUN-2025	11-JUN-2025	
Sample Reference		POR1A	POR1B	POR2	POR3	
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	29	35	32	17	NW_S13
Dates						
Date extracted		26-JUN-2025	26-JUN-2025	26-JUN-2025	26-JUN-2025	
Date analysed		26-JUN-2025	26-JUN-2025	26-JUN-2025	26-JUN-2025	

REPORT OF ANALYSIS

Page: 3 of 6

Report No. RN1469334

Lab Reg No.		N25/010548	N25/010549	N25/010550	N25/010551	
Date Sampled		11-JUN-2025	11-JUN-2025	11-JUN-2025	11-JUN-2025	
Sample Reference		POR1A	POR1B	POR2	POR3	
	Units					Method



Bobby Vukovic, Analyst
Inorganics - NSW
Accreditation No. 198

02-JUL-2025

REPORT OF ANALYSIS

Page: 4 of 6

Report No. RN1469334

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680 Attention : FELICITY MELVILLE Project Name : For Follow up enquiries : ASB@measurement.gov.au	Job No. : VISIO5/250619 Quote No. : QT-02294 Order No. : Date Received : 19-JUN-2025 Sampled By : CLIENT Phone : 1300 722 845
--	--

Lab Reg No.	Sample Ref	Sample Description
N25/010552	FB5	SEAWATER 11/06/2025 12:00

Lab Reg No.		N25/010552				
Date Sampled		11-JUN-2025				
Sample Reference		FB5				
	Units					Method

Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	<5				NT2_47
Arsenic Filtered	ug/L	<1				NT2_47
Cadmium Filtered	ug/L	<0.1				NT2_47
Chromium Filtered	ug/L	<1				NT2_47
Cobalt Filtered	ug/L	<1				NT2_47
Copper Filtered	ug/L	<1				NT2_47
Gallium Filtered	ug/L	<1				NT2_47
Iron Filtered	ug/L	<5				NT2_47
Lead Filtered	ug/L	<1				NT2_47
Manganese Filtered	ug/L	<1				NT2_47
Molybdenum Filtered	ug/L	<1				NT2_47
Nickel Filtered	ug/L	<1				NT2_47
Silver Filtered	ug/L	<1				NT2_47
Tin Filtered	ug/L	<1				NT2_47
Vanadium Filtered	ug/L	<1				NT2_47
Zinc Filtered	ug/L	1.8				NT2_47

Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1				NT2_44

Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	<5				NT2_47
Arsenic Total	ug/L	<1				NT2_47
Cadmium Total	ug/L	<0.1				NT2_47
Chromium Total	ug/L	<1				NT2_47
Cobalt Total	ug/L	<1				NT2_47
Copper Total	ug/L	2.7				NT2_47
Gallium Total	ug/L	<1				NT2_47
Iron Total	ug/L	<5				NT2_47
Lead Total	ug/L	<1				NT2_47
Manganese Total	ug/L	<1				NT2_47
Molybdenum Total	ug/L	<1				NT2_47

REPORT OF ANALYSIS

Page: 5 of 6
Report No. RN1469334

Lab Reg No.		N25/010552				
Date Sampled		11-JUN-2025				
Sample Reference		FB5				
	Units					Method
Total Recoverable Trace Elements by ICP						
Nickel Total	ug/L	< 1				NT2_47
Silver Total	ug/L	< 1				NT2_47
Tin Total	ug/L	< 1				NT2_47
Vanadium Total	ug/L	< 1				NT2_47
Zinc Total	ug/L	< 1				NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1				NT2_44
Dates						
Date extracted		27-JUN-2025				
Date analysed		30-JUN-2025				

Anamika Saha

Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

02-JUL-2025

Lab Reg No.		N25/010552				
Date Sampled		11-JUN-2025				
Sample Reference		FB5				
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	< 2				NW_S13
Dates						
Date extracted		26-JUN-2025				
Date analysed		26-JUN-2025				

Bobby Vukovic

Bobby Vukovic, Analyst
Inorganics - NSW
Accreditation No. 198

02-JUL-2025

REPORT OF ANALYSIS

Page: 6 of 6
Report No. RN1469334

Total = acid extractable elements



WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

* Denotes the analyte or test method is not within our ISO/IEC 17025 scope of accreditation.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250619**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/010548			N25/010548	
Suspended Solids - Total	NW_S13	mg/L	2	<2	25	32	25	84	NA

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)
30/06/2025

Date:

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250619**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/010551				N25/010551
Aluminium Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	101	102
Arsenic Filtered	NT2_47	ug/L	1	<1	1.3	1.3	0	101	103
Cadmium Filtered	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	101	101
Chromium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	99	102
Cobalt Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	100	100
Copper Filtered	NT2_47	ug/L	1	<1	2.4	2.4	0	101	98
Gallium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	100
Iron Filtered	NT2_47	ug/L	5	<5	7.5	7.8	4	104	101
Lead Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	99
Manganese Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	106	97
Mercury - Filtered	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	101	97
Molybdenum Filtered	NT2_47	ug/L	1	<1	11	11	0	101	103
Nickel Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	98
Silver Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	100	99
Tin Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	102
Vanadium Filtered	NT2_47	ug/L	1	<1	1.9	1.9	0	100	103
Zinc Filtered	NT2_47	ug/L	1	<1	2.5	2.5	0	100	100
Aluminium Total	NT2_47	ug/L	5	<5	630	670	6	96	100
Arsenic Total	NT2_47	ug/L	1	<1	1.4	1.5	7	94	106
Cadmium Total	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	100	103
Chromium Total	NT2_47	ug/L	1	<1	1.6	1.6	0	98	103
Cobalt Total	NT2_47	ug/L	1	<1	<1	<1	NA	100	102
Copper Total	NT2_47	ug/L	1	<1	1.7	1.3	27	102	99
Gallium Total	NT2_47	ug/L	1	<1	<1	<1	NA	97	104
Iron Total	NT2_47	ug/L	5	<5	560	570	2	101	#
Lead Total	NT2_47	ug/L	1	<1	<1	<1	NA	105	100
Manganese Total	NT2_47	ug/L	1	<1	10	10	0	101	95
Mercury - Total	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	106	104
Molybdenum Total	NT2_47	ug/L	1	<1	11	11	0	94	104
Nickel Total	NT2_47	ug/L	1	<1	1.8	1.7	6	101	99
Silver Total	NT2_47	ug/L	1	<1	<1	<1	NA	103	100
Tin Total	NT2_47	ug/L	1	<1	<1	<1	NA	99	103

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Vanadium Total	NT2_47	ug/L	1	<1	3.2	3.7	14	95	106
Zinc Total	NT2_47	ug/L	1	<1	1.4	1.2	15	97	103
Inorganics Section					N25/010552			N25/010552	
Aluminium Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	101	101
Arsenic Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	100
Cadmium Filtered	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	101	99
Chromium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	99	100
Cobalt Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	100	99
Copper Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	100
Gallium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	99
Iron Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	104	97
Lead Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	101
Manganese Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	106	105
Mercury - Filtered	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	101	99
Molybdenum Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	100
Nickel Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	100
Silver Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	100	100
Tin Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	98
Vanadium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	100	100
Zinc Filtered	NT2_47	ug/L	1	<1	1.7	1.8	6	100	100
Aluminium Total	NT2_47	ug/L	5	<5	<5	<5	NA	96	97
Arsenic Total	NT2_47	ug/L	1	<1	<1	<1	NA	94	91
Cadmium Total	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	100	95
Chromium Total	NT2_47	ug/L	1	<1	<1	<1	NA	98	95
Cobalt Total	NT2_47	ug/L	1	<1	<1	<1	NA	100	98
Copper Total	NT2_47	ug/L	1	<1	2.7	2.8	4	102	100
Gallium Total	NT2_47	ug/L	1	<1	<1	<1	NA	97	95
Iron Total	NT2_47	ug/L	5	<5	<5	<5	NA	101	104
Lead Total	NT2_47	ug/L	1	<1	<1	<1	NA	105	100
Manganese Total	NT2_47	ug/L	1	<1	<1	<1	NA	101	101
Mercury - Total	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	106	103
Molybdenum Total	NT2_47	ug/L	1	<1	<1	<1	NA	94	91
Nickel Total	NT2_47	ug/L	1	<1	<1	<1	NA	101	99
Silver Total	NT2_47	ug/L	1	<1	<1	<1	NA	103	103
Tin Total	NT2_47	ug/L	1	<1	<1	<1	NA	99	93
Vanadium Total	NT2_47	ug/L	1	<1	<1	<1	NA	95	92
Zinc Total	NT2_47	ug/L	1	<1	<1	<1	NA	97	95

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)

Date:

30/06/2025



CERTIFICATE OF ANALYSIS

Work Order : **EB2520593**
Client : **VISION ENVIRONMENT ANZ**
Contact : FELICITY MELVILLE
Address : OFFICE 3 165 AUCKLAND STREET
GLADSTONE 4680
Telephone : ----
Project : PoR June 2025
Order number : ----
C-O-C number : ----
Sampler : ----
Site :
Quote number : BN/133/19 V4 PCIMP
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Kelly Schafer
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 4978 7944
Date Samples Received : 17-Jun-2025 10:30
Date Analysis Commenced : 19-Jun-2025
Issue Date : 23-Jun-2025 10:52



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>
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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 Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

				Sample ID	POR1A	POR1B	POR2	POR3	FB5
				Sampling date / time	11-Jun-2025 09:21	11-Jun-2025 09:21	11-Jun-2025 09:47	11-Jun-2025 09:36	11-Jun-2025 12:00
Compound	CAS Number	LOR	Unit		EB2520593-001	EB2520593-002	EB2520593-003	EB2520593-004	EB2520593-005
					Result	Result	Result	Result	Result
EP008CA: Chlorophyll a									
Chlorophyll a	----	0.02	µg/L		1.41	1.32	1.32	1.83	<0.02

Inter-Laboratory Testing

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

(WATER) EP008CA: Chlorophyll a



QUALITY CONTROL REPORT

Work Order	: EB2520593	Page	: 1 of 3
Client	: VISION ENVIRONMENT ANZ	Laboratory	: Environmental Division Brisbane
Contact	: FELICITY MELVILLE	Contact	: Kelly Schafer
Address	: OFFICE 3 165 AUCKLAND STREET GLADSTONE 4680	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 4978 7944
Project	: PoR June 2025	Date Samples Received	: 17-Jun-2025
Order number	: ----	Date Analysis Commenced	: 19-Jun-2025
C-O-C number	: ----	Issue Date	: 23-Jun-2025
Sampler	: ----		
Site	:		
Quote number	: BN/133/19 V4 PCIMP		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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 (%)
EP008CA: Chlorophyll a (QC Lot: 6660981)									
CA2503634-001	Anonymous	EP008: Chlorophyll a	----	0.02	µg/L	11.4	11.4	0.5	0% - 20%



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			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP008CA: Chlorophyll a (QCLot: 6660981)								
EP008: Chlorophyll a	----	0.02	µg/L	<0.02	200 µg/L	103	85.0	113

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.**

CERTIFICATE OF ANALYSIS

CLIENT : Vision Environment ANZ
(HVEC) 3/165 Auckland St
GLADSTONE QLD 4680
felicity@visionenvironment.com.au

ATTN: Felicity Melville

Laboratory Reference : SSP0094415
Client Order No. : MELVILLE_F
Quote Number : 24IN1001_F Melville
Client Batch Reference : POR June 2025
Date Received : 17-Jun-2025
Date Commenced : 20-Jun-2025
Laboratory Number/s : SS25KN3122-SS25KN3126

Number of Samples : 5

Reason for Analysis : Environmental Research

Method/s of Analysis : 13796 - Nitrogen (Ammonia) by Flow Injection Analysis
13798 - Nitrogen (Oxides) by Flow Injection Analysis
13799 - Phosphorus (Filterable Reactive) by Flow Injection Analysis
13800 - Phosphorus (Total) by Simultaneous Persulfate or Kjeldahl Digestion
13802 - Nitrogen (Total) by Simultaneous Persulfate Digestion
16628 - Total Organic Carbon by High Temperature Oxidation



SS25KN3122-SS25KN3126

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

Enquiries **Matthew Cross**
Phone **(+61 7) 3096 2805**
Email **matthew.cross@health.qld.gov.au**

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone **(+61) 1800 000 FSS (377)**
Fax **(+61 7) 3096 2977**
Email **FSS@health.qld.gov.au**

Client Reference				POR1A	POR1B	POR2	POR3
Sample Type				Seawater	Seawater	Seawater	Seawater
Sampling Time/Date				09:21 11-Jun-2025	09:21 11-Jun-2025	09:47 11-Jun-2025	09:36 11-Jun-2025
Sample Description							
Method	Nutrients	Units	Reporting Limit	SS25KN3122	SS25KN3123	SS25KN3124	SS25KN3125
13796	Ammonia	mg/L as N	0.002	0.004	0.002	0.003	0.003
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	0.015	0.014	0.010	0.011
13798	Nitrogen Oxides	mg/L as N	0.002	0.038	0.085	0.026	0.021
13800	Total Phosphorus	mg/L as P	0.003	0.039	0.030	0.035	0.027
13802	Total Nitrogen	mg/L as N	0.02	0.21	0.18	0.19	0.16
16628	Total Organic Carbon as NPOC	mg/L as C	1	3	3	3	3
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	2.2	2.0	1.8	1.8

Client Reference				FB5
Sample Type				Seawater
Sampling Time/Date				12:00 11-Jun-2025
Sample Description				
Method	Nutrients	Units	Reporting Limit	SS25KN3126
13796	Ammonia	mg/L as N	0.002	< 0.002
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	< 0.002
13798	Nitrogen Oxides	mg/L as N	0.002	< 0.002
13800	Total Phosphorus	mg/L as P	0.003	< 0.003
13802	Total Nitrogen	mg/L as N	0.02	< 0.02
16628	Total Organic Carbon as NPOC	mg/L as C	1	< 1.0
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	< 0.5

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).



NATA Accredited
Laboratory 41
Accredited for compliance
with ISO/IEC 17025 - Testing.

SS25KN3122-SS25KN3126

35025-24904 Printed: 15:32 30-Jun-25 mwcp1



REPORT OF ANALYSIS

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680	Job No. : VISIO5/250829/2
Attention : FELICITY MELVILLE	Quote No. : QT-02294
Project Name :	Order No. :
For Follow up enquiries : ASB@measurement.gov.au	Date Received : 29-AUG-2025
	Sampled By : CLIENT
	Phone : 1300 722 845

Lab Reg No.	Sample Ref	Sample Description
N25/014766	POR1	SEAWATER 26/08/2025 10:37
N25/014767	POR2A	SEAWATER 26/08/2025 10:13
N25/014768	POR2B	SEAWATER 26/08/2025 10:13
N25/014769	POR3	SEAWATER 26/08/2025 10:55

Lab Reg No.		N25/014766	N25/014767	N25/014768	N25/014769	
Date Sampled		26-AUG-2025	26-AUG-2025	26-AUG-2025	26-AUG-2025	
Sample Reference		POR1	POR2A	POR2B	POR3	
	Units					Method
Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	6.2	5.6	6.6	5.1	NT2_47
Arsenic Filtered	ug/L	1.1	1.1	1.1	1.1	NT2_47
Cadmium Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Cobalt Filtered	ug/L	<1	<1	<1	<1	NT2_47
Copper Filtered	ug/L	1.3	<1	2	1.4	NT2_47
Gallium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Iron Filtered	ug/L	<5	7.4	11	5.3	NT2_47
Lead Filtered	ug/L	<1	<1	<1	<1	NT2_47
Manganese Filtered	ug/L	<1	<1	<1	<1	NT2_47
Molybdenum Filtered	ug/L	11	11	11	11	NT2_47
Nickel Filtered	ug/L	<1	<1	<1	<1	NT2_47
Silver Filtered	ug/L	<1	<1	<1	<1	NT2_47
Tin Filtered	ug/L	1	1.1	1.1	<1	NT2_47
Vanadium Filtered	ug/L	1.8	1.7	1.8	1.7	NT2_47
Zinc Filtered	ug/L	1.2	2.5	2.3	1.9	NT2_47
Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	5350	7630	3200	3360	NT2_47
Arsenic Total	ug/L	2.2	2.7	1.9	1.9	NT2_47
Cadmium Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Total	ug/L	5.3	8.2	2.3	2.2	NT2_47
Cobalt Total	ug/L	1.4	1.8	<1	<1	NT2_47
Copper Total	ug/L	3	3.2	1.8	3	NT2_47
Gallium Total	ug/L	1.5	1.7	<1	<1	NT2_47
Iron Total	ug/L	2980	3950	1720	1740	NT2_47

REPORT OF ANALYSIS

Page: 2 of 6
Report No. RN1477365

Lab Reg No.		N25/014766	N25/014767	N25/014768	N25/014769	
Date Sampled		26-AUG-2025	26-AUG-2025	26-AUG-2025	26-AUG-2025	
Sample Reference		POR1	POR2A	POR2B	POR3	
	Units					Method
Total Recoverable Trace Elements by ICP						
Lead Total	ug/L	1.1	1.5	<1	<1	NT2_47
Manganese Total	ug/L	49	65	29	27	NT2_47
Molybdenum Total	ug/L	11	11	10	11	NT2_47
Nickel Total	ug/L	6	7.2	3.7	3.4	NT2_47
Silver Total	ug/L	<1	<1	<1	<1	NT2_47
Tin Total	ug/L	<1	<1	<1	<1	NT2_47
Vanadium Total	ug/L	8.8	11	5.7	6.2	NT2_47
Zinc Total	ug/L	9.3	9.1	5.7	4.5	NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Dates						
Date extracted		6-SEP-2025	6-SEP-2025	6-SEP-2025	6-SEP-2025	
Date analysed		8-SEP-2025	8-SEP-2025	8-SEP-2025	8-SEP-2025	

N25/014766

:Some high zinc and copper results in the filtered samples have been confirmed through repeat analysis.



Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

12-SEP-2025

Lab Reg No.		N25/014766	N25/014767	N25/014768	N25/014769	
Date Sampled		26-AUG-2025	26-AUG-2025	26-AUG-2025	26-AUG-2025	
Sample Reference		POR1	POR2A	POR2B	POR3	
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	78	56	42	20	NW_S13
Dates						
Date extracted		8-SEP-2025	8-SEP-2025	8-SEP-2025	8-SEP-2025	
Date analysed		8-SEP-2025	8-SEP-2025	8-SEP-2025	8-SEP-2025	

REPORT OF ANALYSIS

Page: 3 of 6

Report No. RN1477365

Lab Reg No.		N25/014766	N25/014767	N25/014768	N25/014769	
Date Sampled		26-AUG-2025	26-AUG-2025	26-AUG-2025	26-AUG-2025	
Sample Reference	Units	POR1	POR2A	POR2B	POR3	Method



Anupam Goswami, Analyst
Inorganics - NSW
Accreditation No. 198

12-SEP-2025

REPORT OF ANALYSIS

Page: 4 of 6

Report No. RN1477365

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680 Attention : FELICITY MELVILLE Project Name : For Follow up enquiries : ASB@measurement.gov.au	Job No. : VISIO5/250829/2 Quote No. : QT-02294 Order No. : Date Received : 29-AUG-2025 Sampled By : CLIENT Phone : 1300 722 845
--	--

Lab Reg No.	Sample Ref	Sample Description
N25/014770	FB5	SEAWATER 26/08/2025 11:10 FRESHWATER

Lab Reg No.		N25/014770				
Date Sampled		26-AUG-2025				
Sample Reference		FB5				
	Units					Method

Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	<5				NT2_47
Arsenic Filtered	ug/L	<1				NT2_47
Cadmium Filtered	ug/L	<0.1				NT2_47
Chromium Filtered	ug/L	<1				NT2_47
Cobalt Filtered	ug/L	<1				NT2_47
Copper Filtered	ug/L	<1				NT2_47
Gallium Filtered	ug/L	<1				NT2_47
Iron Filtered	ug/L	7.8				NT2_47
Lead Filtered	ug/L	<1				NT2_47
Manganese Filtered	ug/L	<1				NT2_47
Molybdenum Filtered	ug/L	<1				NT2_47
Nickel Filtered	ug/L	<1				NT2_47
Silver Filtered	ug/L	<1				NT2_47
Tin Filtered	ug/L	<1				NT2_47
Vanadium Filtered	ug/L	<1				NT2_47
Zinc Filtered	ug/L	2				NT2_47

Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1				NT2_44

Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	<5				NT2_47
Arsenic Total	ug/L	<1				NT2_47
Cadmium Total	ug/L	<0.1				NT2_47
Chromium Total	ug/L	<1				NT2_47
Cobalt Total	ug/L	<1				NT2_47
Copper Total	ug/L	<1				NT2_47
Gallium Total	ug/L	<1				NT2_47
Iron Total	ug/L	<5				NT2_47
Lead Total	ug/L	<1				NT2_47
Manganese Total	ug/L	<1				NT2_47
Molybdenum Total	ug/L	<1				NT2_47

REPORT OF ANALYSIS

Page: 5 of 6
Report No. RN1477365

Lab Reg No.		N25/014770				
Date Sampled		26-AUG-2025				
Sample Reference		FB5				
	Units					Method
Total Recoverable Trace Elements by ICP						
Nickel Total	ug/L	< 1				NT2_47
Silver Total	ug/L	< 1				NT2_47
Tin Total	ug/L	< 1				NT2_47
Vanadium Total	ug/L	< 1				NT2_47
Zinc Total	ug/L	1.1				NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1				NT2_44
Dates						
Date extracted		6-SEP-2025				
Date analysed		8-SEP-2025				

Anamika Saha

Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

12-SEP-2025

Lab Reg No.		N25/014770				
Date Sampled		26-AUG-2025				
Sample Reference		FB5				
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	< 2				NW_S13
Dates						
Date extracted		8-SEP-2025				
Date analysed		8-SEP-2025				

Anupam Goswami

Anupam Goswami, Analyst
Inorganics - NSW
Accreditation No. 198

12-SEP-2025

REPORT OF ANALYSIS

Page: 6 of 6
Report No. RN1477365



WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

* Denotes the analyte or test method is not within our ISO/IEC 17025 scope of accreditation.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.

Unless otherwise stated, all biota/food results are reported on a wet weight basis.

The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250829/2**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/014769				N25/014769
Aluminium Filtered	NT2_47	ug/L	5	<5	6.1	<5	NA	97	102
Arsenic Filtered	NT2_47	ug/L	1	<1	1.2	1.1	9	95	101
Cadmium Filtered	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	102	99
Chromium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	93	101
Cobalt Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	95	100
Copper Filtered	NT2_47	ug/L	1	<1	1.4	1.4	0	98	99
Gallium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	94	103
Iron Filtered	NT2_47	ug/L	5	<5	5.3	5.3	0	94	103
Lead Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	97	97
Manganese Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	92	101
Mercury - Filtered	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	105	102
Molybdenum Filtered	NT2_47	ug/L	1	<1	11	11	0	96	100
Nickel Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	97	99
Silver Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	103	96
Tin Filtered	NT2_47	ug/L	1	<1	1	<1	NA	94	98
Vanadium Filtered	NT2_47	ug/L	1	<1	1.7	1.7	0	92	101
Zinc Filtered	NT2_47	ug/L	1	<1	1.8	2	11	101	101
Aluminium Total	NT2_47	ug/L	5	<5	3310	3420	3	103	103
Arsenic Total	NT2_47	ug/L	1	<1	1.9	1.9	0	104	103
Cadmium Total	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	98	99
Chromium Total	NT2_47	ug/L	1	<1	2.2	2.2	0	102	103
Cobalt Total	NT2_47	ug/L	1	<1	<1	<1	NA	104	103
Copper Total	NT2_47	ug/L	1	<1	2.8	3.1	10	102	102
Gallium Total	NT2_47	ug/L	1	<1	<1	<1	NA	105	100
Iron Total	NT2_47	ug/L	5	<5	1720	1760	2	102	#
Lead Total	NT2_47	ug/L	1	<1	<1	<1	NA	101	101
Manganese Total	NT2_47	ug/L	1	<1	27	28	4	106	101
Mercury - Total	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	98	92
Molybdenum Total	NT2_47	ug/L	1	<1	11	10	10	103	101
Nickel Total	NT2_47	ug/L	1	<1	3.5	3.4	3	103	103
Silver Total	NT2_47	ug/L	1	<1	<1	<1	NA	98	102
Tin Total	NT2_47	ug/L	1	<1	<1	<1	NA	104	102

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Vanadium Total	NT2_47	ug/L	1	<1	6.4	5.9	8	107	104
Zinc Total	NT2_47	ug/L	1	<1	3.8	5.1	29	97	101

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)

Date:

10/09/2025

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/250829/2**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/014766			N25/014766	
Suspended Solids - Total	NW_S13	mg/L	2	<2	79	77	3	80	NA

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans

Date:

Inorganics, NMI (North Ryde)

12/09/2025



CERTIFICATE OF ANALYSIS

Work Order : **EB2530209**
Client : **VISION ENVIRONMENT ANZ**
Contact : FELICITY MELVILLE
Address : OFFICE 3 165 AUCKLAND STREET
GLADSTONE 4680
Telephone : ----
Project : POR June 2025
Order number : ----
C-O-C number : ----
Sampler : Anna Skillington
Site :
Quote number : BN/133/19 V4 PCIMP
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Kelly Schafer
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 4978 7944
Date Samples Received : 03-Sep-2025 12:00
Date Analysis Commenced : 04-Sep-2025
Issue Date : 04-Sep-2025 14:03



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>
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



Page : 2 of 2
 Work Order : EB2530209
 Client : VISION ENVIRONMENT ANZ
 Project : POR June 2025

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 Results

Sub-Matrix: WATER
 (Matrix: WATER)

				Sample ID	POR1	POR2A	POR2B	POR3	FB5
				Sampling date / time	26-Aug-2025 10:37	26-Aug-2025 10:13	26-Aug-2025 10:13	26-Aug-2025 10:55	26-Aug-2025 11:10
Compound	CAS Number	LOR	Unit		EB2530209-001	EB2530209-002	EB2530209-003	EB2530209-004	EB2530209-005
					Result	Result	Result	Result	Result
EP008CA: Chlorophyll a									
Chlorophyll a	----	0.02	µg/L		2.17	1.17	1.52	1.07	<0.02

Inter-Laboratory Testing

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

(WATER) EP008CA: Chlorophyll a



QUALITY CONTROL REPORT

Work Order	: EB2530209	Page	: 1 of 3
Client	: VISION ENVIRONMENT ANZ	Laboratory	: Environmental Division Brisbane
Contact	: FELICITY MELVILLE	Contact	: Kelly Schafer
Address	: OFFICE 3 165 AUCKLAND STREET GLADSTONE 4680	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 4978 7944
Project	: POR June 2025	Date Samples Received	: 03-Sep-2025
Order number	: ----	Date Analysis Commenced	: 04-Sep-2025
C-O-C number	: ----	Issue Date	: 04-Sep-2025
Sampler	: Anna Skillington		
Site	:		
Quote number	: BN/133/19 V4 PCIMP		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP008CA: Chlorophyll a (QCLot: 6835301)								
EP008: Chlorophyll a	----	0.02	µg/L	<0.02	200 µg/L	99.2	85.0	113

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.**

CERTIFICATE OF ANALYSIS

CLIENT : Vision Environment ANZ
(HVEC) 3/165 Auckland St
GLADSTONE QLD 4680
felicity@visionenvironment.com.au

ATTN: Felicity Melville

Laboratory Reference : SSP0095480
Client Order No. : MELVILLE_F
Quote Number : 24IN1001_F Melville
Client Batch Reference : POR August 2025
Date Received : 03-Sep-2025
Date Commenced : 05-Sep-2025
Laboratory Number/s : SS25KN4415-SS25KN4419

Number of Samples : 5

Reason for Analysis : Environmental Research

Method/s of Analysis : 13796 - Nitrogen (Ammonia) by Flow Injection Analysis
13798 - Nitrogen (Oxides) by Flow Injection Analysis
13799 - Phosphorus (Filterable Reactive) by Flow Injection Analysis
13800 - Phosphorus (Total) by Simultaneous Persulfate or Kjeldahl Digestion
13802 - Nitrogen (Total) by Simultaneous Persulfate Digestion
16628 - Total Organic Carbon by High Temperature Oxidation



SS25KN4415-SS25KN4419

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

Enquiries **Jane Pullar**
Phone **(+61 7) 30962807**
Email **jane.pullar@health.qld.gov.au**

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone **(+61) 1800 000 FSS (377)**
Fax **(+61 7) 3096 2977**
Email **FSS@health.qld.gov.au**

Client Reference				POR1	POR2A	POR2B	POR3
Sample Type				Water	Water	Water	Water
Sampling Time/Date				10:37 26-Aug-2025	10:13 26-Aug-2025	10:13 26-Aug-2025	10:55 26-Aug-2025
Sample Description							
Method	Nutrients	Units	Reporting Limit	SS25KN4415	SS25KN4416	SS25KN4417	SS25KN4418
13796	Ammonia	mg/L as N	0.002	0.003	0.003	0.002	0.007
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	0.010	0.010	0.007	0.008
13798	Nitrogen Oxides	mg/L as N	0.002	0.017	0.023	0.014	0.057
13800	Total Phosphorus	mg/L as P	0.003	0.062	0.082	0.039	0.038
13802	Total Nitrogen	mg/L as N	0.02	0.22	0.25	0.18	0.17
16628	Total Organic Carbon as NPOC	mg/L as C	1	2	2	1	1
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	0.9	1.0	0.8	0.9

Client Reference				FB5
Sample Type				Water
Sampling Time/Date				11:10 26-Aug-2025
Sample Description				
Method	Nutrients	Units	Reporting Limit	SS25KN4419
13796	Ammonia	mg/L as N	0.002	0.005
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	< 0.002
13798	Nitrogen Oxides	mg/L as N	0.002	< 0.002
13800	Total Phosphorus	mg/L as P	0.003	< 0.003
13802	Total Nitrogen	mg/L as N	0.02	< 0.02
16628	Total Organic Carbon as NPOC	mg/L as C	1	< 1
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	< 0.5

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).





REPORT OF ANALYSIS

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680	Job No. : VISIO5/251121/1 Quote No. : QT-02294 Order No. :
Attention : FELICITY MELVILLE	Date Received : 21-NOV-2025
Project Name :	Sampled By : CLIENT
For Follow up enquiries : ASB@measurement.gov.au	Phone : 1300 722 845

Lab Reg No.	Sample Ref	Sample Description
N25/019910	POR1	SEAWATER 18/11/2025 7:33
N25/019911	POR2	SEAWATER 18/11/2025 7:51
N25/019912	POR3A	SEAWATER 18/11/2025 7:07
N25/019913	POR3B	SEAWATER 18/11/2025 7:07

Lab Reg No.		N25/019910	N25/019911	N25/019912	N25/019913	
Date Sampled		18-NOV-2025	18-NOV-2025	18-NOV-2025	18-NOV-2025	
Sample Reference		POR1	POR2	POR3A	POR3B	
	Units					Method
Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	<5	5.3	<5	<5	NT2_47
Arsenic Filtered	ug/L	1.1	1.2	1.2	1.2	NT2_47
Cadmium Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Cobalt Filtered	ug/L	<1	<1	<1	<1	NT2_47
Copper Filtered	ug/L	1.5	1.4	1.4	1.2	NT2_47
Gallium Filtered	ug/L	<1	<1	<1	<1	NT2_47
Iron Filtered	ug/L	7.5	<5	<5	<5	NT2_47
Lead Filtered	ug/L	<1	<1	<1	<1	NT2_47
Manganese Filtered	ug/L	<1	<1	<1	<1	NT2_47
Molybdenum Filtered	ug/L	11	11	12	11	NT2_47
Nickel Filtered	ug/L	<1	<1	<1	<1	NT2_47
Silver Filtered	ug/L	<1	<1	<1	<1	NT2_47
Tin Filtered	ug/L	<1	<1	<1	<1	NT2_47
Vanadium Filtered	ug/L	2.2	2.1	2	2	NT2_47
Zinc Filtered	ug/L	2	1.6	2.4	1.1	NT2_47
Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	3550	1320	3160	2850	NT2_47
Arsenic Total	ug/L	2.2	1.5	2.2	2	NT2_47
Cadmium Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_47
Chromium Total	ug/L	5.7	2.3	4.4	4.9	NT2_47
Cobalt Total	ug/L	1.4	<1	1.2	1.2	NT2_47
Copper Total	ug/L	2.8	1.7	4.1	1.8	NT2_47
Gallium Total	ug/L	<1	<1	<1	1	NT2_47

REPORT OF ANALYSIS

Page: 2 of 6
Report No. RN1483639

Lab Reg No.		N25/019910	N25/019911	N25/019912	N25/019913	
Date Sampled		18-NOV-2025	18-NOV-2025	18-NOV-2025	18-NOV-2025	
Sample Reference		POR1	POR2	POR3A	POR3B	
	Units					Method
Total Recoverable Trace Elements by ICP						
Iron Total	ug/L	2840	1140	2330	2480	NT2_47
Lead Total	ug/L	< 1	< 1	1	1.1	NT2_47
Manganese Total	ug/L	56	19	43	44	NT2_47
Molybdenum Total	ug/L	11	11	11	11	NT2_47
Nickel Total	ug/L	5.8	2.2	4.5	4.2	NT2_47
Silver Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Tin Total	ug/L	< 1	< 1	< 1	< 1	NT2_47
Vanadium Total	ug/L	8.2	4.3	6.4	7	NT2_47
Zinc Total	ug/L	5.9	3.8	6.9	2.8	NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	<0.1	<0.1	<0.1	<0.1	NT2_44
Dates						
Date extracted		27-NOV-2025	27-NOV-2025	27-NOV-2025	27-NOV-2025	
Date analysed		1-DEC-2025	1-DEC-2025	1-DEC-2025	1-DEC-2025	

N25/019910

For some samples high filtered zinc, copper and iron results have been confirmed by repeat analysis.



Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

02-DEC-2025

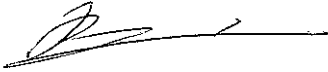
Lab Reg No.		N25/019910	N25/019911	N25/019912	N25/019913	
Date Sampled		18-NOV-2025	18-NOV-2025	18-NOV-2025	18-NOV-2025	
Sample Reference		POR1	POR2	POR3A	POR3B	
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	77	31	94	85	NW_S13
Dates						
Date extracted		26-NOV-2025	26-NOV-2025	26-NOV-2025	26-NOV-2025	
Date analysed		27-NOV-2025	27-NOV-2025	27-NOV-2025	27-NOV-2025	

REPORT OF ANALYSIS

Page: 3 of 6

Report No. RN1483639

Lab Reg No.		N25/019910	N25/019911	N25/019912	N25/019913	
Date Sampled		18-NOV-2025	18-NOV-2025	18-NOV-2025	18-NOV-2025	
Sample Reference	Units	POR1	POR2	POR3A	POR3B	Method



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

02-DEC-2025

REPORT OF ANALYSIS

Page: 4 of 6

Report No. RN1483639

Client : VISION ENVIRONMENT PTY LTD (QLD) U3 / 165 AUCKLAND STREET GLADSTONE CENTRAL QLD 4680	Job No. : VISIO5/251121/1 Quote No. : QT-02294 Order No. : Date Received : 21-NOV-2025 Sampled By : CLIENT
Attention : FELICITY MELVILLE Project Name : For Follow up enquiries : ASB@measurement.gov.au	Phone : 1300 722 845

Lab Reg No.	Sample Ref	Sample Description
N25/019914	FB5	SEAWATER 18/11/2025 7:55

Lab Reg No.		N25/019914				
Date Sampled		18-NOV-2025				
Sample Reference		FB5				
	Units					Method
Filtered Trace Elements by ICP						
Aluminium Filtered	ug/L	<5				NT2_47
Arsenic Filtered	ug/L	<1				NT2_47
Cadmium Filtered	ug/L	<0.1				NT2_47
Chromium Filtered	ug/L	<1				NT2_47
Cobalt Filtered	ug/L	<1				NT2_47
Copper Filtered	ug/L	<1				NT2_47
Gallium Filtered	ug/L	<1				NT2_47
Iron Filtered	ug/L	<5				NT2_47
Lead Filtered	ug/L	<1				NT2_47
Manganese Filtered	ug/L	<1				NT2_47
Molybdenum Filtered	ug/L	<1				NT2_47
Nickel Filtered	ug/L	<1				NT2_47
Silver Filtered	ug/L	<1				NT2_47
Tin Filtered	ug/L	<1				NT2_47
Vanadium Filtered	ug/L	<1				NT2_47
Zinc Filtered	ug/L	1.6				NT2_47
Filtered Mercury by CV-AAS						
Mercury - Filtered	ug/L	<0.1				NT2_44
Total Recoverable Trace Elements by ICP						
Aluminium Total	ug/L	<5				NT2_47
Arsenic Total	ug/L	<1				NT2_47
Cadmium Total	ug/L	<0.1				NT2_47
Chromium Total	ug/L	<1				NT2_47
Cobalt Total	ug/L	<1				NT2_47
Copper Total	ug/L	<1				NT2_47
Gallium Total	ug/L	<1				NT2_47
Iron Total	ug/L	<5				NT2_47
Lead Total	ug/L	<1				NT2_47
Manganese Total	ug/L	<1				NT2_47

REPORT OF ANALYSIS

Page: 5 of 6
Report No. RN1483639

Lab Reg No.		N25/019914				
Date Sampled		18-NOV-2025				
Sample Reference		FB5				
	Units					Method
Total Recoverable Trace Elements by ICP						
Molybdenum Total	ug/L	< 1				NT2_47
Nickel Total	ug/L	< 1				NT2_47
Silver Total	ug/L	< 1				NT2_47
Tin Total	ug/L	< 1				NT2_47
Vanadium Total	ug/L	< 1				NT2_47
Zinc Total	ug/L	< 1				NT2_47
Total Recoverable Mercury by CV-AAS						
Mercury - Total	ug/L	< 0.1				NT2_44
Dates						
Date extracted		27-NOV-2025				
Date analysed		1-DEC-2025				

Anamika Saha

Anamika Saha, Analyst
Inorganics - NSW
Accreditation No. 198

02-DEC-2025

Lab Reg No.		N25/019914				
Date Sampled		18-NOV-2025				
Sample Reference		FB5				
	Units					Method
Miscellaneous						
Suspended Solids - Total	mg/L	< 2				NW_S13
Dates						
Date extracted		26-NOV-2025				
Date analysed		27-NOV-2025				

Wei Huang

Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

02-DEC-2025

REPORT OF ANALYSIS

Page: 6 of 6
Report No. RN1483639



WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

NA - Test Not Required

* Denotes the analyte or test method is not within our ISO/IEC 17025 scope of accreditation.

Measurement Uncertainty is available upon request.

Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.

Unless otherwise stated, all biota/food results are reported on a wet weight basis.

Note: Sampling date(s) have been provided by the client.

The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/251121/1**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/019910			N25/019910	
Suspended Solids - Total	NW_S13	mg/L	2	<2	77	NA	NA	96	NA

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)
01/12/2025

Date:

QUALITY ASSURANCE REPORT

Client: **VISION ENVIRONMENT PTY LTD (QLD)**
QA Report No: **VISI05/251121/1**

Matrix: Water

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Inorganics Section					N25/019913				N25/019913
Aluminium Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	90	103
Arsenic Filtered	NT2_47	ug/L	1	<1	1.2	1.2	0	103	106
Cadmium Filtered	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	102	99
Chromium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	98
Cobalt Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	102	106
Copper Filtered	NT2_47	ug/L	1	<1	1.2	1.1	9	102	105
Gallium Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	101	107
Iron Filtered	NT2_47	ug/L	5	<5	<5	<5	NA	100	107
Lead Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	99	95
Manganese Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	99	98
Mercury - Filtered	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	106	103
Molybdenum Filtered	NT2_47	ug/L	1	<1	11	11	0	100	103
Nickel Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	102	104
Silver Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	92	99
Tin Filtered	NT2_47	ug/L	1	<1	<1	<1	NA	99	100
Vanadium Filtered	NT2_47	ug/L	1	<1	2	1.9	5	101	110
Zinc Filtered	NT2_47	ug/L	1	<1	1.1	<1	NA	100	100
Aluminium Total	NT2_47	ug/L	5	<5	2830	2860	1	104	94
Arsenic Total	NT2_47	ug/L	1	<1	2	2	0	100	97
Cadmium Total	NT2_47	ug/L	0.1	<0.1	<0.1	<0.1	NA	100	100
Chromium Total	NT2_47	ug/L	1	<1	4.6	5.2	12	100	98
Cobalt Total	NT2_47	ug/L	1	<1	1.2	1.2	0	100	99
Copper Total	NT2_47	ug/L	1	<1	1.3	2.2	51	99	97
Gallium Total	NT2_47	ug/L	1	<1	<1	1.1	NA	101	99
Iron Total	NT2_47	ug/L	5	<5	2260	2690	17	99	93
Lead Total	NT2_47	ug/L	1	<1	1.1	1.1	0	99	103
Manganese Total	NT2_47	ug/L	1	<1	44	44	0	101	99
Mercury - Total	NT2_44	ug/L	0.1	<0.1	<0.1	<0.1	NA	104	97
Molybdenum Total	NT2_47	ug/L	1	<1	11	11	0	100	101
Nickel Total	NT2_47	ug/L	1	<1	4.3	4.2	2	99	98
Silver Total	NT2_47	ug/L	1	<1	<1	<1	NA	87	98
Tin Total	NT2_47	ug/L	1	<1	<1	<1	NA	100	103

Analyte	Method	Units	LOR	Blank	Duplicates			Recoveries	
					Sample	Duplicate	RPD	LCS	Matrix Spike
							%	%	%
Vanadium Total	NT2_47	ug/L	1	<1	6.5	7.5	14	101	100
Zinc Total	NT2_47	ug/L	1	<1	3	2.6	14	98	100

LOR = Limit Of Reporting RPD = Relative Percent Difference LCS = Laboratory Control Sample NA = Not Applicable

Acceptable recoveries for the LCS and Matrix Spike are 80 - 120%.

Acceptable RPDs on duplicates is 30 % at concentrations more than 5 times LOR. Greater RPD may be expected at less than 5 times LOR.

#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

** : reference value not available

Signed:



Dr Andrew Evans
Inorganics, NMI (North Ryde)

Date:

02/12/2025



CERTIFICATE OF ANALYSIS

Work Order : **EB2540889**
Client : **VISION ENVIRONMENT ANZ**
Contact : FELICITY MELVILLE
Address : OFFICE 3 165 AUCKLAND STREET
GLADSTONE 4680
Telephone : ----
Project : PoR November 2025
Order number : ----
C-O-C number : ----
Sampler : ----
Site :
Quote number : BN/133/19 V4 PCIMP
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2
Laboratory : Environmental Division Brisbane
Contact : Kelly Schafer
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61 7 4978 7944
Date Samples Received : 20-Nov-2025 10:00
Date Analysis Commenced : 25-Nov-2025
Issue Date : 26-Nov-2025 15:25



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>
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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 Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

				Sample ID	POR1	POR2	POR3A	POR3B	FB5
				Sampling date / time	18-Nov-2025 07:33	18-Nov-2025 07:51	18-Nov-2025 07:07	18-Nov-2025 07:07	18-Nov-2025 07:55
Compound	CAS Number	LOR	Unit		EB2540889-001	EB2540889-002	EB2540889-003	EB2540889-004	EB2540889-005
					Result	Result	Result	Result	Result
EP008CA: Chlorophyll a									
Chlorophyll a	----	0.02	µg/L		1.88	1.46	1.87	2.12	<0.02

Inter-Laboratory Testing

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

(WATER) EP008CA: Chlorophyll a



QUALITY CONTROL REPORT

Work Order	: EB2540889	Page	: 1 of 3
Client	: VISION ENVIRONMENT ANZ	Laboratory	: Environmental Division Brisbane
Contact	: FELICITY MELVILLE	Contact	: Kelly Schafer
Address	: OFFICE 3 165 AUCKLAND STREET GLADSTONE 4680	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 7 4978 7944
Project	: PoR November 2025	Date Samples Received	: 20-Nov-2025
Order number	: ----	Date Analysis Commenced	: 25-Nov-2025
C-O-C number	: ----	Issue Date	: 26-Nov-2025
Sampler	: ----		
Site	:		
Quote number	: BN/133/19 V4 PCIMP		
No. of samples received	: 5		
No. of samples analysed	: 5		



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
Don Sirimanne	Senior Biologist - Water	Canberra Water Microbiology / Biology, Hume, ACT



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.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound		CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EP008CA: Chlorophyll a (QCLot: 7029014)									
EP008: Chlorophyll a		----	0.02	µg/L	<0.02	200 µg/L	104	85.0	113

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.**

CERTIFICATE OF ANALYSIS

CLIENT : Vision Environment ANZ
(HVEC) 3/165 Auckland St
GLADSTONE QLD 4680
felicity@visionenvironment.com.au

ATTN: Felicity Melville

Laboratory Reference : SSP0096714
Client Order No. : MELVILLE_F
Quote Number : 24IN1001_F MELVILLE
Client Batch Reference : POR NOVEMBER 2025
Date Received : 20-Nov-2025
Date Commenced : 25-Nov-2025
Laboratory Number/s : SS25KN6263-SS25KN6267


Number of Samples : 5

Reason for Analysis : Environmental Research

Method/s of Analysis : 13796 - Nitrogen (Ammonia) by Flow Injection Analysis
13798 - Nitrogen (Oxides) by Flow Injection Analysis
13799 - Phosphorus (Filterable Reactive) by Flow Injection Analysis
13800 - Phosphorus (Total) by Simultaneous Persulfate or Kjeldahl Digestion
13802 - Nitrogen (Total) by Simultaneous Persulfate Digestion
16628 - Total Organic Carbon by High Temperature Oxidation



SS25KN6263-SS25KN6267



Matthew Cross
Laboratory Technician, Inorganic Chemistry
02-Dec-2025

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).

Enquiries **Matthew Cross**
Phone **(+61 7) 3096 2805**
Email **matthew.cross@health.qld.gov.au**

39 Kessels Road
Coopers Plains QLD 4108
AUSTRALIA

PO Box 594
Archerfield QLD 4108
AUSTRALIA

Phone **(+61) 1800 000 FSS (377)**
Fax **(+61 7) 3096 2977**
Email **FSS@health.qld.gov.au**

Client Reference				POR1	POR2	POR3A	POR3B
Sample Type				Water Sea Filtered	Water Sea Filtered	Water Sea Filtered	Water Sea Filtered
Sampling Time/Date				07:33 18-Nov-2025	07:51 18-Nov-2025	07:07 18-Nov-2025	07:07 18-Nov-2025
Sample Description							
Method	Nutrients	Units	Reporting Limit	SS25KN6263	SS25KN6264	SS25KN6265	SS25KN6266
13796	Ammonia	mg/L as N	0.002	< 0.002	< 0.002	< 0.002	< 0.002
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	0.012	0.011	0.010	0.009
13798	Nitrogen Oxides	mg/L as N	0.002	0.040	0.038	0.031	0.032
13800	Total Phosphorus	mg/L as P	0.003	0.067	0.035	0.054	0.054
13802	Total Nitrogen	mg/L as N	0.02	0.24	0.17	0.21	0.21
16628	Total Organic Carbon as NPOC	mg/L as C	1	2	2	2	2
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	1.0	1.0	1.0	1.0

Client Reference				FB5
Sample Type				Water Sea Filtered
Sampling Time/Date				07:55 18-Nov-2025
Sample Description				
Method	Nutrients	Units	Reporting Limit	SS25KN6267
13796	Ammonia	mg/L as N	0.002	0.003
13799	Filterable Reactive Phosphorus	mg/L as P	0.002	< 0.002
13798	Nitrogen Oxides	mg/L as N	0.002	< 0.002
13800	Total Phosphorus	mg/L as P	0.003	< 0.003
13802	Total Nitrogen	mg/L as N	0.02	< 0.02
16628	Total Organic Carbon as NPOC	mg/L as C	1	< 1
16628	Dissolved Organic Carbon as NPOC	mg/L as C	0.5	< 0.5

This report overrides all previous reports. The results relate solely to the sample/s as received and are limited to the specific tests undertaken as listed on the report. The results on this report are confidential and are not to be used or disclosed to any other person or used for any other purpose, whether directly or indirectly, unless that use is disclosed or the purpose is expressly authorised in writing by Queensland Health and the named recipient on this report. To the fullest extent permitted by law, Queensland Health will not be liable for any loss or claim (including legal costs calculated on an indemnity basis) which arise because of (a) problems related to the merchantability, fitness or quality of the sample/s, or (b) any negligent or unlawful act or omissions by Queensland Health that is connected with any activities or services provided by Queensland Health under this agreement (including the timing and/or method under which the sample/s were taken, stored or transported).



NATA Accredited
Laboratory 41
Accredited for compliance
with ISO/IEC 17025 - Testing.

SS25KN6263-SS25KN6267

35270-41360 Printed: 10:47 02-Dec-25 mwcp1



Confidential report
CAR2724

Details			
Number CAR2724	Status Open	Owner Blake, Nick	Raised Date 12/12/2025
Source Customer Complaint	Target Date 10/03/2026		
Raised By Person Evans, Andrew	Risk Rating 3. Medium	Raised Against (Department or Supplier) NMI\ASB\INORGANICS	
Audit			
Details Vision questioned copper results for PCIMP sampling in June, August and November 2025, observing a significant number of dissolved copper results higher than total copper results.			
Closed By	Closed Date		
Immediate Corrective Action			
Target Date 15/12/2025	Owner Evans, Andrew	Closed Date 9/01/2026	Closed By Evans, Andrew
Details All Vision PCIMP results from June, August and November 2025 were reviewed. * The data was correctly processed and reported, and quality controls were all acceptable. * Reagent blanks and instrument blanks were all low, and duplicates were in good agreement with each other. * Repeat analysis of samples with high dissolved copper gave results in good agreement with the original reported results. * In conclusion, there was no evidence of errors with preparation, analysis or data processing. * Although most copper results were very low (less than 5 times LOR), high MU cannot fully explain the observed results.			
Actions			
Number	Owner	Target Date	Completed Date
Details		Response	
1	Evans, Andrew	15/12/2025	9/01/2026
Determine the formal risk rating for this non-conformance in accordance with the NMI Quality Risk Reference Card. If the risk is rated as Medium then notify the relevant Branch General Manager. If the risk is rated as High or Very High then notify the CEO and the relevant Branch General Manager.		Risk is determined to be Medium, as Vision are a major client for the section.	
Investigation			
Target Date 2/01/2026	Owner Evans, Andrew	Closed Date 9/01/2026	Closed By Evans, Andrew
Details Following this review, we investigated the bottles (sent from NMI to Vision for sampling). * NMI changed bottle supplier in March 2025, before which there were no issues with copper contamination. * Bottles from the new supplier (Cospac) were checked for copper, but using bottles from a freshly opened bag. * Bottles from Cospac are not closed (the bottled and lids are supplied separately), so there could be contamination here. * Twelve blank bottles were tested for copper, and there was significant contamination of more than 1 ppb in a number of bottles. * We have rechecked acids and dispensers used in preparing the bottles for Vision, and these were all clean.			

Actions			
Number	Owner	Target Date	Completed Date
Details		Response	

Root Cause			
Target Date	Owner	Closed Date	Closed By
3/01/2026	Evans, Andrew	9/01/2026	Evans, Andrew
Details			
The bottles (or rather dust in the bottles) are the source of copper contamination.			

Actions			
Number	Owner	Target Date	Completed Date
Details		Response	

Long Term Corrective Action			
Target Date	Owner	Closed Date	Closed By
21/01/2026	Evans, Andrew	9/01/2026	Evans, Andrew
Details			
It is proposed to modify the process for preparing bottles for clients - to cap immediately upon opening a new bag of bottles and caps, and to perform acid addition in a cleaner environment. For every batch of bottles prepared for clients, 4 bottles will be sent for testing for metal contamination. Only if the metal contaminants are below LOR will bottles be sent to clients.			

Actions			
Number	Owner	Target Date	Completed Date
Details		Response	

Monitoring Corrective Action			
Target Date	Owner	Closed Date	Closed By
10/02/2026	Evans, Andrew	3/02/2026	Evans, Andrew
Details			
<p>Procedure for the preparation of bottles for metals testing:</p> <ol style="list-style-type: none"> 1. Ensure all operations are performed in a clean environment – wipe down benches, wear gloves and a clean lab coat. 2. Open a new bag of bottles and lids. Cap all 100 bottles immediately to prevent possible contamination. 3. Later, add 2 mL nitric acid (1 part concentrated nitric acid plus 3 parts milliQ water) to each individual bottle. 4. Register a job in SMW and pass 4 bottles to Trace Elements for testing. 5. Only once bottles are confirmed as clean can they be supplied to clients. <p>LS staff have been trained in this procedure.</p> <p>This procedure was followed for two batches of bottles - jobs NMI01/260114 and NMI01/260129. All metals results were less than LOR.</p>			

Actions			
Number	Owner	Target Date	Completed Date
Details		Response	