Remote Annual Monitoring Report 2025 -2026

Waste Discharge Licences for Remote Waste Stabilisation Ponds

Reporting period: 1 July 2025 – 30 June 2026

PowerWater

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Glossary

Abbreviation	Definition
ANZECC	Australian and New Zealand Environment and Conservation Council
BOD	Biochemical oxygen demand
Chl-a	Chlorophyll-a, a photosynthetic pigment present in plants, algae and cyanobacteria that is used in oxygenic photosynthesis. It can be used as a measure of algal biomass and subsequently primary production
DLPE	Department of Lands, Planning and Environment
DHWQO(s)	Darwin Harbour water quality objective(s)
DO	Dissolved oxygen
EC	Electrical conductivity
E. coli	*Escherichia coli*
EP	Equivalent population
ET	Equivalent tenement - calculation utilised in remote communities for an average residential dwelling or house (Indigenous Community Engineering Guidelines 2017)
ERA	Environmental risk assessment
FRP	Filterable reactive phosphorous (orthophosphate)
kL	Kilolitres
LOR	Limit of reporting for chemical analysis
µg	Micrograms
mg	Milligrams
ML	Mega litres
N	Nitrogen
NH_3-N	Total ammonia as N (NH_3 and $NH4^+$ as N) as per ANZECC and ARMCANZ (2000)
NO_X-N	Oxidised nitrogen as N – the sum of nitrate and nitrite
NT	Northern Territory
NT EPA	Northern Territory Environment Protection Authority
NTU	Nephelometric Turbidity Unit
PWC	Power and Water Corporation

Abbreviation	Definition
RL(s)	Reporting Limit(s)
RM	Rolling Median – of all years of available data; utilised in absence of adequate datasets.
SSTV	Site Specific Trigger Values
TN	Total nitrogen
TP	Total phosphorous
TSS	Total suspended solids
WDL(s)	Waste discharge licence(s)
WSP(s)	Waste stabilisation pond(s)
WwTP(s)	Wastewater Treatment Plant(s)

Executive Summary

This Annual Monitoring Report presents wastewater monitoring results for the 22 remote communities operating under Waste Discharge Licences (WDLs) between 1 July 2025 and 30 June 2026, together with trend data from 2022/23 to 2025/26. Monitoring indicates that most treatment systems remained stable or improved during the reporting period. Of the 22 licensed facilities, 20 were assessed as presenting a low environmental risk, while Yirrkala and Gunbalanya were assessed as presenting a moderate risk.

Notable improvements in treatment performance were recorded at several sites, including Wurrumiyanga, Numbulwar, Wadeye, Pirlangimpi, Warruwi, Ngukurr and Belyuen. Improvements included enhanced solids settling, reductions in organic loading and nutrients, improved oxygenation, and better bacteriological treatment outcomes. Most remaining facilities demonstrated generally stable performance, with observed variability consistent with seasonal and operational influences typical of passive waste stabilisation pond systems.

Belyuen recorded substantial treatment performance improvements, including reductions in bacteriological indicators, suspended solids, biochemical oxygen demand and nutrients, together with increased dissolved oxygen at the pond outlet. Water quality in Woods Inlet remained generally stable, and differences between pond outlet and receiving-environment monitoring results do not indicate discharge-related deterioration. Similarly, site visits at Gapuwiyak, Beswick, Barunga, Acacia Larrakia, Kalkarindji and Wurrumiyanga did not identify deleterious effects attributable to wastewater discharges (i.e. visual evidence relating to gross pollutants, algal blooms, mortality of fish etc.) in accessible receiving waterways. No such effects were reported during routine inspections at the other remote facilities.

Interpretation of results at Nauiyu and Minjilang was limited by reduced data availability, while remote access, weather, equipment, transport and laboratory constraints affected monitoring at other locations. Four Round 2 investigations were recorded during the reporting period, comprising missed sampling events at Barunga, Peppimenarti and Warruwi, and a discharge from a non-approved point caused by a broken pipe at Wurrumiyanga.

Overall, environmental risk associated with the remote wastewater facilities is considered low, with localised treatment-performance concerns requiring continued monitoring at selected sites. Routine monitoring, site inspections and investigation of adverse trends will continue to support the identification of emerging risks and prioritisation of operational improvements across the remote wastewater network.

Regulatory Requirements

Power and Water Corporation operates 57 Waste Stabilisation Ponds (WSPs) across the Northern Territory (NT). Under the Water Act 1992, discharging waste into water is prohibited unless specifically authorised through Waste Discharge Licences (WDLs) issued under Section 74 of the act. These licences permit Power and Water to discharge secondary treated sewage effluent into designated waterways.

Currently, Power and Water hold WDLs for 22 remote communities. The corporation is required to submit an Annual Monitoring Report for all remote WDLs, meeting specific conditions:

- Adherence to the Administrating Agency's 'Guideline for Reporting on Environmental Monitoring.'
- Inclusion of all required monitoring data.
- Long-term trend analysis of data over a period of three years.
- Assessment of environmental impact from the activity.
- Summary of Investigations for the preceding 12 months (Only a requirement under Round 2 WDLs (*Condition 39.5*)

This report presents initial findings from treated effluent monitoring in remote communities, providing a foundation for future environmental risk assessments.

Monitoring Report Requirements

Table 1. Monitoring report requirements

Provision
This Monitoring Report has been prepared in accordance with the NT EPA 'Guideline for Reporting on environmental Monitoring' (Version 1.0) where practicable and applicable.
A tabulated summary of all monitoring data for remote community WDLs is completed and provided as Appendix C – Tabulation of Monitoring Results – Treated Effluent.
Trend analysis and interpretation of the results is provided in Monitoring Results and Discussion section. Monitoring data included in this report covers the current monitoring year and 3 previous years of historical monitoring data.
An assessment of environmental impacts from the activity is included in Environmental Impacts Summary section. Further specific information is available in individual Environmental Risk Assessments for each community.
A summary of investigations undertaken at Round 2 sites has been included and non-compliances have been reported in individual Annual Returns.

Background and Objective

Program Overview

- Commencement and Scope: The program began in 2015 and now includes 22 remote facilities, complying with WDL (Waste Discharge Licence) requirements.

Wastewater Stabilisation Ponds (WSPs)

- Characteristics: WSPs are low input, cost-effective, and suitable for high-temperature environments with available land.
- Suitability: Ideal for remote communities due to low maintenance

Licensing and Risk Ranking

- Issued by DLPE: Licenses are based on discharge risk:
    - Round 1: 7 highest risk sites with higher discharge volumes.
    - Round 2: 9 medium risk sites with lower discharge volumes.
    - Round 3: 6 low risk sites with intermittent or seasonal discharge.

Monitoring and Compliance

- Frequency and Methods: Monitoring frequency is based on license conditions.
- External Monitoring: An external contractor monitors the Woods Inlet environment at Belyuen WSP during specific tidal conditions to capture near-worst-case scenarios.
- Logistics and Constraints: Monitoring may be affected by logistical and laboratory constraints.

Objectives and Data

- Objectives:
    - Ensure regulatory compliance.
    - Minimise environmental impact and public health risks.
    - Understand operational performance for maintenance and improvements.
- Data Coverage: Data from July 2022 to June 2026.
- Sample Collection: Samples are collected as specified, with discharge points outlined in WDLs.
- Samples are preserved and analysed by NATA-accredited laboratories.

Rainfall Data

- Regional Records: Rainfall data from Darwin, Katherine, Maningrida, and Wagait Beach stations were used as references.
- Some stations that were historically used for sources of data had to be retired due to BOM ceasing data measurements at those areas. Thus, some historical data has been changed to match the newly adopted station number.

Table 2. Annual Average Rainfall Data (BOM, 2026)

Region	Weather Station Number	Total annual rainfall per year (mm)				Annual Average
		2022/2023	2023/2024	2024/2025	2025/2026	All years
Darwin	14015	1984.8	1764.8	2028.4	2412.2	2047.4
Katherine	14902/14323	955.8	815.3	992.8	1643.6	1101.9
Maningrida	14405	1476	889.4	1244.8	1464.4	1268.65
Wagait	14238	1231.4	1830.9	1848.2	2421.8	1833.1

QA/QC Protocols and Data Limitations

The assessment and interpretation of water quality data employ QA/QC protocols to enhance the reliability and accuracy of the findings. These protocols incorporate the use of annual median values to mitigate the impact of outliers, ensuring a more representative analysis of environmental data. Outliers are flagged but retained within the dataset to uphold the integrity of the statistical method. Despite these measures, several challenges and inherent limitations persist that can affect the quality of data. The following points detail these challenges and describe the QA/QC processes involved:

1. **Climate Influence on Treatment Processes**:
    - The effectiveness of sewage treatment is highly sensitive to climatic factors such as temperature, precipitation, and evaporation. These directly impact the biological and chemical processes within the treatment facilities.
    - Extreme weather events, such as heavy rainfall or drought, can dramatically alter the concentration of pollutants and affect the efficacy of pollutant removal, complicating the interpretation of effluent quality.
2. **Data Completeness and Accuracy**:
    - Small sample sizes and infrequent monitoring pose significant challenges in capturing a comprehensive dataset that accurately represents water quality conditions over time.
    - Several investigations are being undertaken into the non-compliance with monitoring programs required under the conditions of our licences. Despite every effort being made to adhere to the monitoring program, issues with sampling delivery, laboratory analysis, and contamination events have affected the completeness of the data. Summaries of complete data have been included in Appendix A.
    - Despite adherence to standards by NATA accredited laboratories, limitations in sampling and analytical methods can impact data accuracy and completeness.
    - The pond associated with Acacia Larrakia sample site SAK090, is empty for the majority of the year. As such, SAK030 (the pond that feeds into SAK090) is used as an alternative sampling site to maintain sufficient monitoring.
3. **Logistical Challenges in Data Collection**:
    - Remote locations, adverse weather conditions, equipment malfunctions, and community unrest can delay or complicate data collection efforts. These logistical challenges can lead to gaps in data or deviations from the planned monitoring schedule. Timestamping for sample collection ensures data validity and traceability.
4. **Standardisation of Data Presentation**:
    - Data is typically presented as annual median values to align with ANZECC Guidelines and provide a consistent basis for evaluating long-term trends.
    - Outliers and data anomalies are assessed to ensure they do not skew the overall data interpretation, with thorough investigations conducted to ascertain their causes.

5. **Variability in Treatment Facility Design**:
    - Variations in the design and operation of wastewater stabilisation ponds, such as differences in size, depth, and inflow characteristics, can lead to significant discrepancies in treatment performance across sites.
6. **Instrument Complications:**
    - Historically, remote flow meters have been problematic as they are exposed to strenuous conditions and are frequent casualties to lightning strikes. As such, estimated flow data has previously been used. Recently, PWC has undertaken significant development to re-establish the flow meters and restore data measurement. Actions are now being undertaken to install temporary pervasive units to immediately restore data measurement and maintain the instruments as required. However, estimated flow volumes are being used until this action is complete.

These QA/QC protocols and the awareness of data limitations assist in a nuanced interpretation of the monitoring results. They help maintain the integrity of the environmental monitoring process and ensure that conclusions drawn from the data are robust and well-founded.

Monitoring Results and Discussion

The Remote WDL Monitoring Report, covering July 2022 to June 2026, presents analyte monitoring results grouped by discharge risk levels: Round 1, Round 2, Round 3, and Belyuen WSP. Key points include:

1. **Data Presentation**:
    - Results are presented over a 4-monitoring year range to allow comparisons and analysis.
2. **Analysis**:
    - Seasonal variations are considered in the interpretation of monitoring results.
    - This helps in understanding environmental conditions and the effectiveness of wastewater treatment and management practices.

This approach ensures a detailed and contextualised understanding of the monitoring data, emphasising the influence of seasonal and environmental factors on wastewater treatment performance.

Discharge Volumes

The report observes that relatively low discharge volumes from licensed remote community Wastewater Stabilisation Ponds (WSPs) align with the low equivalent populations (EP) or equivalent tenements at these sites. Key points include:

1. **Equivalent Population discharge flows**:
    - EP discharge flows refer to the estimated discharge based on the number of individuals, calculated from household size, water usage, wastewater generation rates, as well as factors such as evapotranspiration and sewage pond water volume capacity and area.
    - Remote communities typically have smaller populations compared to urban areas, resulting in lower EP or equivalent tenements.

Table 3.Estimated Average Daily Discharge KL/Day (Population data – BushTel 2026)

Community	Population (BushTel)	Average Daily Flow (kL/day)	Estimated Daily Flow (kL/day)
Nauiyu*	411	N/A	112.9
Wadeye*	2259	N/A	609.3
Milingimbi*	1288	N/A	419.4
Ramingining*	956	N/A	261.1
Yirrkala*	771	N/A	194.1
Galiwinku*	2582	N/A	823.8
Maningrida*	2956	N/A	815.4
Belyuen*	175	N/A	47
Barunga	396	89.8	N/A
Numbulwar	799	286.9	N/A
Warruwi*	507	N/A	157.4
Wurrumiyanga*	1668	N/A	516.4
Pirlangimpi*	372	N/A	119.8
Peppimenarti*	223	N/A	66.2
Milikapiti*	486	N/A	158.8
Gunbalanya*	1354	N/A	436.7
Acacia Larrakia*	35	N/A	0
Ngukurr*	1277	N/A	349.3
Gapuwiyak*	828	N/A	251.5
Kalkarindji*	450	N/A	118.2
Beswick*	636	N/A	156.5
Minjilang*	311	N/A	81.9

Nil discharge was estimated to have occurred at Acacia Larrakia during the reporting period due to low population and high evapotranspiration rates. Following site visits and re-evaluations of estimated flow, Kalkarindji daily flow has been reassessed as greater than zero, contrary to previous estimates.

2. **Design and Capacity**:
    - The design and capacity of WSPs in remote areas are tailored to accommodate the specific wastewater needs of the local population.
    - This tailoring contributes to the relatively low discharge volumes observed in these communities.
3. **Management and Operation**:
    - Wastewater treatment systems are managed and operated to meet local population needs while considering environmental impact and sustainability.
    - Aligning the capacity of treatment facilities with the equivalent population ensures effective treatment and minimises environmental impact.
4. **Measured and Estimated Flow Volume**:

    Flow Measurement Techniques:

    - **Direct Measurement:** Flow volumes are typically measured directly via instruments that record inflow and outflow at various points within the water system.

Estimation Methods:

- **EP/ET Discharge Volume Estimates:** For sites lacking reliable measured data (*), flow volumes are estimated based on Equivalent Population (EP) and Equivalent Tenement (ET) calculations. This method utilises established norms for:
    1. **Average Dry Weather Flow (ADWF):** Calculated for 320 days to represent non-peak conditions.
    2. **Peak Wet Weather Flow (PWWF):** Designated for 45 days to account for higher flow volumes during rainy periods.
- **Flow Factors by Region:**
    1. **Tropical Northern Region:** This area, located north of the Adelaide River, experiences an annual rainfall generally above 1500 mm. A wet flow factor of 6 is used here to accommodate the significant increase in water flow during the wet season.
    2. **Victoria/Daly and Roper/Gulf Regions:** Situated between Tennant Creek and Adelaide River, these regions receive annual rainfall between 500 mm and 1500 mm. A flow factor of 5 is applied.
    3. **Arid Region:** South of Tennant Creek, this region sees less than 500 mm of rainfall annually, leading to a lower wet flow factor of 4, reflecting the minimal impact of wet weather on flow volumes.

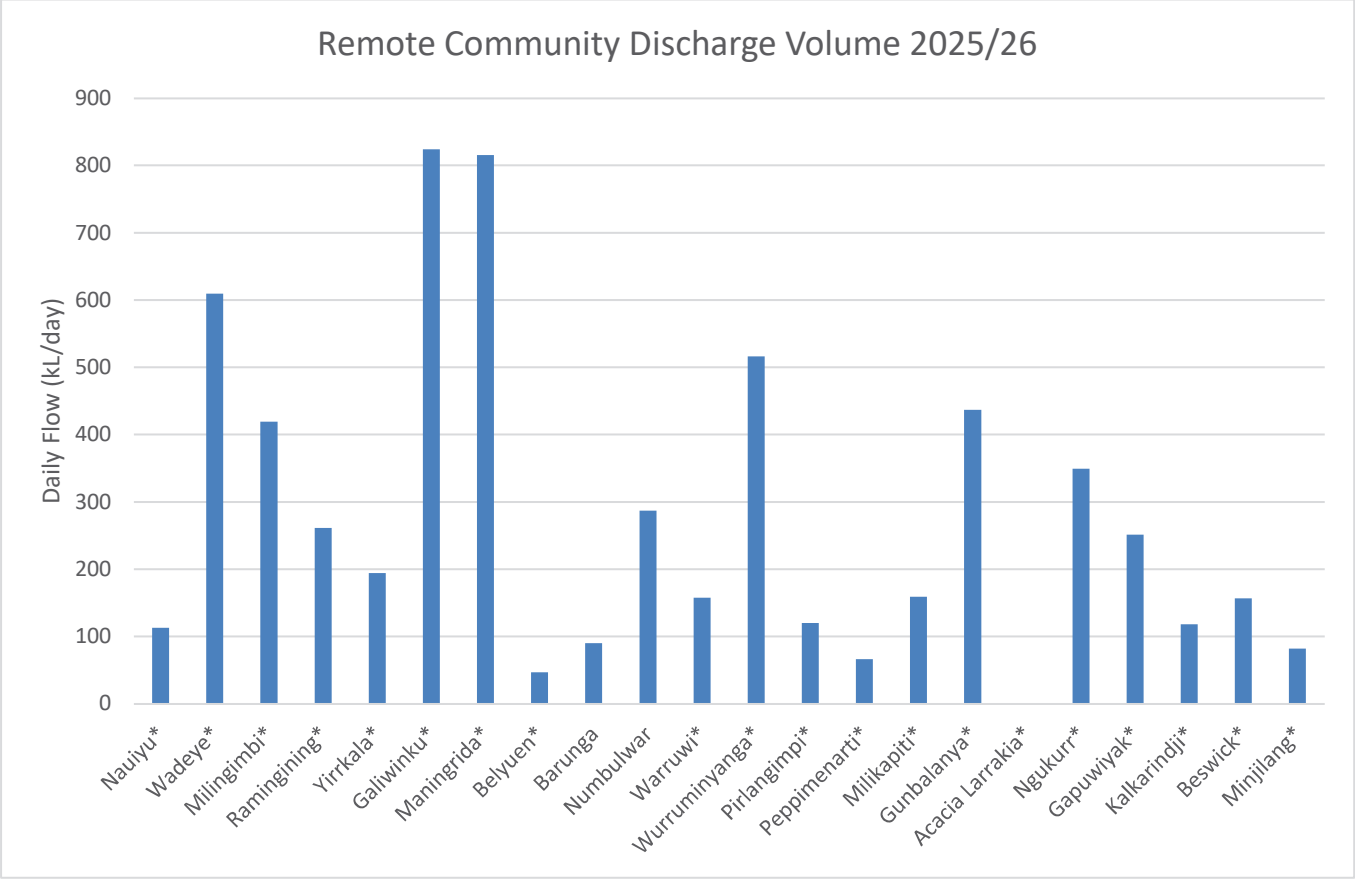

Figure 1. Remote Communities Average Daily Discharge Volume (- Estimated discharge volumes)*

Water Quality Data

The graphs in Appendix A illustrate various water quality parameters across multiple locations for the period from 2022 to 2026. The parameters include chlorophyll-a, *E. coli*, total suspended solids (TSS), filtered reactive phosphorus (FRP), total phosphorus (TP), biochemical oxygen demand (BOD), dissolved oxygen percentage (DO%), total nitrogen (TN), and turbidity.

E. coli

E. coli is a bacteriological indicator of faecal contamination and is used to assess wastewater treatment and pathogen reduction performance. Elevated concentrations may indicate reduced treatment efficiency, increased wastewater loading or insufficient retention time. Concentrations can be reduced through natural die-off, sunlight exposure, elevated pH, sedimentation and predation within waste stabilisation ponds.

Total Suspended Solids (TSS)

TSS measures the particles suspended in water. Elevated TSS can reduce light penetration, affecting photosynthesis and consequently, chlorophyll-a levels. Locations with elevated TSS might also see elevated BOD due to the decomposition of organic matter.

Chlorophyll-a

Chlorophyll-a levels are an indicator of algae and phytoplankton. Elevated levels usually correlate with increased nutrient inputs.

Filtered Reactive Phosphorus (FRP) and Total Phosphorus (TP)

Both FRP and TP indicate the presence of phosphorus in the water, a key nutrient that can promote algal growth. It is often the limiting nutrient in microbial proliferation meaning sudden elevated levels of phosphorus can cause proliferation events (commonly correlating with Chlorophyll-a).

Biochemical Oxygen Demand (BOD)

BOD measures the amount of oxygen required to decompose organic matter. Elevated BOD indicates significant organic presence. Elevated BOD can reduce dissolved oxygen (DO%) levels which can have significant effects on ecosystems.

Dissolved Oxygen Percent Saturation (DO%)

DO% indicates the oxygen available in water. Low DO% can result from elevated BOD, as decomposing organic matter consumes oxygen. Elevated chlorophyll-a levels can also lead to extreme DO% concentrations as algal species can both respire or photosynthesise depending on light concentration.

Total Nitrogen (TN)

TN measures nitrogen levels, another nutrient that promotes algal growth. Elevated TN can correlate with elevated chlorophyll-a levels and BOD, as more nutrients lead to more organic matter.

Turbidity

Turbidity measures the clarity of water. Elevated turbidity often correlates with elevated TSS and can affect photosynthesis, indirectly impacting chlorophyll-a levels. A high turbidity can also exist with low TSS if organic matter form colloidal suspensions within waterbodies.

Correlations

- **Nutrients and Chlorophyll-a:** Higher nutrient availability can promote algal growth and increase chlorophyll-a.
- **Chlorophyll-a, DO and pH:** Increased algal photosynthesis (indicated by high chlorophyll-a) consumes CO_2, increasing DO and pH.
- **Respiration, DO and pH:** Increased biological respiration consumes oxygen and produces CO_2, potentially decreasing DO and pH.
- **BOD and DO:** Higher BOD increases oxygen demand and can reduce DO.
- **Chlorophyll-a and BOD**: High algal biomass, indicated by high chlorophyll-a, can increase organic matter and contribute to elevated BOD.
- **Chlorophyll-a, TSS and Turbidity**: Suspended algae, indicated by high chlorophyll-a levels, can increase both TSS and turbidity.
- **TSS and Turbidity**: Increased suspended solids generally increase turbidity and reduce light penetration.
- **Turbidity and Algal Growth**: Non-algal turbidity can reduce light penetration and limit photosynthesis.
- **Ammonia, NOx and DO**: High ammonia with low DO and NOx is consistent with limited nitrification.
- **DO and Nitrification**: Improved oxygenation can promote conversion of ammonia to NOx.
- **Ammonia and Total Nitrogen**: Ammonia often comprises a substantial proportion of total nitrogen, causing similar trends.
- **pH and Ammonia**: Higher pH increases the proportion of ammonia present as more toxic un-ionised NH_3.
- **Algae and Nutrient Removal**: Algal growth can reduce dissolved nitrogen and phosphorus through biological uptake.
- **FRP, TP and Algae**: FRP supports algal growth, while algal biomass can contribute to particulate total phosphorus.
- **Solids, Turbidity and BOD**: Improved solids settling, commonly occurring in dry season, can reduce TSS, turbidity and particulate organic matter contributing to BOD.
- **Sunlight, TSS and Bacteria**: Lower TSS and turbidity improve sunlight penetration and can enhance bacterial inactivation.
- **pH and Bacterial Inactivation**: High pH associated with algal photosynthesis can enhance E. coli and enterococci inactivation.
- **Bacteriological Indicators and Nutrients**: Elevated bacteria and nutrients may occur together due to increased wastewater loading or reduced treatment efficiency.
- **Retention Time and Treatment**: Longer retention promotes settling and bacterial die-off; increased hydraulic loading can reduce treatment efficiency.

- **Pond outlet and Receiving-Environment Water Quality**: Changes in discharge quality at pond outlets may be reflected in the receiving environment, however, environmental impacts are only indicated where corresponding changes are observed in the receiving-environment.

Monitoring Results Discussion

Each observation for every round involves comparing results from locations within that specific round. It is important to note that all results are from the discharge point or the final pond before or near the outlet of the sewage ponds. Belyuen WSP is the only site where the receiving environment (Woods Inlet) is monitored; hence, the discussion of monitoring results is presented separately in this section.

Round 1 – Highest risk

(figure 2 - figure 16)

Galiwinku:

Overall treatment performance showed improvement this monitoring year, with substantial reductions in turbidity and BOD and a slight reduction in TSS, indicating reduced organic and suspended solids loading at the pond outlet. Chlorophyll-a increased, indicating greater algal productivity, while DO% remained low and ammonia remained elevated with persistently low NOx, indicating limited nitrification. Bacteriological parameters also improved, with reductions in both E. coli and enterococci. Overall, the improvements in organic loading, suspended solids and bacteriological parameters indicate improved treatment performance, while algal biomass and nitrogen treatment will continue to be monitored. Environmental risk is low.

Milingimbi:

Overall treatment performance showed improvement in several key parameters this monitoring year. Ammonia, total nitrogen and total phosphorus decreased, BOD reduced slightly, and enterococci decreased substantially from the exceptionally high 2024/25 median. Turbidity, TSS and chlorophyll-a increased, indicating greater suspended and algal material at the pond outlet, while persistently low DO and NOx indicate limited nitrification. E. coli increased slightly but remained broadly consistent with recent monitoring results. Overall, improved nutrient concentrations and the substantial reduction in enterococci are positive indicators, while suspended solids and oxygen conditions will continue to be monitored. Environmental risk is low.

Maningrida:

Overall treatment performance remained relatively stable this monitoring year, with further reductions in turbidity, TSS and BOD continuing the general improvement in solids and organic loading observed over recent monitoring periods. Chlorophyll-a also remained relatively stable. DO decreased and ammonia and total nitrogen increased, while persistently low NOx indicates limited nitrification. Bacteriological parameters increased compared with the particularly low 2024/25 results, although E. coli remained substantially below the higher concentration recorded in 2023/24. Overall, continued improvements in solids and organic matter treatment are evident, while nitrogen and bacteriological performance will continue to be monitored. Environmental risk is low.

Nauiyu:

Assessment of treatment performance this monitoring year is affected by temporal sampling bias, as the available results are based on only three sampling events rather than the usual twelve. Samples were missed due to the site being inaccessible because of flooding and evacuation of the community. The sampling events that occurred between September and November, during the build-up and first rainfall period when pond treatment can experience greater seasonal stress, meaning the annual medians may not be representative of full-year performance. TSS, turbidity, chlorophyll-a and bacteriological parameters increased, while BOD decreased substantially and ammonia and total nitrogen continued to decline from the elevated concentrations recorded in 2023/24. Given the limited and seasonally concentrated dataset, the apparent deterioration in some parameters should be interpreted cautiously. Parameters will continue to be monitored through the standard WDL monitoring program and treatment performance will be re-

evaluated in the next monitoring report. Environmental risk is low based on the limited available dataset.

Ramingining:

Overall treatment performance remained broadly consistent with historical conditions this monitoring year, noting that limited data availability in 2024/25 prevents direct year-on-year comparison for most parameters. Compared with earlier monitoring periods, turbidity and chlorophyll-a were lower, while ammonia and total nitrogen were intermediate between previously recorded concentrations. TSS and BOD remained elevated and DO was lower than in 2022/23 and 2023/24, while persistently low NOx indicates limited nitrification. Bacteriological performance showed a positive reduction in enterococci to the lowest median across the four-year period, while E. coli increased compared with 2024/25 but remained comparable to 2022/23. Overall, improvements in enterococci and algal loading are evident, while organic loading and oxygen conditions will continue to be monitored. Environmental risk is low.

Wadeye:

Overall treatment performance improved this monitoring year, with substantial reductions in turbidity, TSS and BOD indicating improved solids settling and reduced organic loading at the pond outlet. DO increased markedly to 60% saturation, while increased chlorophyll-a indicates greater algal productivity and may be contributing to improved daytime oxygenation. Ammonia and total nitrogen increased, and persistently low NOx indicates limited nitrification; however, enterococci decreased substantially and E. coli remained broadly within the range observed in previous monitoring periods. Overall, the strong improvements in solids, organic loading and oxygen conditions indicate improved treatment performance, while nitrogen and bacteriological parameters will continue to be monitored. Environmental risk is low.

Yirrkala:

Overall treatment performance was variable this monitoring year. BOD and chlorophyll-a decreased, indicating some improvement in organic and algal loading, while turbidity and TSS increased from the comparatively low 2024/25 results but remained below the higher concentrations recorded in 2023/24. DO remained low, while ammonia and total nitrogen increased only slightly from 2024/25, although persistently low NOx indicates limited nitrification. E. coli and enterococci increased compared with 2024/25, indicating reduced bacteriological treatment performance this monitoring year. Overall, some positive trends in BOD and chlorophyll-a were observed, while solids, nitrogen and bacteriological parameters warrant continued monitoring. Environmental risk is moderate.

Round 2

(figure 17 – figure 31)

Barunga:

Consistently supersaturated DO was observed at Barunga, which is generally associated with active algal photosynthesis. This is supported by the historical relationship between DO, chlorophyll-a and turbidity at the pond. The elevated pH is consistent with algal photosynthesis, which removes dissolved carbon dioxide and temporarily increases pH, particularly during daylight hours. Although higher pH can increase the proportion of toxic unionised ammonia, the low total ammonia concentrations observed indicate that the resulting environmental risk remains low. Results provide a strong indication of effective nutrient removal and bacteriological treatment. Although wet-season data is limited, dilution during the wet season would generally be expected to reduce wastewater concentrations. Overall, the available results indicate effective treatment performance. Environmental risk is low.

Peppimenarti:

Consistently supersaturated dissolved oxygen was observed at Peppimenarti, indicating substantial daytime photosynthetic activity. This interpretation is supported by the historical positive relationship between dissolved oxygen and turbidity at the pond, provided that the elevated turbidity is predominantly associated with algal biomass. The elevated pH is also consistent with algal activity and poses a low environmental risk in the context of the low ammonia concentrations observed. Results provide a strong indication of effective nutrient removal and bacteriological treatment. Overall, the available results indicate effective treatment performance. Environmental risk is low.

Wurrumiyanga:

Overall treatment performance improved during the monitoring year. Substantially lower bacteriological indicators, together with reductions in BOD, turbidity and TSS, indicate improved solids settling, reduced organic loading and more effective treatment. DO remained elevated relative to the 2022–2024 monitoring periods, suggesting sustained oxygen production through algal photosynthesis and reduced oxygen demand within the pond. Collectively, these results indicate that the treatment system is under less strain and operating more effectively. Environmental risk is considered low.

Numbulwar:

Overall treatment performance improved this monitoring year, with substantially lower bacteriological parameters and reductions in BOD, turbidity and TSS compared with 2024/25, indicating improved solids settling and reduced organic loading at the pond outlet. DO remained relatively stable and elevated compared with the low level recorded in 2022/23, while chlorophyll-a remained high, indicating continued algal productivity within the pond. Ammonia increased slightly but remained below the higher concentration recorded in 2022/23, while persistently low NOx indicates limited nitrification. Overall, the treatment system appears less strained and is showing evidence of improved performance. Environmental risk is low.

Gunbalanya:

Overall treatment performance showed improvement in several parameters this monitoring year. E. coli and ammonia decreased compared with 2024/25, while BOD remained stable and turbidity, TSS and chlorophyll-a increased only slightly. DO remained low and the combination of low DO, elevated ammonia and consistently low NOx indicates limited nitrification. Enterococci increased substantially and represents the principal treatment-performance concern for the monitoring year; however, this result should be assessed alongside ongoing monitoring to determine whether it represents a persistent trend. Overall, improvements in E. coli and ammonia are positive, while the elevated enterococci result warrants further investigation and continued monitoring. Environmental risk is moderate.

Pirlangimpi:

Overall treatment performance improved this monitoring year, with substantial reductions in BOD, turbidity, TSS and chlorophyll-a indicating improved solids settling and reduced organic and algal loading at the pond outlet. DO also increased from the low level recorded in 2024/25, while ammonia, total nitrogen and total phosphorus decreased to their lowest levels across the four-year period. Enterococci continued its gradual decline, although E. coli increased and warrants continued monitoring to determine whether the increase represents a persistent trend. Overall, the broad improvements across physicochemical, nutrient and E. coli parameters indicate improved treatment performance. Environmental risk is low.

Warruwi:

Overall treatment performance improved this monitoring year, with substantial reductions in BOD, turbidity, TSS and chlorophyll-a indicating improved solids settling and reduced organic and algal loading at the pond outlet. DO also increased from the low level recorded in 2024/25, while ammonia, total nitrogen and total phosphorus decreased to their lowest levels across the four-year period. E. coli continued its gradual decline, although enterococci increased and warrants continued monitoring to determine whether the increase represents a persistent trend. Overall, the broad improvements across physicochemical, nutrient and E. coli parameters indicate improved treatment performance. Environmental risk is low.

Milikapiti:

Overall treatment performance remained relatively stable this monitoring year. Turbidity and chlorophyll-a decreased and BOD remained stable, indicating steady organic loading, although TSS increased and may reflect greater suspended material at the pond outlet. DO remained low and ammonia and total nitrogen increased, while persistently low NOx indicates limited nitrification. E. coli increased compared with 2024/25, while enterococci remained stable. Overall, reductions in turbidity and algal biomass were positive, while nitrogen, suspended solids and bacteriological parameters will continue to be monitored through the standard monitoring program. Environmental risk is low.

Round 3

(figure 32 – figure 46)

Acacia Larrakia:

Overall treatment performance remained strong this monitoring year, with BOD decreasing to its lowest level across the four-year period and TSS also decreasing, indicating effective organic matter reduction and solids settling. DO remained high despite decreasing from previous years, while the elevated pH is consistent with active algal photosynthesis and favourable conditions for natural pathogen inactivation. Ammonia and total nitrogen increased but remained low relative to the other pond systems, while total phosphorus increased. Bacteriological parameters increased, although E. coli remained very low. Overall, the treatment system continues to demonstrate effective treatment performance, with phosphorus and enterococci to remain under routine monitoring. Environmental risk is low.

Beswick:

Overall treatment performance showed several positive indicators this monitoring year. DO increased substantially alongside increased chlorophyll-a, suggesting greater algal productivity and associated daytime oxygenation, while ammonia and total nitrogen decreased to their lowest levels across the four-year period. Turbidity, TSS and BOD increased, although the concurrent increase in chlorophyll-a indicates that algal biomass may be contributing to the higher suspended and organic material measured at the pond outlet. Bacteriological performance was mixed, with E. coli increasing compared with 2024/25 while enterococci decreased substantially to its lowest median across the monitoring period. Overall, strong nitrogen removal and improved enterococci concentrations indicate effective treatment in key areas, while solids and organic loading will continue to be monitored. Environmental risk is low.

Kalkarindji:

Overall treatment performance remained biologically active this monitoring year. Turbidity, TSS and BOD increased alongside a substantial increase in chlorophyll-a, indicating that high algal biomass is likely contributing significantly to the suspended and organic material measured at the pond outlet. DO remained relatively high, while the increase in NOx indicates that some nitrification is occurring despite increases in ammonia and total nitrogen. Bacteriological parameters remained stable compared with 2024/25 and substantially below the elevated concentrations recorded in 2023/24. Overall, stable bacteriological performance and evidence of active biological treatment are positive, while increased algal biomass and associated solids and organic loading warrant continued monitoring. Environmental risk is low.

Minjilang:

Assessment of overall treatment performance this monitoring year is limited by the absence of physicochemical and nutrient data. This has been caused by crocodile presence within the ponds rendering sampling unsafe for staff. Crocodile removal has proven to be unsuccessful to date. Based on the available bacteriological results, E. coli increased while enterococci decreased compared with 2024/25 and continued to decline from the elevated concentration recorded in 2023/24. In the absence of supporting physicochemical data, it is not possible to determine whether the change in E. coli reflects a broader change in pond treatment conditions or an isolated bacteriological trend. Overall treatment performance cannot be fully assessed due to the current data gaps, and continued monitoring is required to establish a representative trend. Environmental risk is low based on the limited available dataset.

Ngukurr:

Overall treatment performance remained strong this monitoring year, with turbidity decreasing substantially, BOD remaining low and DO increasing to its highest level across the four-year period. Ammonia, total nitrogen and total phosphorus also decreased markedly, indicating improved nutrient treatment, while increased chlorophyll-a suggests greater algal productivity and may partly explain the improved DO. E. coli remained relatively low despite increasing from 2024/25, however enterococci increased slightly above stable readings. Overall, the treatment system continues to demonstrate effective physicochemical and nutrient treatment performance. Environmental risk is low.

Gapuwiyak:

Overall treatment performance showed improvement in several important areas this monitoring year. DO increased alongside increased chlorophyll-a, suggesting greater algal productivity and associated daytime oxygenation, while ammonia, total nitrogen and total phosphorus decreased substantially. Bacteriological performance also improved, with enterococci decreasing substantially and E. coli remaining relatively stable. Turbidity, TSS and BOD increased, although the concurrent increase in chlorophyll-a indicates that greater algal biomass may be contributing to the increased suspended and organic material measured at the pond outlet. Overall, improved nutrient concentrations, oxygenation and bacteriological performance are positive indicators, while solids and organic loading will continue to be monitored. Environmental risk is low.

Belyuen WSP Summary of Water Quality Monitoring Data

This section presents an analysis of water quality parameters at two monitoring sites: SBLEP01 – Belyuen Outfall, Woods Inlet, representing the receiving environment, and SBL090 – Belyuen Pond 2 Outlet/Discharge Point, representing treated wastewater at the final pond outlet. The analysis covers the 2022/23 to 2025/26 monitoring periods and considers temporal trends at each site, as well as whether changes observed at the wastewater treatment pond outlet are reflected in the receiving environment. The findings are summarised below:

Chlorophyll-a (figure 23)

- **SBLEP01:** Chlorophyll-a concentrations remained consistently very low across all monitoring periods, ranging from 0.65 to 4.00 µg/L. The 2025/26 median of 1.50 µg/L represents only a minor increase from 1.00 µg/L in 2024/25 and remains substantially below concentrations recorded at the pond outlet. There is no evidence of increasing algal biomass in the receiving environment associated with the discharge.
- **SBL090:** Chlorophyll-a concentrations remained elevated within the treatment pond, as expected for a waste stabilisation pond system where algal activity contributes to biological treatment and oxygen production. Concentrations have remained relatively stable and show an overall reduction from 121–130 µg/L in 2022/23 and 2023/24 to 106 µg/L in 2025/26. The absence of a corresponding increase at SBLEP01 indicates that elevated algal biomass within the treatment pond is not being reflected in the receiving environment.

E. coli (figure 18)

- **SBLEP01:** E. coli concentrations remained relatively low and stable across the four-year monitoring period, ranging from 135 to 232 MPN/100 mL. The 2025/26 median increased slightly from 135 to 184.5 MPN/100 mL but remained within the historical range and substantially below concentrations recorded at the pond outlet.
- **SBL090:** E. coli concentrations decreased substantially from 7,701 MPN/100 mL in 2024/25 to 2,295 MPN/100 mL in 2025/26, representing the lowest median across the four-year monitoring period. This indicates improved bacteriological treatment performance during the current monitoring year. The substantial difference between SBL090 and SBLEP01, together with the relatively stable receiving-environment concentrations, indicates limited evidence of a corresponding bacteriological impact at Woods Inlet.

Enterococci (figure 19)

- **SBLEP01**: Enterococci concentrations remained low, although a gradual increase was observed from 15 MPN/100 mL in 2022/23 to 68.5 MPN/100 mL in 2025/26. Despite this increase, concentrations remain below the concentration observed at the pond outlet.
- **SBL090**: Enterococci decreased substantially from 3,860 MPN/100 mL in 2024/25 to 100 MPN/100 mL in 2025/26 representing an improvement in bacteriological treatment performance.

Total Suspended Solids (TSS) (figure 25)

- **SBLEP01:** TSS remained relatively low across all monitoring periods. The median increased from 9.5 mg/L in 2024/25 to 19 mg/L in 2025/26; however, this remains within a relatively low range, and the increase did not correspond with an increase at the treatment pond outlet.

- **SBL090:** TSS decreased substantially from 37.5 mg/L in 2024/25 to 13 mg/L in 2025/26, representing the lowest median across the four-year monitoring period. This indicates improved solids settling and retention within the treatment system. The contrasting trends between the two sites, with TSS decreasing at SBL090 while increasing at SBLEP01, suggest that the receiving-environment increase is unlikely to be directly attributable to wastewater discharge and may reflect natural variability or other local sources of suspended material.

pH (figure 17)

- **SBLEP01:** pH decreased slightly from 7.36 in 2024/25 to 7.02 in 2025/26 and remained close to neutral. Conditions at Woods Inlet have remained relatively stable across the monitoring period, with pH ranging from 6.44 to 7.72.
- **SBL090:** pH decreased from 7.16 in 2024/25 to 6.21 in 2025/26, representing a shift towards more acidic conditions at the pond outlet. This change was not reflected at SBLEP01, where pH remained close to neutral at 7.02. The lack of a corresponding receiving-environment response indicates that the pond outlet pH has had minimal observable influence on pH conditions at Woods Inlet. The decrease at SBL090 should continue to be monitored to determine whether it represents a persistent change in pond conditions.

Biochemical Oxygen Demand (DO%) (figure 24)

- **SBLEP01:** BOD remained consistently low and stable at 1.0 mg/L across all four monitoring periods. This provides a strong indication that organic loading in the receiving environment has remained stable and that changes in BOD at the wastewater treatment pond outlet have not resulted in a measurable increase in the receiving environment.
- **SBL090:** BOD decreased substantially from 21.5 mg/L in 2024/25 to 5.5 mg/L in 2025/26, representing the lowest median across the four-year monitoring period. This indicates improved organic matter treatment and reduced oxygen demand in the treated wastewater. The combination of improved BOD at SBL090 and consistently low BOD at SBLEP01 indicates effective management of organic loading and minimal observable influence on the receiving environment.

Dissolved Oxygen (DO%) (figure 21)

- **SBLEP01:** DO remained stable across the four-year monitoring period, ranging from 59.5% to 62.7% saturation. The 2025/26 median of 61.6% is consistent with historical conditions and indicates no observable deterioration in receiving environment oxygenation.
- **SBL090:** DO increased substantially from 22% saturation in 2024/25 to 54.65% in 2025/26, indicating improved oxygen conditions within the final treatment pond. Stable DO at SBLEP01 indicates that variations in pond oxygen conditions have not adversely affected oxygenation in the receiving environment.

Ammonia (NH3-N) (figure 28)

- **SBLEP01:** Ammonia remained consistently very low across all monitoring periods, decreasing from 0.05 mg/L in 2022/23 to 0.01 mg/L from 2023/24 onwards. These results indicate negligible ammonia loading in the receiving environment and no observable increase associated with wastewater discharge.

- **SBL090:** Ammonia decreased substantially from 2.57 mg/L in 2024/25 to 0.96 mg/L in 2025/26, representing the lowest median across the four-year monitoring period. This indicates improved nitrogen treatment and reduced ammonia concentrations at the pond outlet. The very low and stable concentrations at SBLEP01 demonstrate that the higher ammonia concentrations historically present within the treatment pond have not translated into measurable ammonia enrichment at Woods Inlet.

Oxidised Nitrogen (NOx) (figure 26)

- **SBLEP01**: NOx remained consistently very low at 0.01 mg/L throughout the four-year monitoring period, indicating stable conditions and negligible oxidised nitrogen enrichment in the receiving environment.
- **SBL090**: NOx concentrations remained low throughout the monitoring period. The median increased from 0.008 mg/L in 2024/25 to 0.096 mg/L in 2025/26. The increase remains small in absolute terms and, together with the substantial reduction in ammonia, may indicate some improvement in nitrogen transformation within the treatment system. No corresponding increase was observed at SBLEP01.

Total Nitrogen (TN) (figure 27)

- **SBLEP01:** Total nitrogen remained consistently very low and decreased progressively from 0.06 mg/L in 2022/23 to 0.01 mg/L in 2025/26. This indicates no evidence of nitrogen enrichment in the receiving environment over the monitoring period.
- **SBL090:** Total nitrogen decreased substantially from 2.57 mg/L in 2024/25 to 1.19 mg/L in 2025/26 and is substantially below the 4.38 mg/L median recorded in 2023/24. The reduction in total nitrogen, together with the decrease in ammonia, indicates improved nitrogen treatment performance. The consistently very low concentrations at SBLEP01 indicate minimal observable influence on nitrogen concentrations in the receiving environment.

Filterable Reactive Phosphorus (FRP) (figure 30)

- **SBLEP01:** FRP concentrations remained negligible across the monitoring period, indicating no evidence of reactive phosphorus enrichment in the receiving environment.
- **SBL090:** FRP concentrations at the final pond outlet were consistently higher than at SBLEP01. The annual median peaked at 0.5500 mg/L in 2023/24 before declining to 0.1345 mg/L in 2024/25 and 0.0770 mg/L in 2025/26. Despite FRP remaining present at the outlet, the consistently low concentrations at SBLEP01 indicate minimal observable influence on the receiving environment.

Total Phosphorus (TP) (figure 29)

- **SBLEP01:** FRP concentrations remained very low throughout the monitoring period, with annual medians of 0.005, 0.002, 0.001 and 0.004 mg/L from 2022/23 to 2025/26, respectively. This indicates no evidence of sustained reactive phosphorus enrichment in the receiving environment.
- **SBL090:** Total phosphorus decreased substantially from 1.00 mg/L in 2024/25 to 0.31 mg/L in 2025/26, representing the lowest median across the four-year monitoring period. This indicates improved phosphorus reduction within the treatment system. The absence of any corresponding phosphorous increase at SBLEP01 indicates minimal observable influence of the pond discharge on concentrations in the receiving environment.

Turbidity (figure 20)

- **SBLEP01**: Turbidity remained low across the monitoring period. The median increased slightly from 7.41 NTU in 2024/25 to 10.70 NTU in 2025/26 but remained comparable to the 10.50 NTU recorded in 2022/23 and substantially below concentrations observed at the treatment pond outlet.
- **SBL090**: Turbidity decreased substantially from 80.5 NTU in 2024/25 to 13.25 NTU in 2025/26, representing the lowest median across the four-year monitoring period. This reduction, together with the decrease in TSS, indicates improved solids settling and reduced suspended material at the pond outlet. The slight increase at SBLEP01 occurred despite the substantial decrease at SBL090, suggesting that the receiving environment variation is unlikely to be directly driven by the wastewater discharge.

Overall Conclusion

Overall treatment performance at the Belyuen WSP improved substantially during the 2025/26 monitoring period. At SBL090, E. coli, enterococci, TSS, BOD, chlorophyll-a, ammonia, total nitrogen and total phosphorus all decreased compared with 2024/25, while DO% increased substantially. These changes collectively indicate improved bacteriological treatment, organic matter reduction, solids settling, nutrient reduction and pond oxygenation. The principal parameter requiring continued monitoring is pH, which decreased to 6.24 at SBL090; however, this change was not reflected at the receiving-environment monitoring location.

Water quality at SBLEP01 remained generally stable, with consistently low BOD, chlorophyll-a, ammonia, NOx, total nitrogen and total phosphorus. Although minor increases occurred in E. coli, enterococci, TSS and turbidity, these changes did not correspond with the substantial improvements observed at SBL090 and therefore do not indicate a clear discharge-related response. The consistently large difference in nutrient, organic and algal parameters between the pond outlet and Woods Inlet, together with the absence of corresponding temporal trends between the two sites, indicates limited observable influence from the wastewater discharge on receiving environment water quality. Considering the above, the overall environmental risk of the operation of Belyuen WSP has been assessed as low.

Environmental Impacts Summary

Environmental Risk Assessments (ERAs) evaluate and manage potential environmental risks associated with wastewater discharges from remote community wastewater treatment facilities. These assessments consider wastewater characteristics, treatment performance, discharge conditions, and the sensitivity of the receiving environment. Potential risks include the presence of pollutants and excessive nutrient loads; however, elevated concentrations within wastewater treatment ponds or at final pond outlets do not, in isolation, demonstrate an environmental impact. Environmental risk is therefore considered in the context of treatment performance, discharge characteristics, receiving environment monitoring and available site observations.

Overall, monitoring during the 2025/26 reporting period indicates that most remote wastewater treatment systems are operating effectively, with many facilities showing stable or improved performance compared with previous monitoring periods. Improvements were observed across a few sites through reductions in biochemical oxygen demand (BOD), turbidity, total suspended solids (TSS), nutrients and/or bacteriological indicators. Several treatment systems also recorded improved dissolved oxygen conditions, indicating reduced treatment strain or increased biological activity.

Strong or improving treatment performance was evident at several facilities. Wurrumiyanga and Numbulwar recorded substantial reductions in bacteriological indicators, BOD, turbidity and TSS, indicating improved treatment and solids settling. Wadeye also showed substantial reductions in BOD, turbidity and TSS together with improved dissolved oxygen conditions. Acacia Larrakia continued to demonstrate strong overall treatment performance, with low BOD, effective solids settling, high dissolved oxygen and very low E. coli concentrations. Ngukurr maintained low BOD and turbidity and recorded substantial reductions in ammonia, total nitrogen and total phosphorus, together with increased dissolved oxygen. Pirlangimpi also showed broad improvements in BOD, turbidity, TSS, chlorophyll-a, ammonia and total nitrogen.

Positive trends were observed across several sites. Galiwinku recorded reductions in turbidity, BOD and bacteriological indicators, while Gapuwiyak showed substantial improvements in nutrient and enterococci concentrations despite increased suspended and organic material. Warruwi recorded broad improvements in BOD, turbidity, TSS, chlorophyll-a and nutrients, together with a continued reduction in E. coli. Milingimbi showed improved nutrient concentrations and a substantial reduction in enterococci, while Maningrida continued to show improvements in solids and organic matter concentrations. At Ramingining, interpretation was affected by historical data gaps; however, enterococci decreased to the lowest median across the four-year monitoring period, and algal loading was lower than in earlier monitoring periods.

Some facilities showed mixed treatment trends requiring continued monitoring rather than evidence of a confirmed environmental impact. Milikapiti recorded increased ammonia, total nitrogen, TSS, and E. coli, although turbidity and chlorophyll-a decreased and BOD remained stable. Beswick recorded increased turbidity, TSS, and BOD; however, this occurred alongside increased chlorophyll-a and substantially improved dissolved oxygen, while ammonia, total nitrogen and enterococci decreased to their lowest levels across the four-year monitoring period. Kalkarindji recorded increased algal biomass, TSS and BOD, although dissolved oxygen remained relatively high, some nitrification was evident and bacteriological concentrations remained substantially below the elevated levels recorded in 2023/24.

Bacteriological variability was observed at several wastewater treatment pond outlets. Elevated or increasing E. coli and/or enterococci concentrations were recorded at some facilities, including Gunbalanya, Yirrkala, Nauiyu, Milikapiti, Maningrida and Ngukurr. These results indicate variability in pathogen reduction performance and will continue to be monitored.

At Nauiyu, the 2025/26 assessment was based on three available sampling events, which indicated elevated bacteriological concentrations. These results should be interpreted alongside future monitoring data to establish whether they represent a sustained trend. Similarly, assessment of Minjilang was limited to the available bacteriological results because physicochemical and nutrient data were unavailable, preventing a complete assessment of treatment performance.

Yirrkala and Gunbalanya showed treatment performance concerns during the reporting period. Yirrkala recorded increases in TSS, turbidity and bacteriological indicators, while dissolved oxygen remained low and nitrogen treatment remained limited. Gunbalanya recorded a substantial increase in enterococci together with persistently low dissolved oxygen and limited nitrification, despite improvements in E. coli and ammonia. These sites will continue to be monitored to determine whether the observed results represent persistent treatment trends and whether any additional operational investigation or management response is required. The available wastewater treatment data alone, however, does not demonstrate that deleterious effects have occurred in the receiving environment.

Belyuen provides receiving environment monitoring data from SBLEP01 at Woods Inlet, located near the wastewater discharge point. Treatment performance at the Belyuen WSP improved substantially during

2025/26, with reductions in E. coli, enterococci, TSS, BOD, chlorophyll-a, ammonia, total nitrogen and total phosphorus at SBL090, together with improved dissolved oxygen. Water quality at SBLEP01 remained generally stable, with consistently low BOD, chlorophyll-a, ammonia, oxidised nitrogen, total nitrogen and total phosphorus. Differences in temporal trends between SBL090 and SBLEP01 indicate that variations within the treatment system were not consistently reflected in the nearby receiving environment. The monitoring results therefore provide no clear evidence of deterioration in receiving environment water quality associated with the wastewater discharge during the reporting period.

Site visits were conducted by the Assurance team during the reporting period at Gapuwiyak, Beswick (Wugularr), Barunga, Acacia Larrakia, Kalkarindji and Wurrumiyanga. Visual observations of accessible receiving waterways did not identify deleterious effects attributable to wastewater discharges. Improvements to treatment performance were identified as being required at Gapuwiyak, although no deleterious effects were observed in the receiving waterway. Further to this, Utility Support Contract Workers (USCWs) did not report deleterious effects in accessible receiving waterways during routine site inspections at other remote wastewater treatment facilities during the reporting period.

Overall, the monitoring results indicate variable treatment performance across the remote wastewater treatment facilities, as expected for passive waste stabilisation pond systems subject to seasonal, climatic and operational variability. While individual treatment parameters and bacteriological indicators were elevated at some sites, improvements were observed across many facilities and there is currently no reported evidence of significant deleterious effects in receiving environments associated with wastewater discharges. Available receiving environment monitoring at Belyuen similarly indicates minimal observable influence on local water quality. Continued routine monitoring, targeted investigation of persistent adverse trends and ongoing site inspections will provide the basis for identifying emerging risks and prioritising operational improvements where required.

Overall environmental risk associated with the monitored remote wastewater treatment facilities is considered low, with localised treatment-performance concerns requiring continued monitoring at selected sites.

Summary of Investigations

Condition 39.5 of the Round 2 WDLs requires reporting on investigations undertaken by the licensee. During the 2025/26 monitoring period, a number of investigations were conducted in response to specific monitoring, operational or compliance matters. A summary of these investigations and the reasons for undertaking them is provided below.

- Barunga WDL214-03, INC-2697 – Missed samples causing non-compliance
- Peppimenarti WDL220-03, INC-2695 – Missed samples causing non-compliance
- Warruwi WDL222-03, INC-2693 – Missed samples causing non-compliance
- Wurrumiyanga WDL223-04, INC-1847 – Discharge from non-approved discharge point causing non-compliance
- Wurrumiyanga WDL223-04, INC-2616 – Discharge from non-approved discharge point causing non-compliance
- Belyuen, Gunbalanya, Milikapiti, Peppimenarti, Pirlangimpi, Warrurwi, Wurrumiyanga, multiple licences, INC-2684 – Non-functional Flow meters

Declaration of Accuracy

I, ***Tahlia Kemp*** (Manager Assurance, Performance Reporting & Improvement Water Services, Power and Water Corporation), have reviewed this report and I confirm that to the best of my knowledge and ability, all the information provided in the report is true and accurate.

Signature: 

Date: 31/07/2026

References

ANZECC and ARMCANZ (2000) Australian and New Zealand guidelines for fresh and marine water quality. National Water Quality Management Strategy. Australian and New Zealand Environment and Conservation Council and Agriculture Resource Management Council of Australia and New Zealand, Chapters 1 and 2.

BOM (2026) Bureau of Meteorology. Climate Data Online. Australian Government. Accessed 17 June 2025. http://www.bom.gov.au/climate/data/

Northern Territory Government 2026, *BushTel – Remote Communities of the NT*, viewed 30 July 2026, https://bushtel.nt.gov.au/search.

Appendix A - Monitoring Results Graph

Round 1

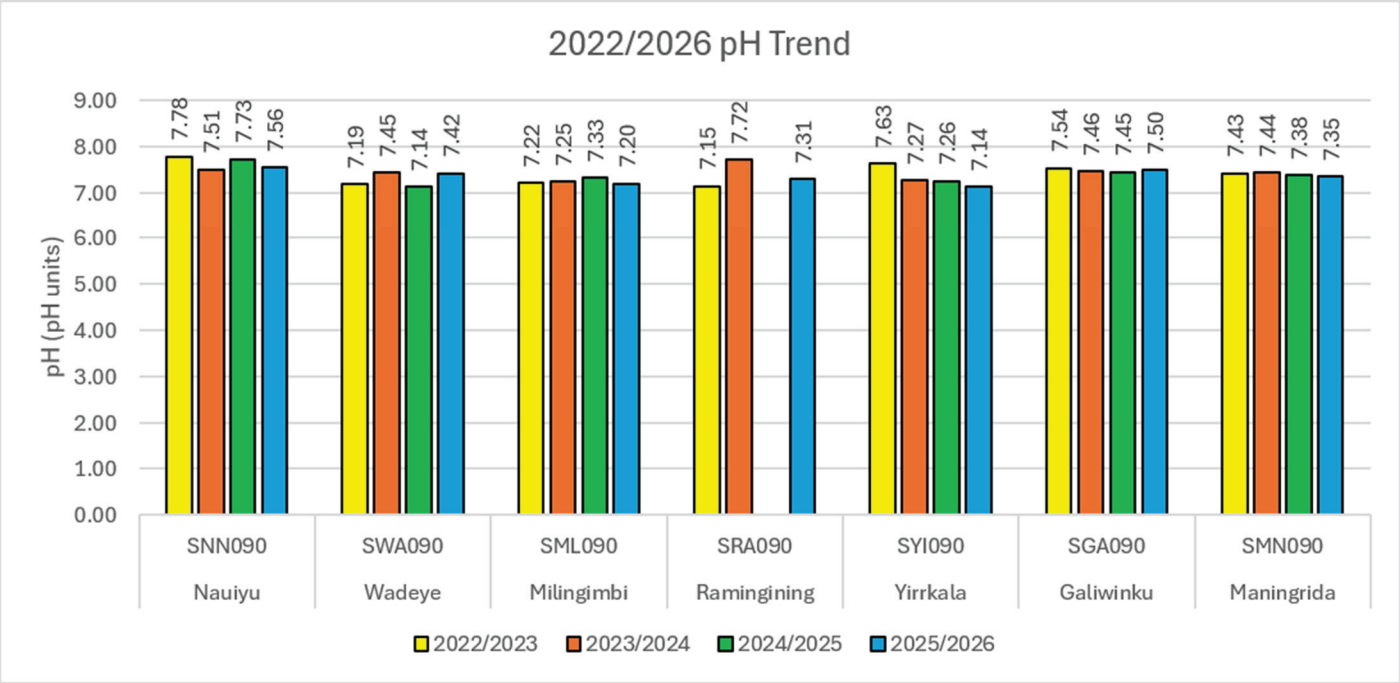

Figure 2. Round 1 pH Trend

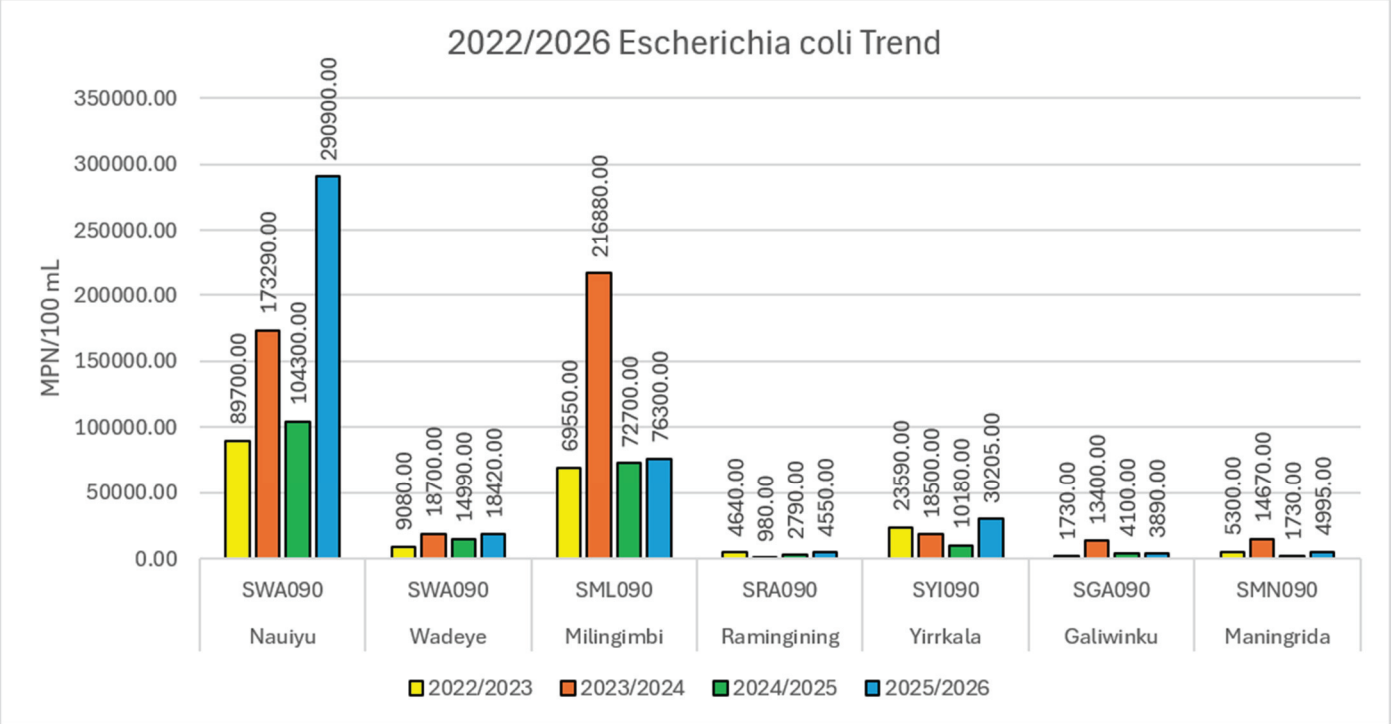

Figure 3. Round 1 E. coli Trend

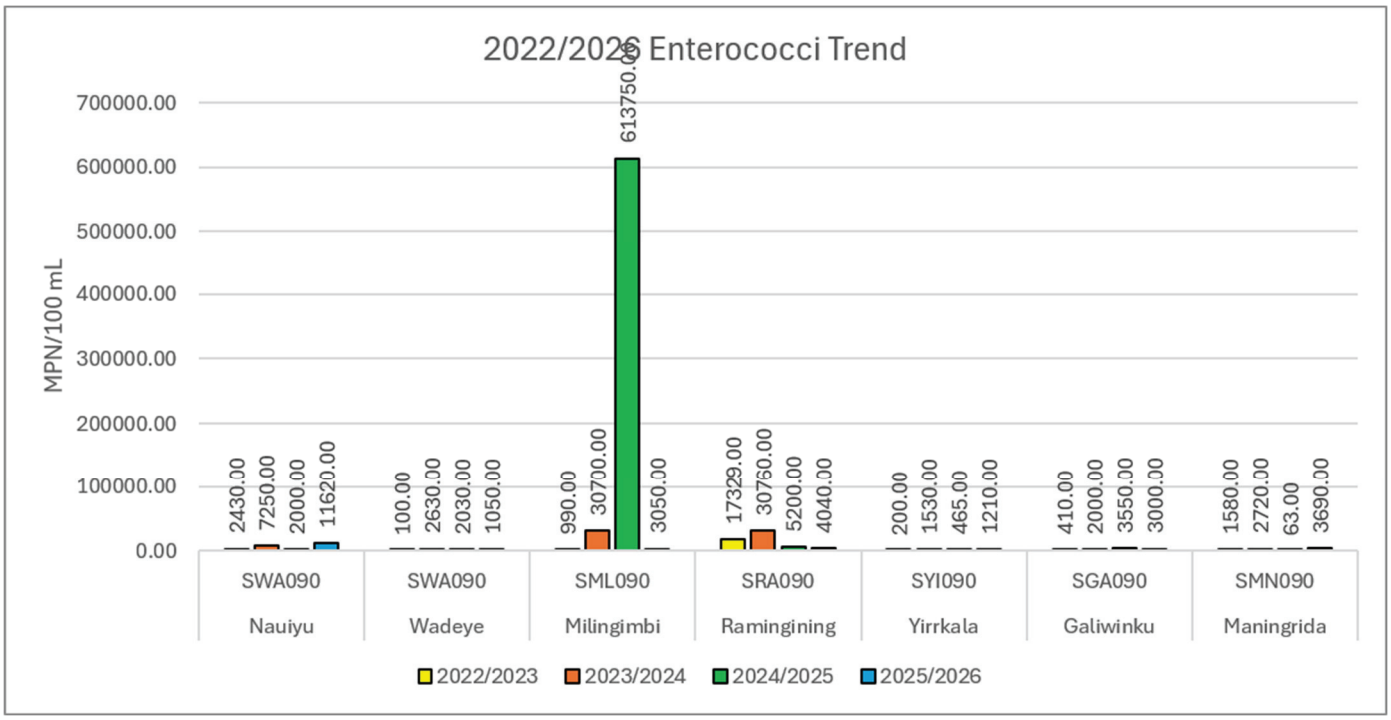

Figure 4. Round 1 Enterococci Trend

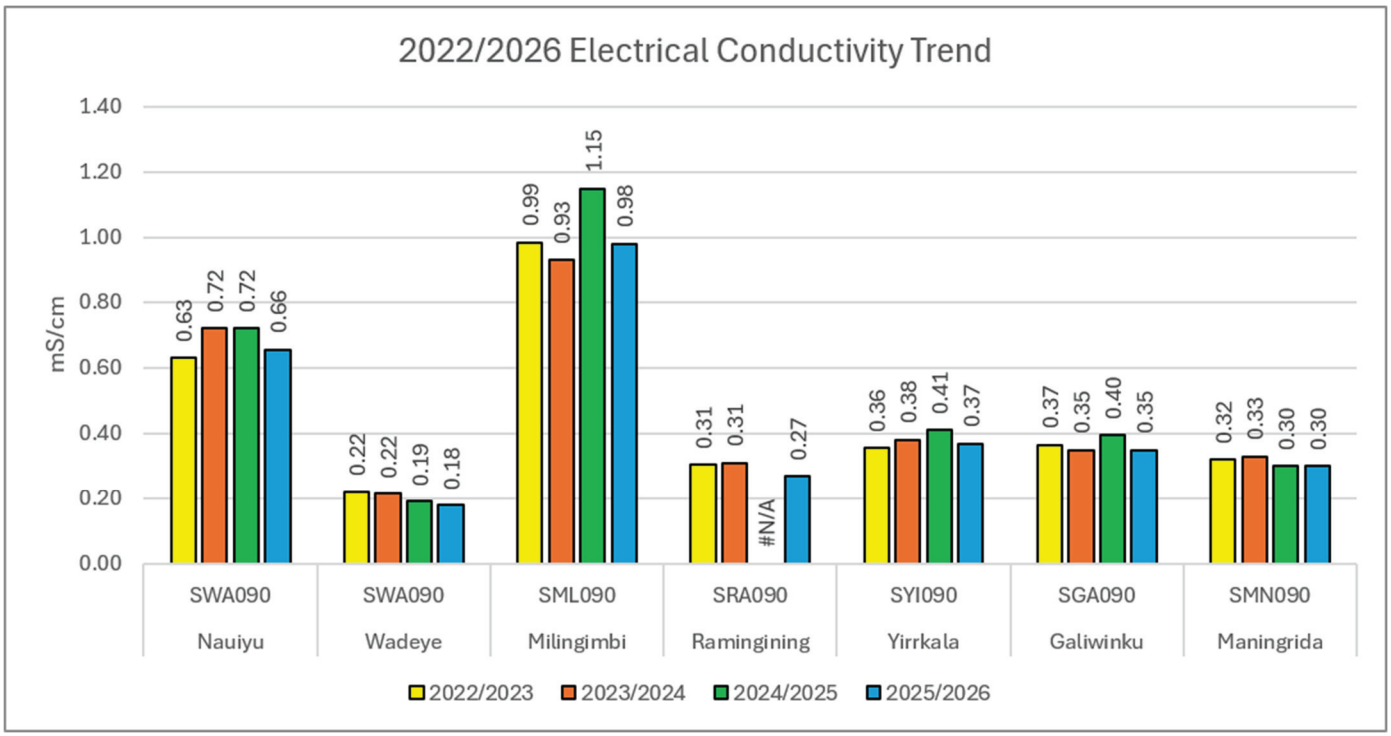

Figure 5. Round 1 Electrical Conductivity Trend

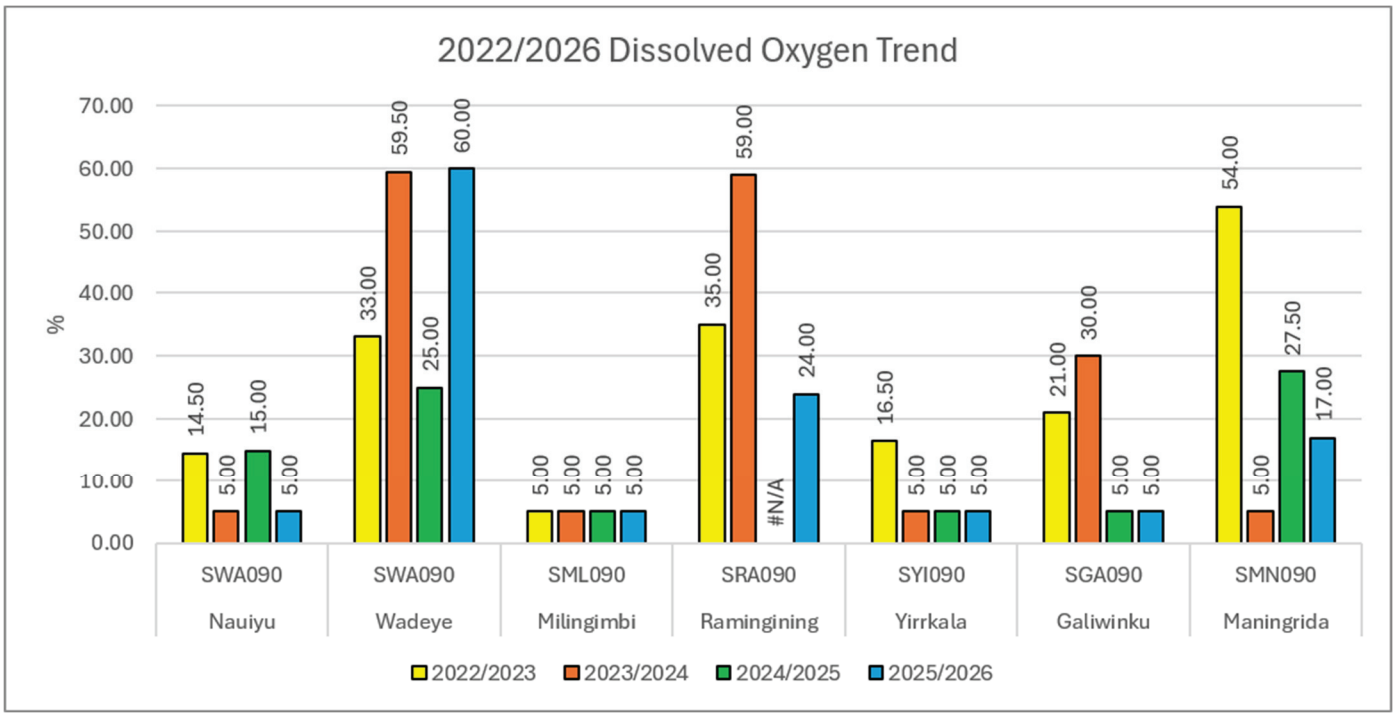

Figure 6. Round 1 Dissolved Oxygen Trend

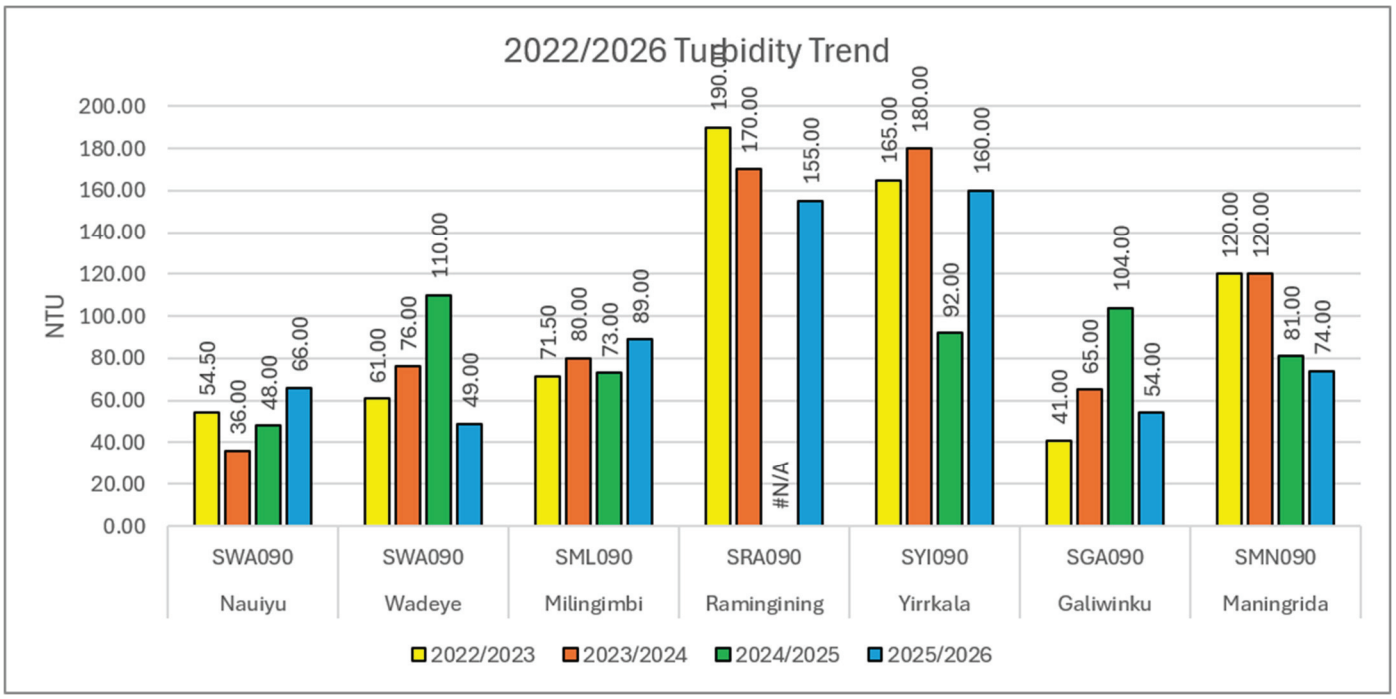

Figure 7. Round 1 Turbidity Trend

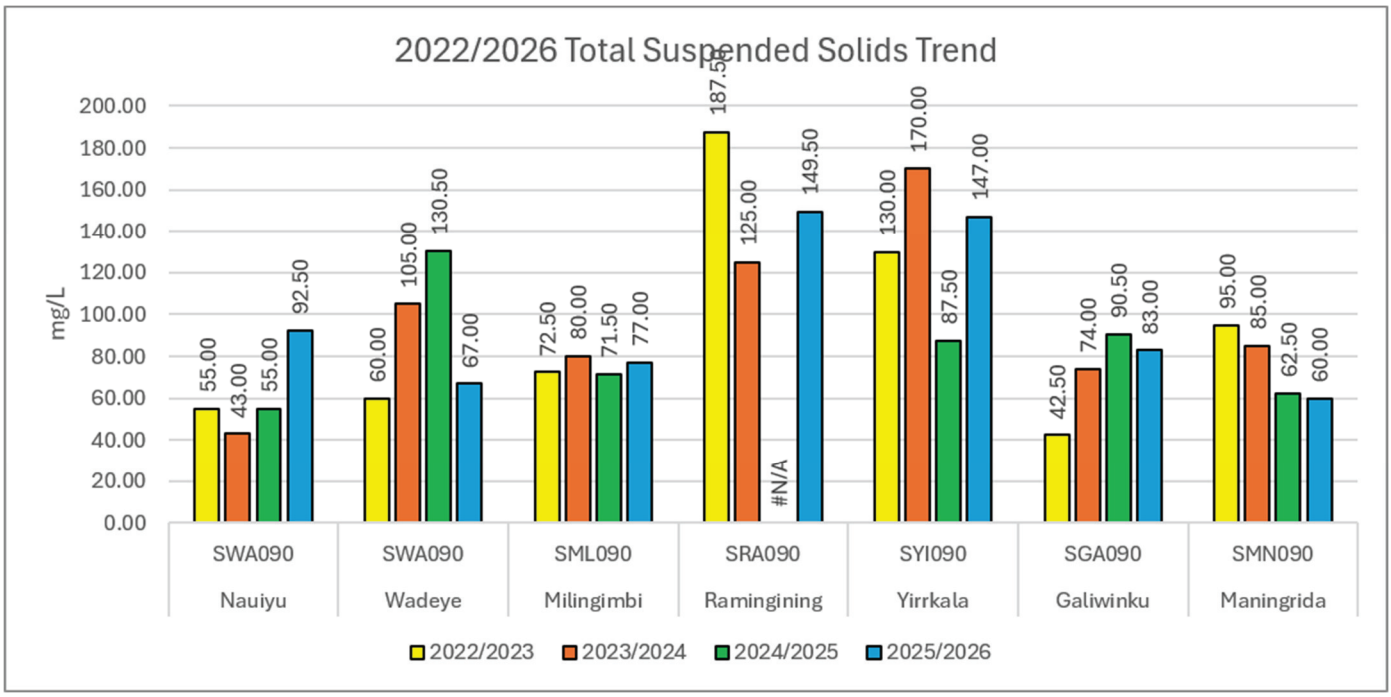

Figure 8. Round 1 Total Suspended Solids Trend

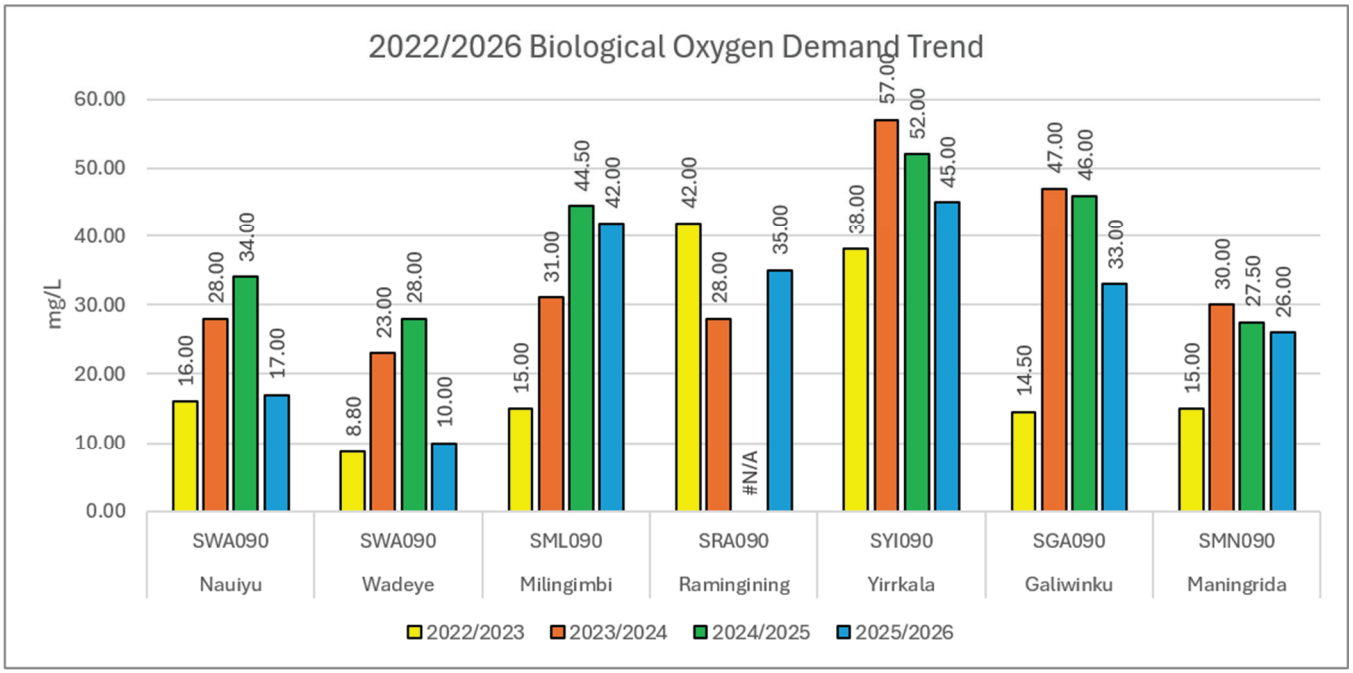

Figure 9. Round 1 Biological Oxygen Demand Trend

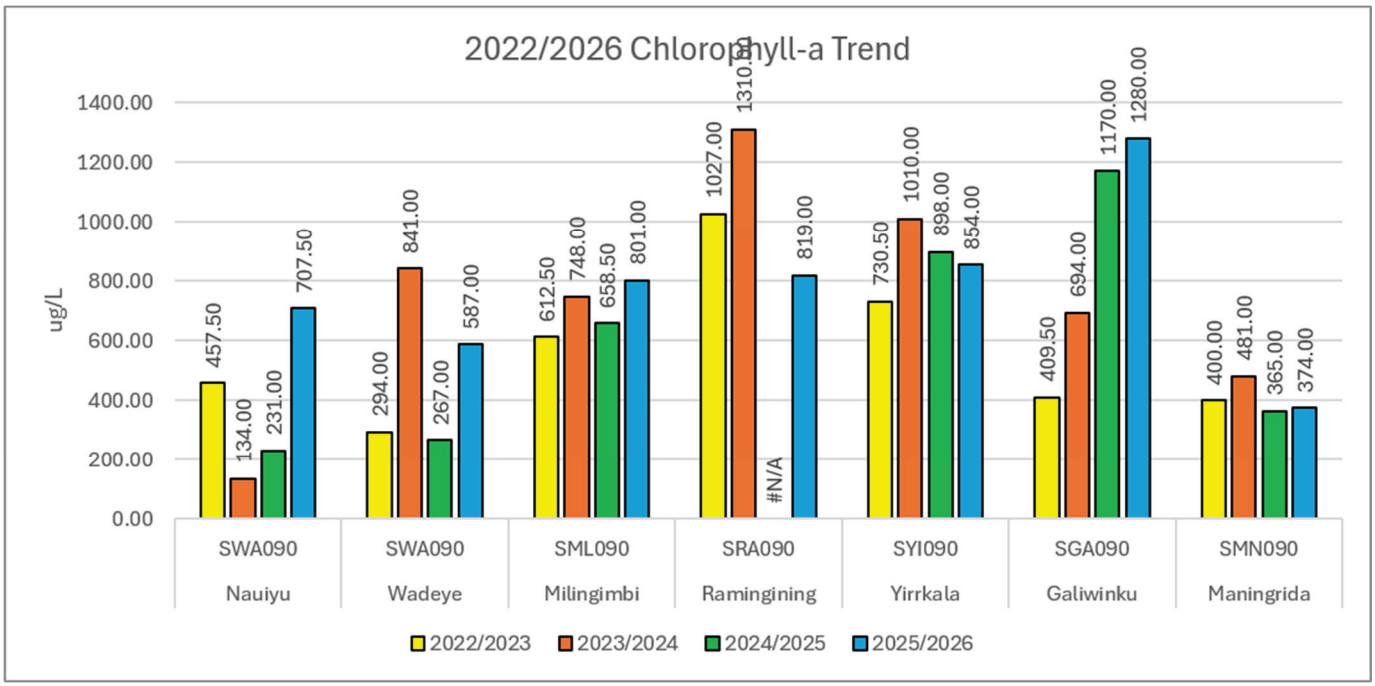

Figure 10. Round 1 Chlorophyll-a Trend

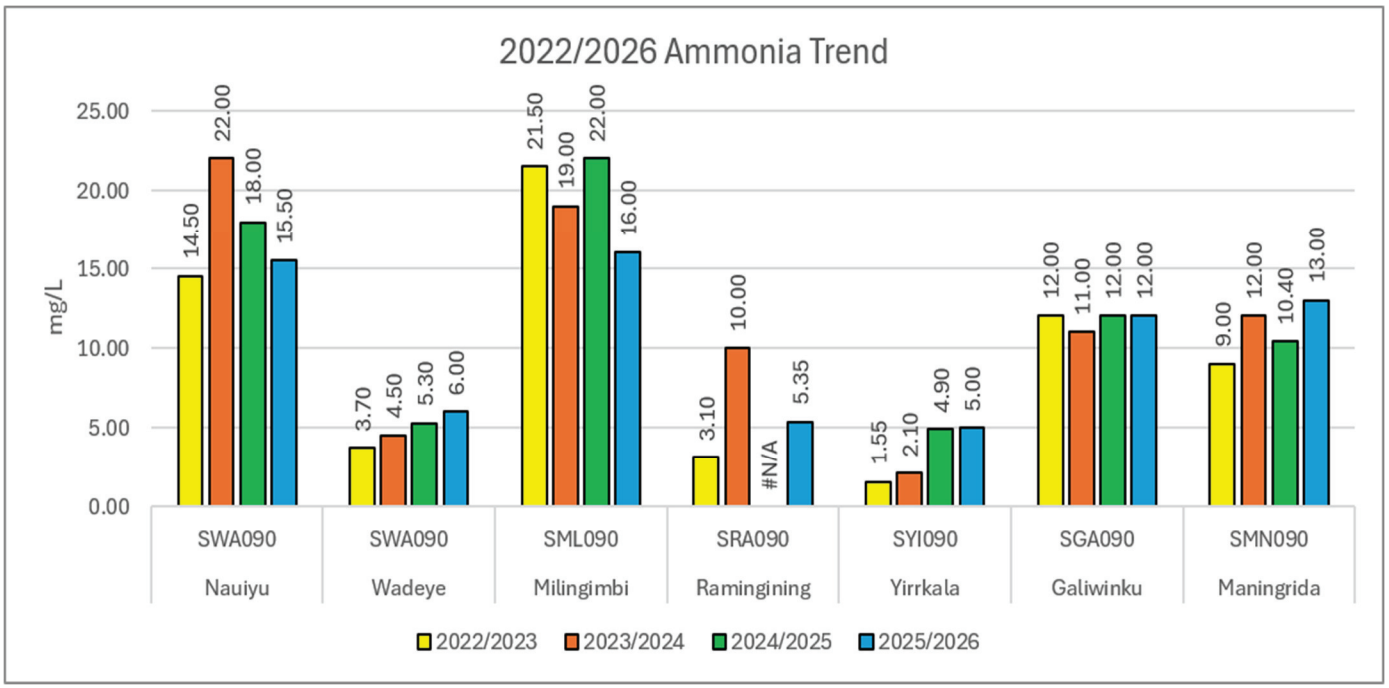

Figure 11. Round 1 Ammonia Trend

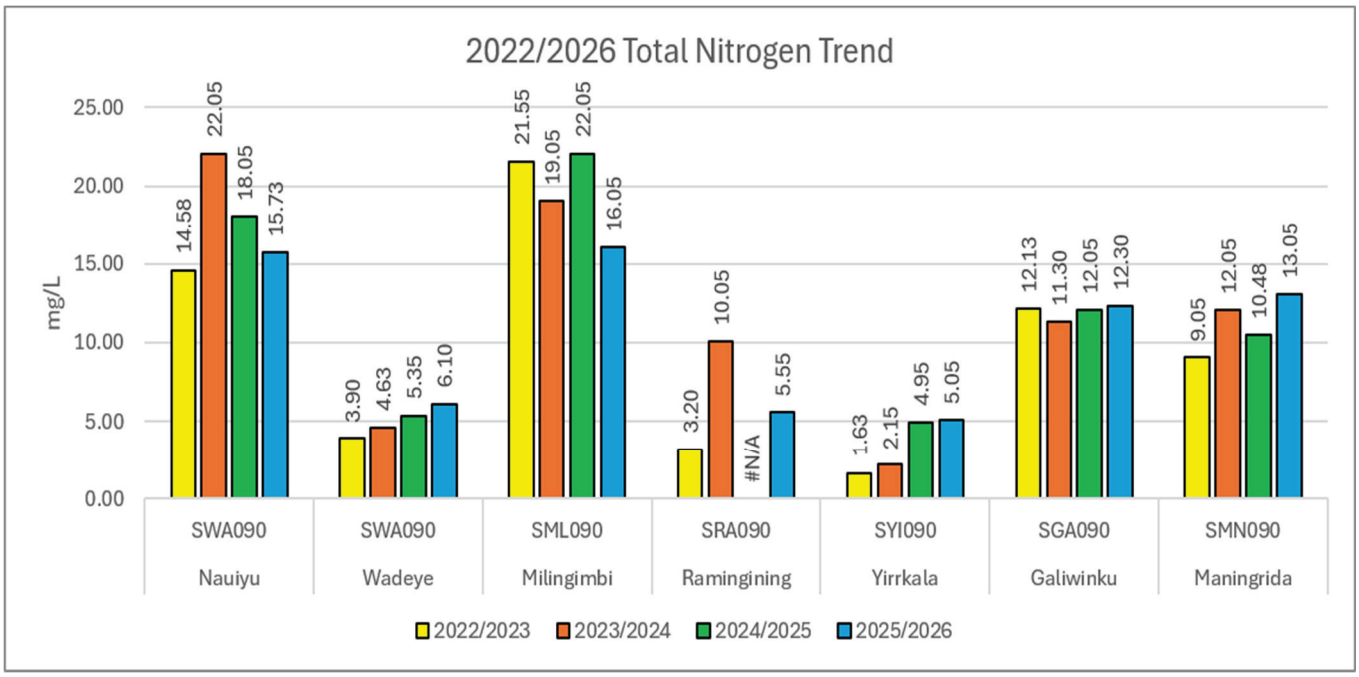

Figure 12. Round 1 Total Nitrogen Trend

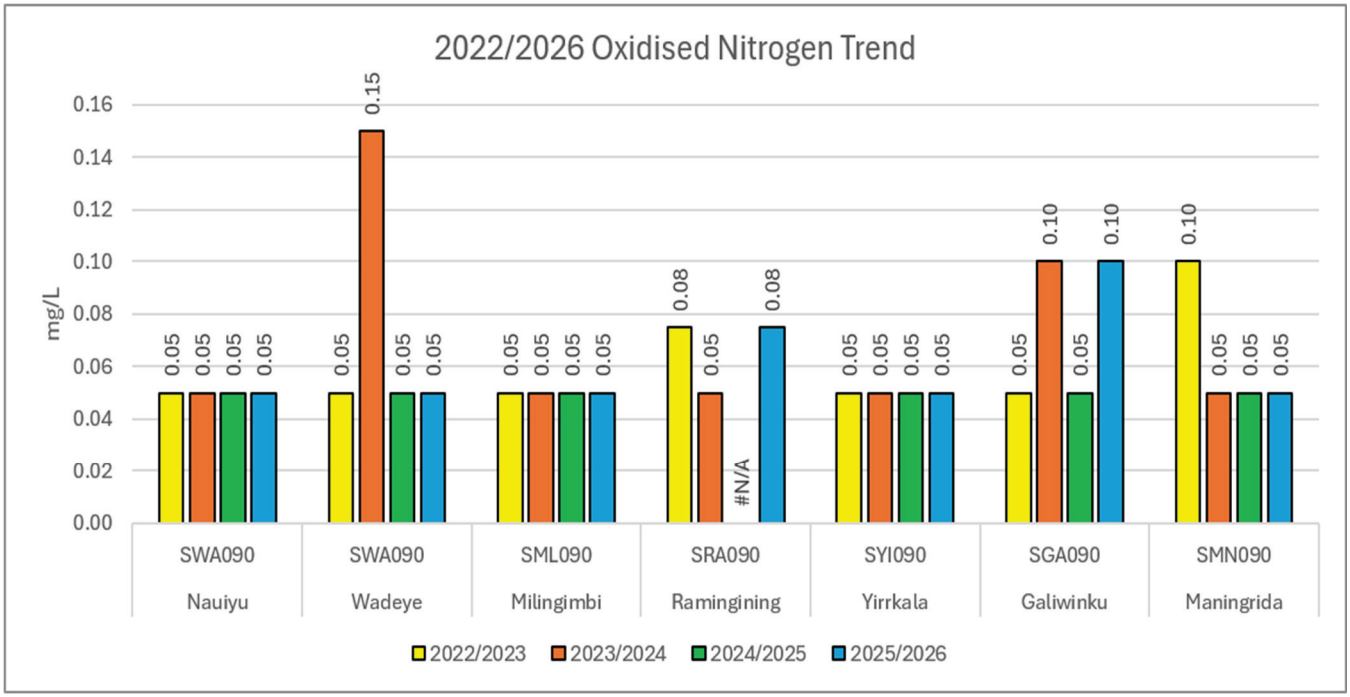

Figure 13. Round 1 Oxidised Nitrogen Trend

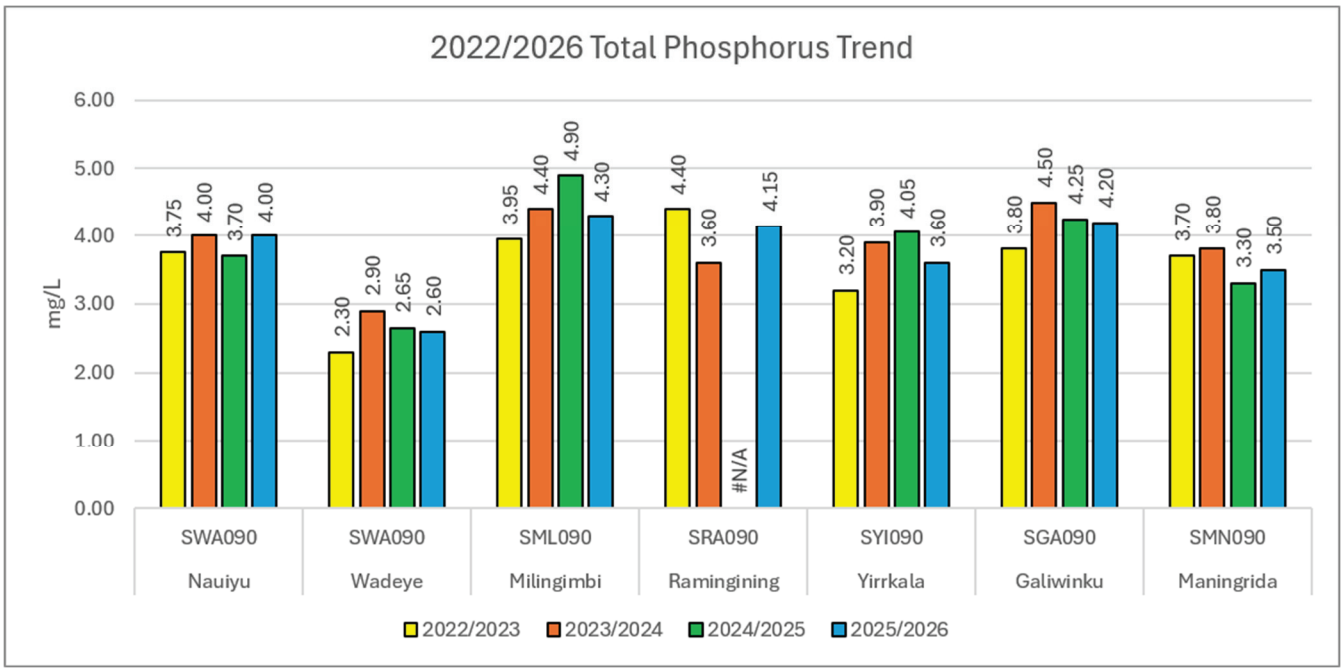

Figure 14. Round 1 Total Phosphorus Trend

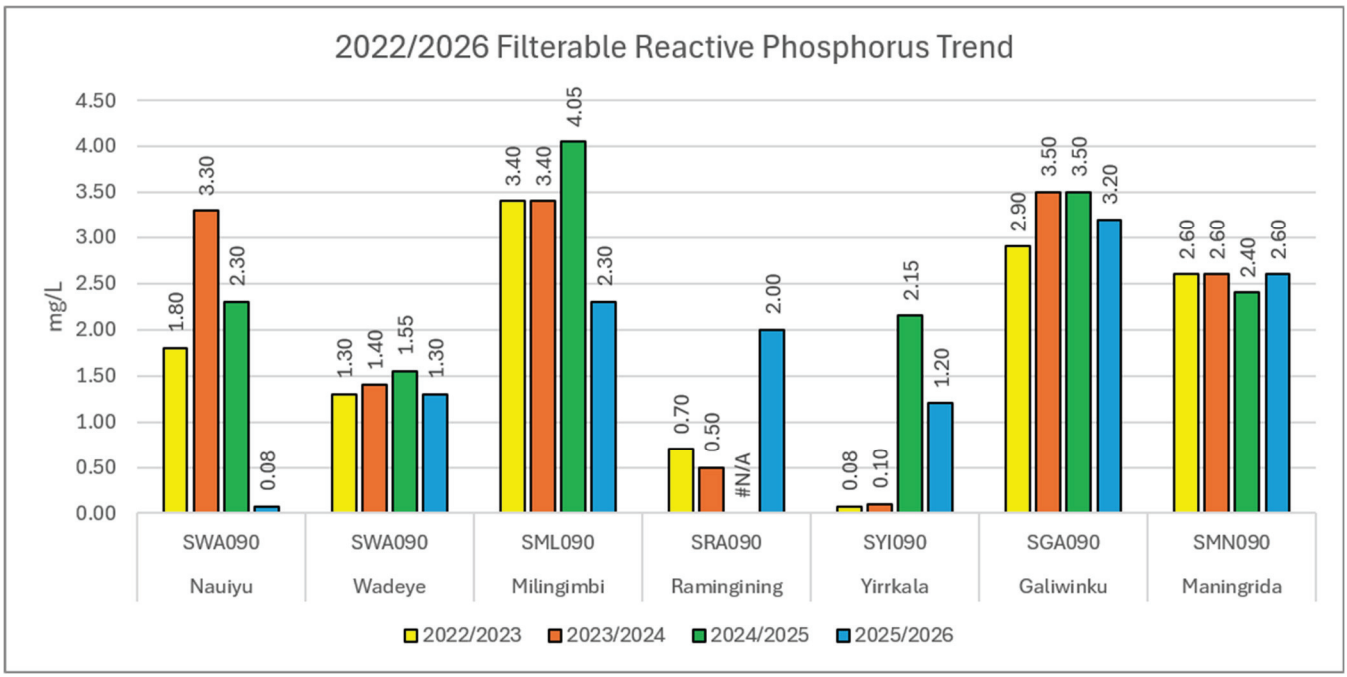

Figure 15. Round 1 Filterable Reactive Phosphorus Trend

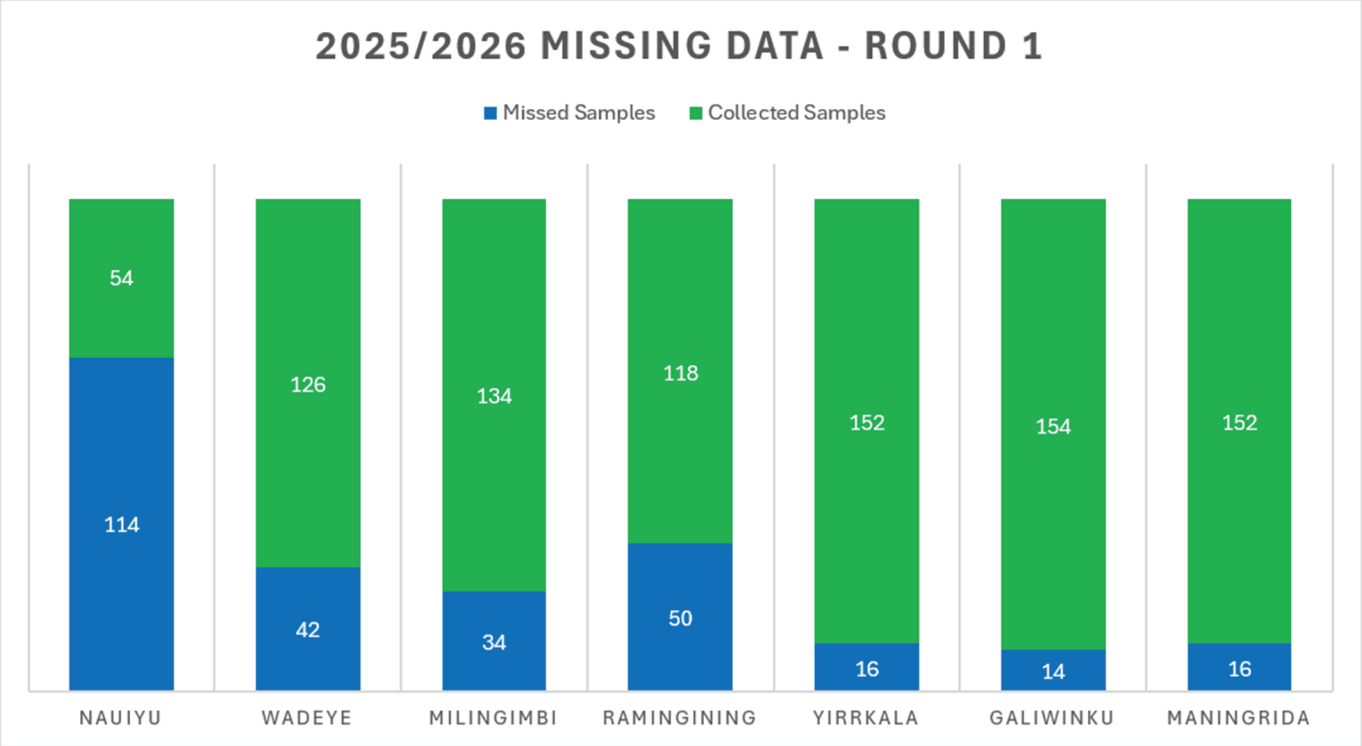

Figure 16. 2025/26 Missing Data - Round 1

Round 2

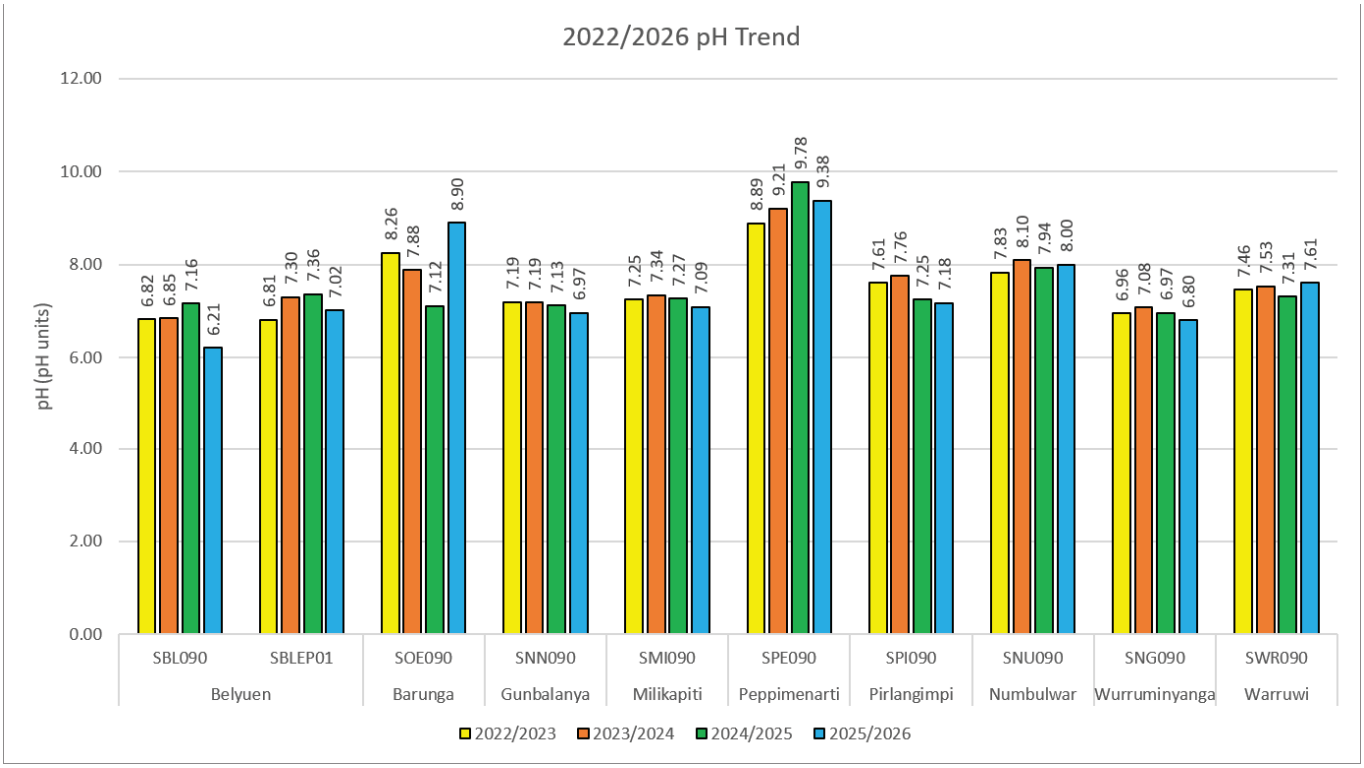

Figure 17. Round 2 pH Trend

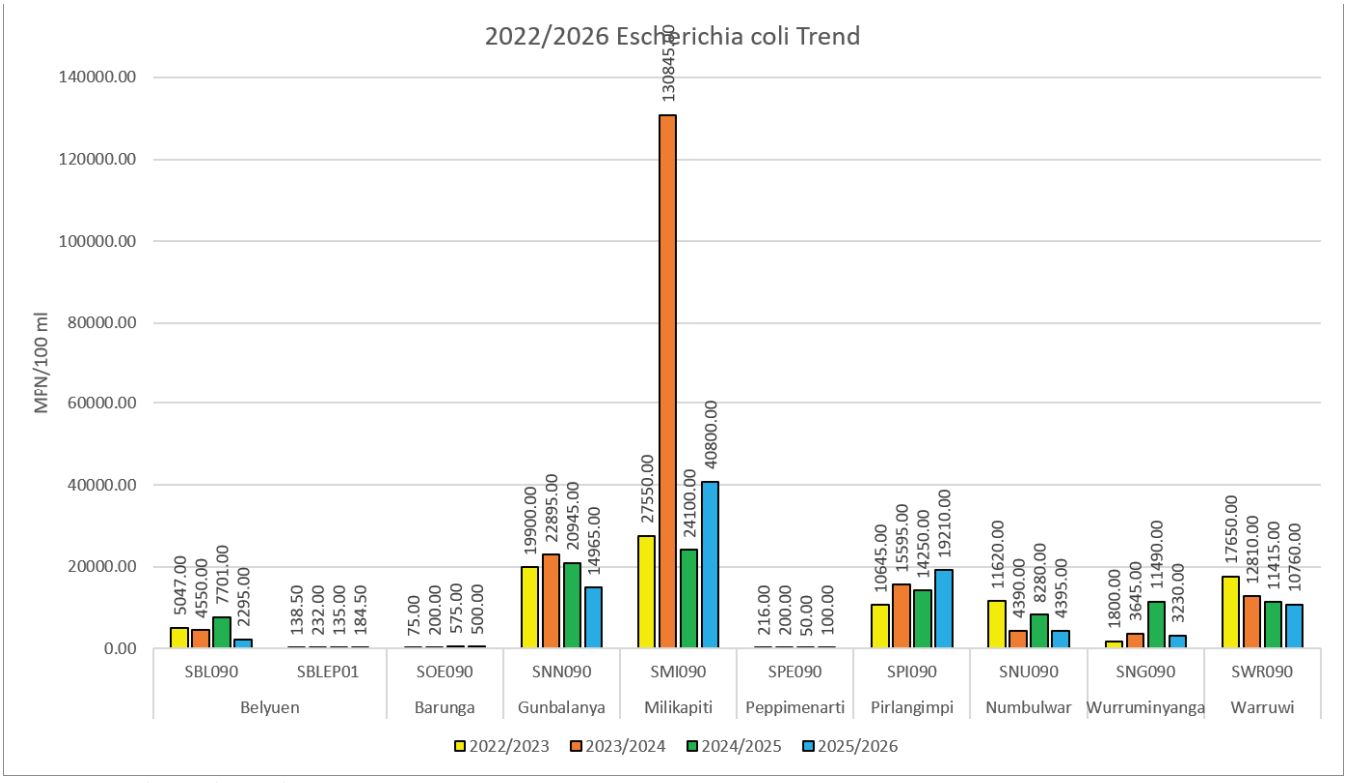

Figure 18. Round 2 E.coli Trend

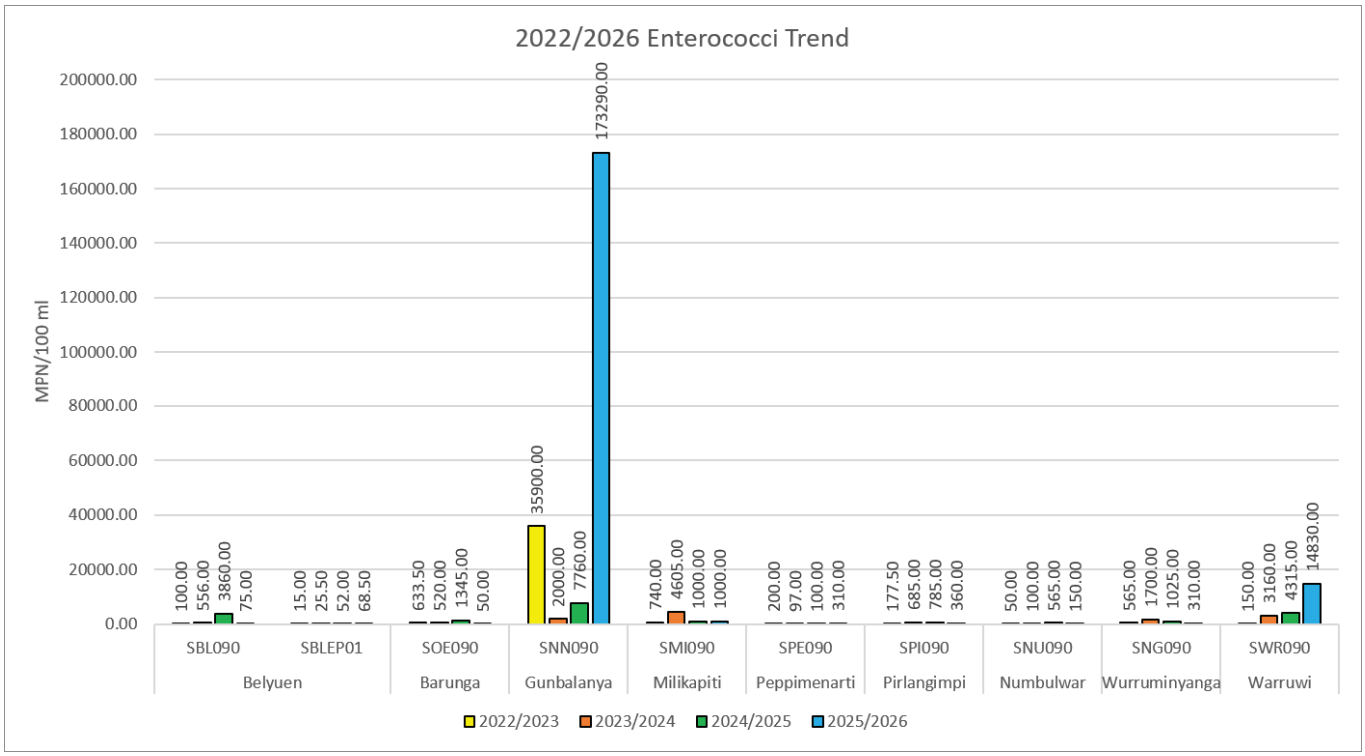

Figure 19. Round 2 Enterococci Trend

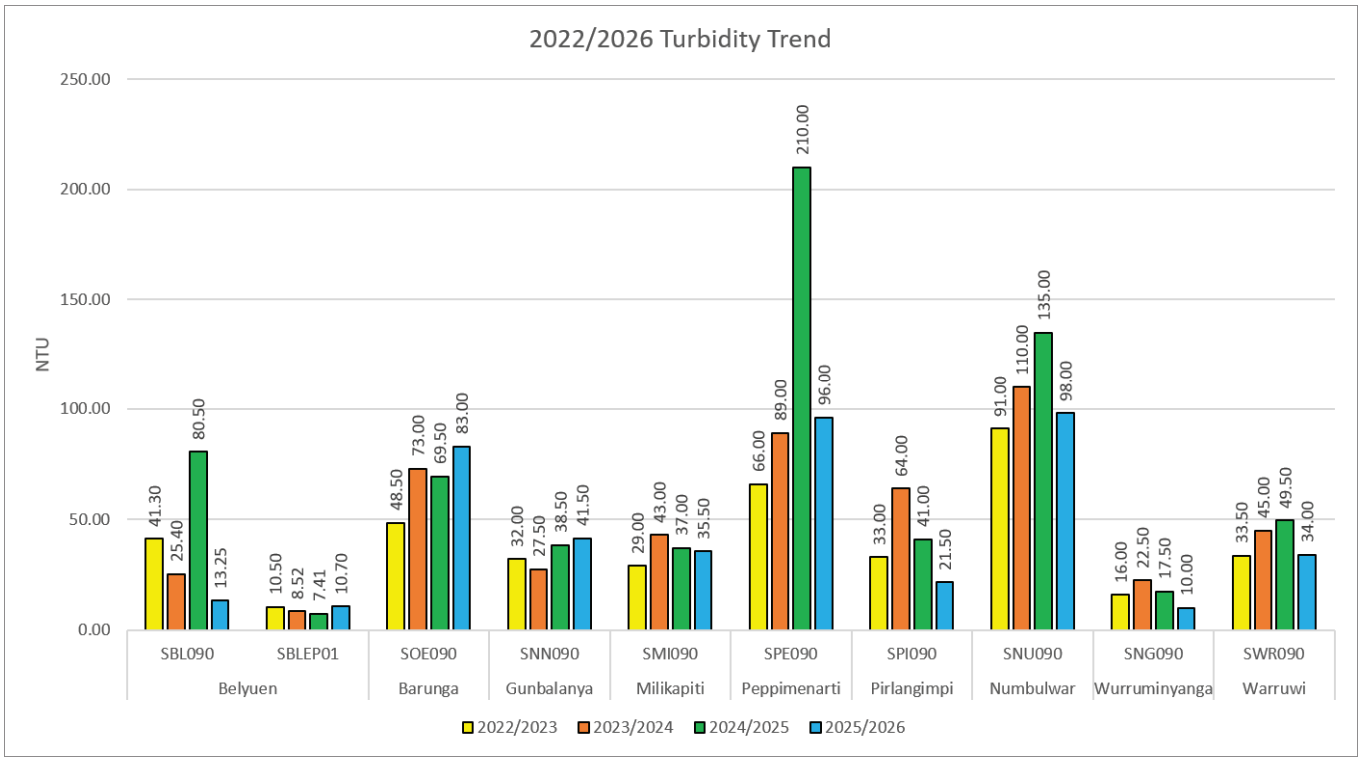

Figure 20. Round 2 Turbidity Trend

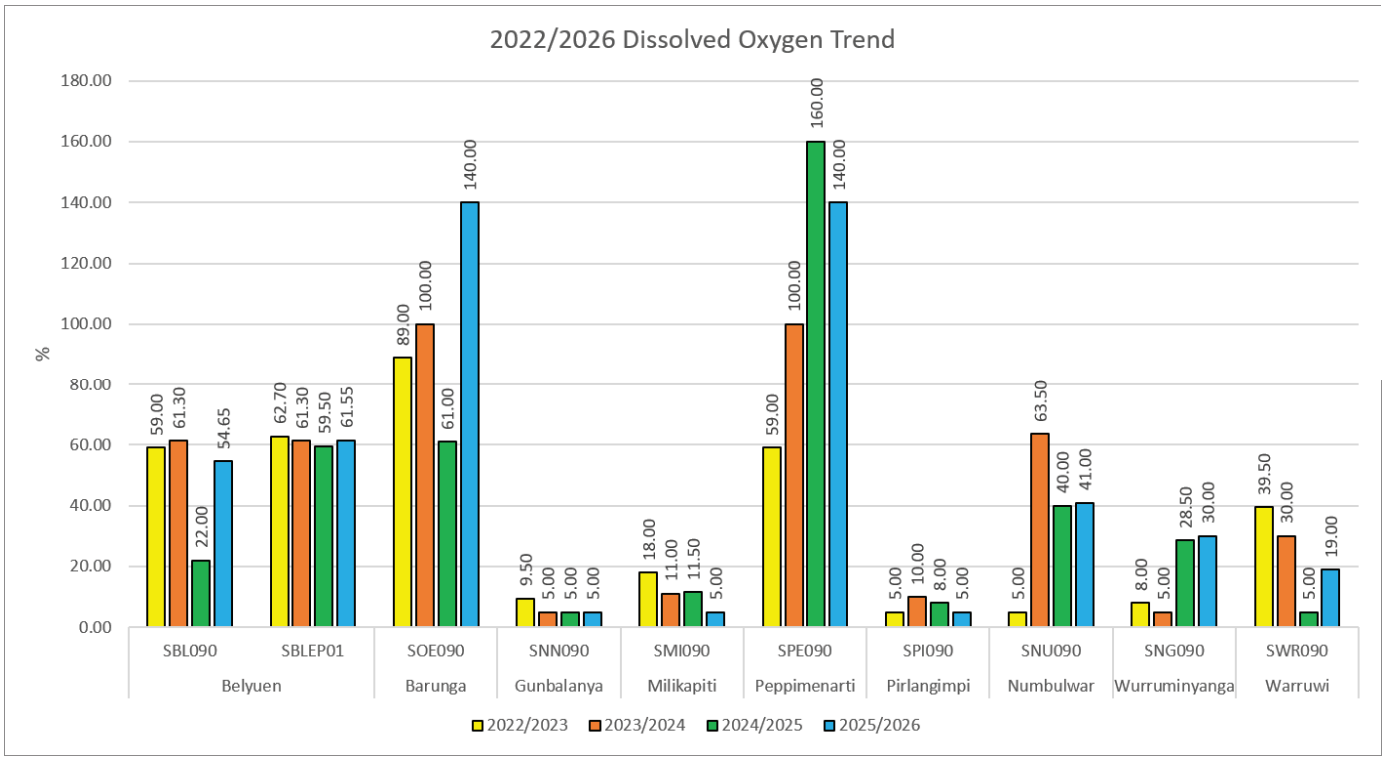

Figure 21. Round 2 Dissolved Oxygen Trend

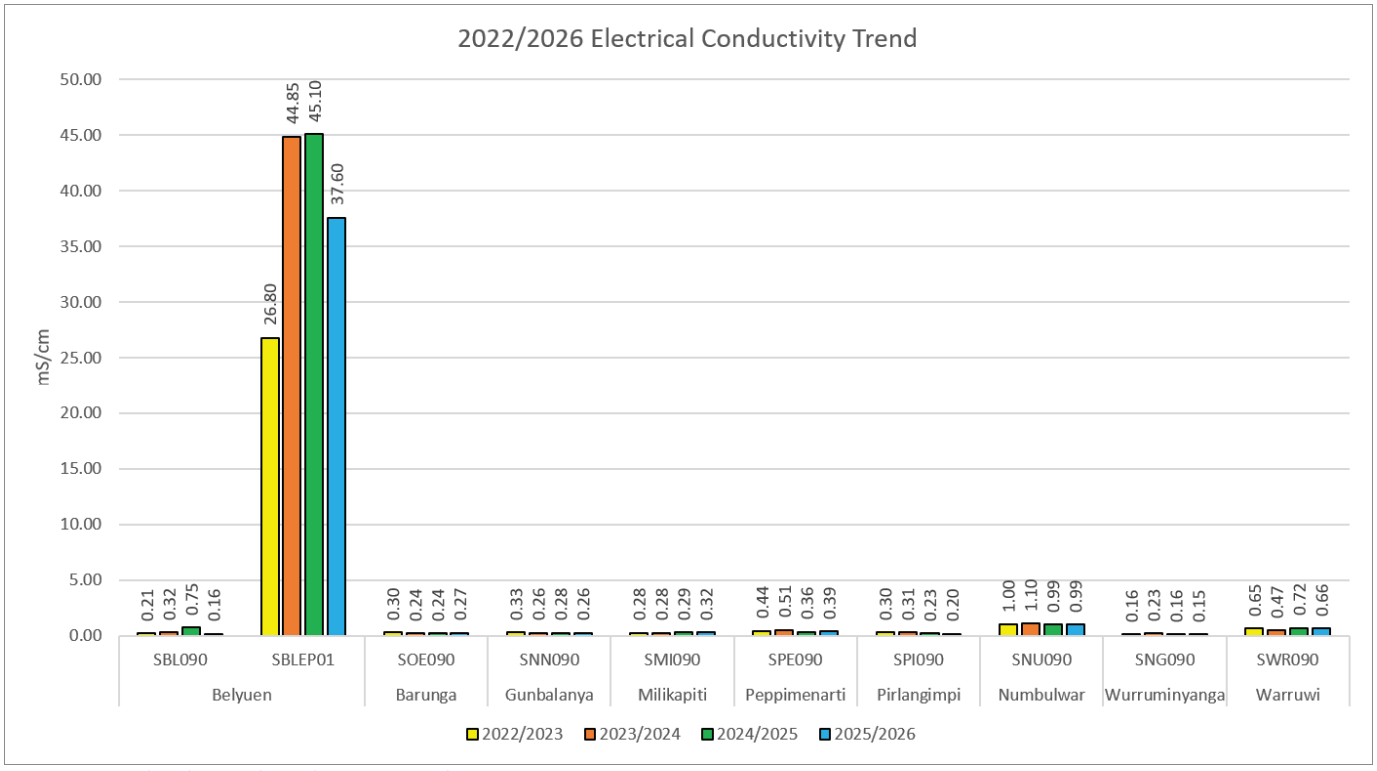

Figure 22. Round 2 Electrical Conductivity Trend

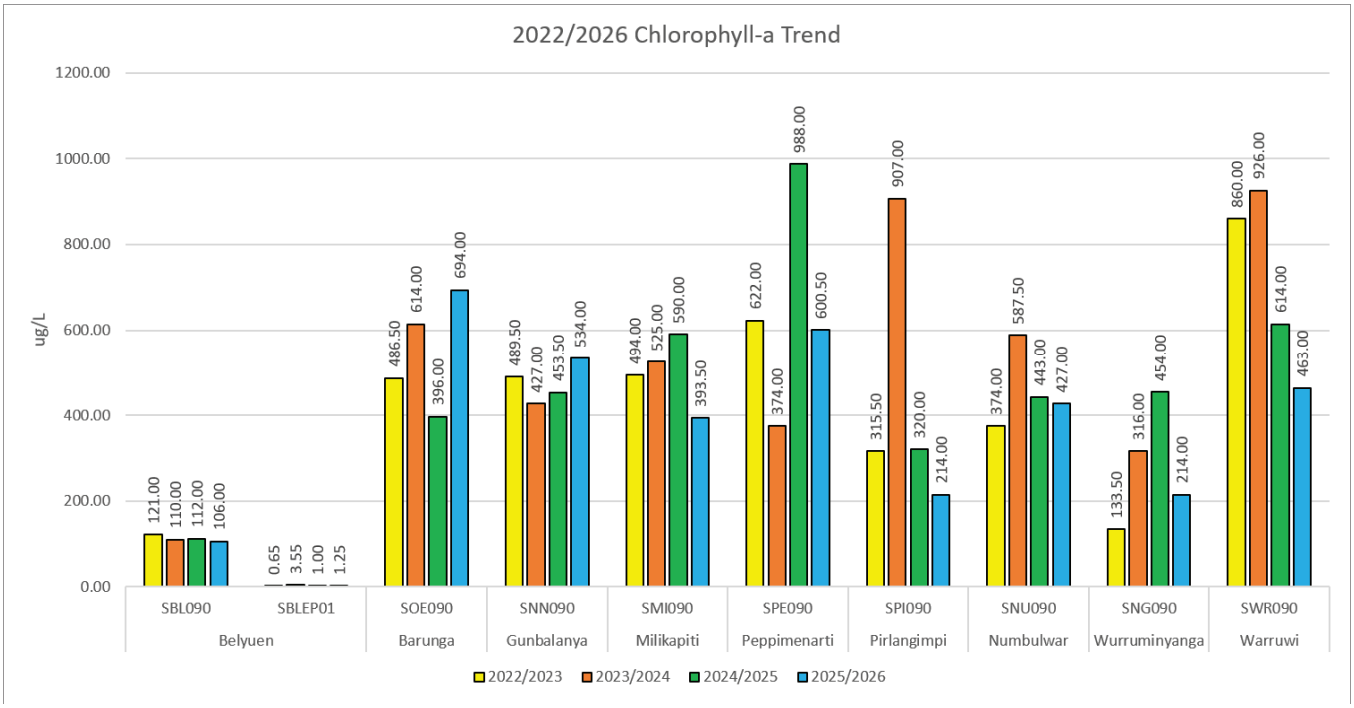

Figure 23. Round 2 Chlorophyll-a Trend

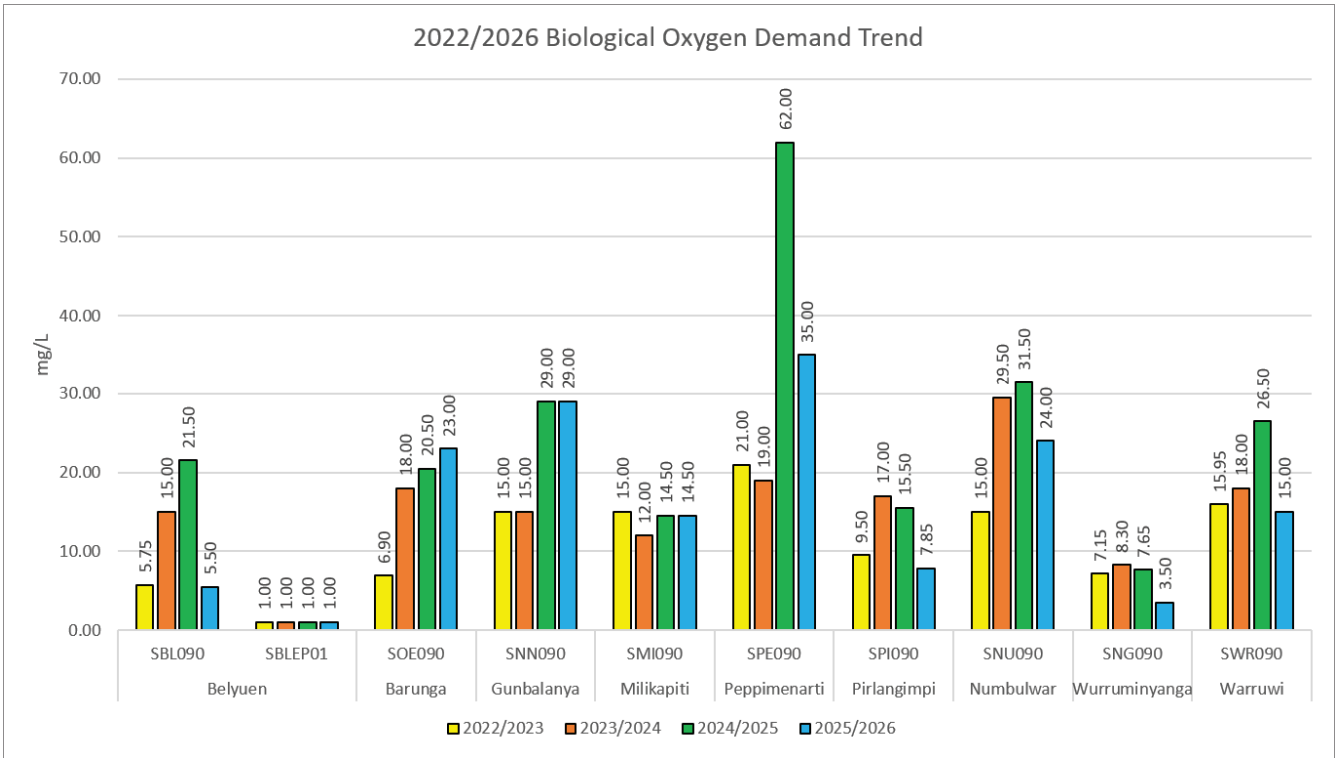

Figure 24. Round 2 Biological Oxygen Demand Trend

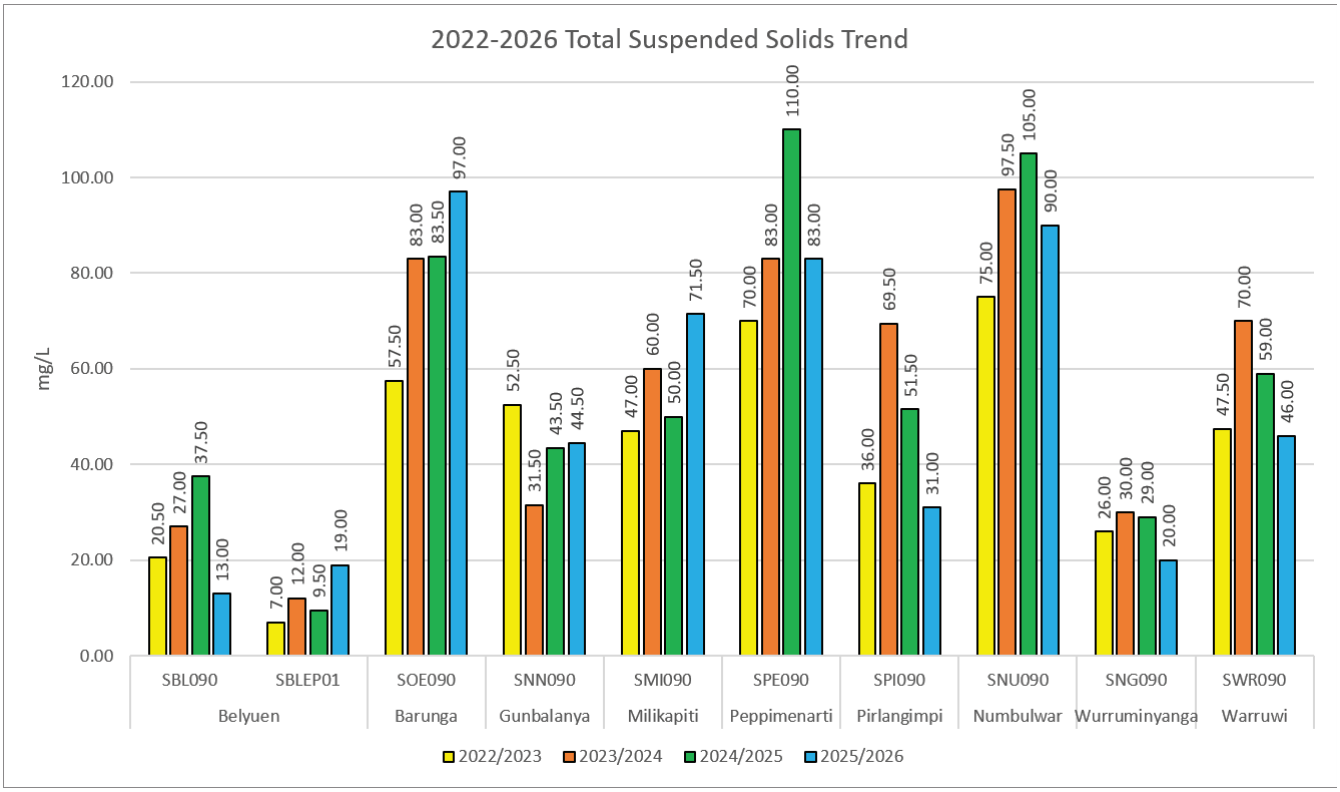

Figure 25. Round 2 Total Suspended Solids Trend

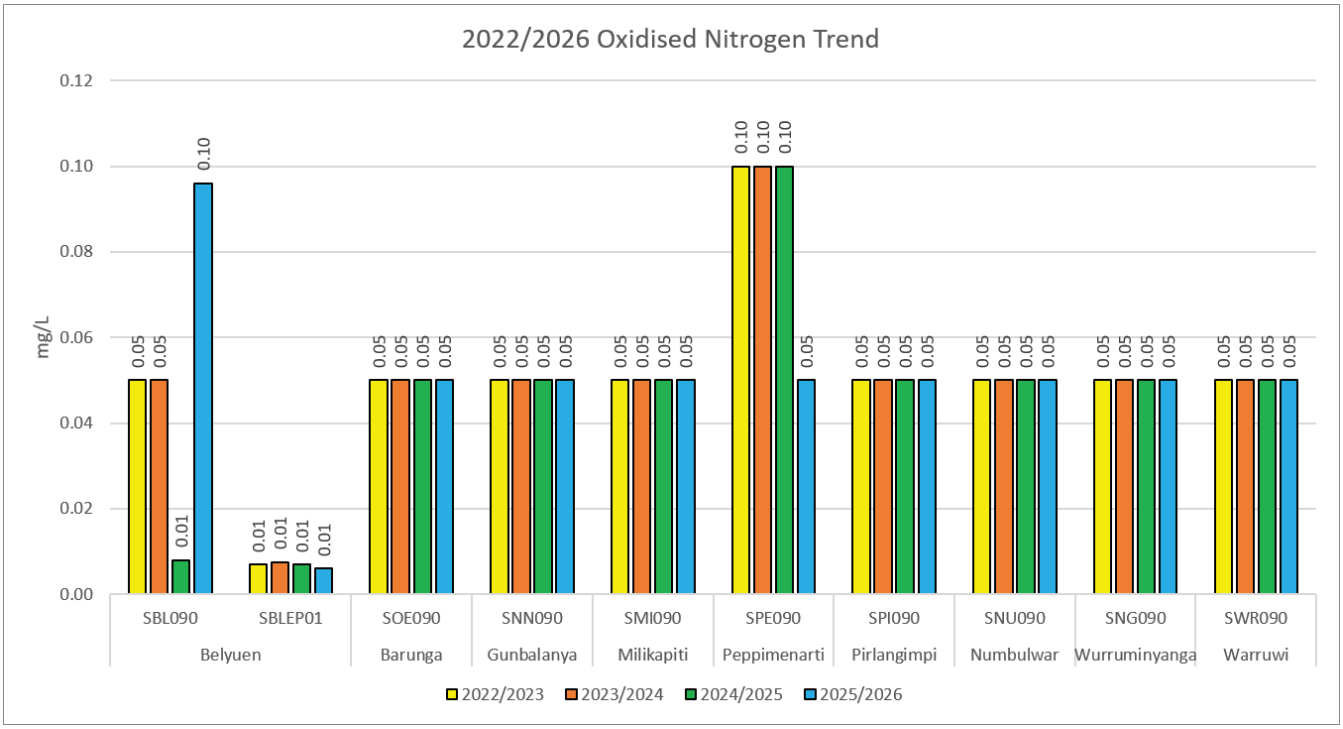

Figure 26. Round 2 Oxidised Nitrogen Trend

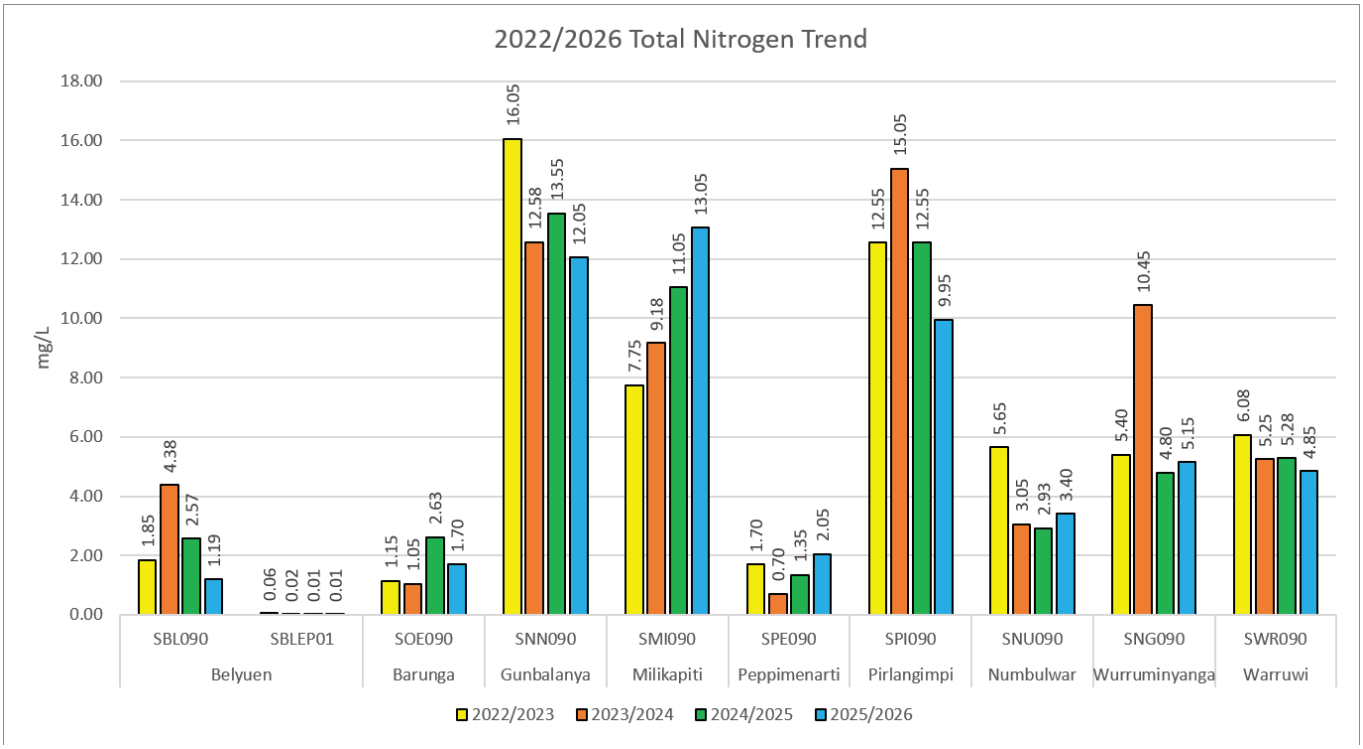

Figure 27. Round 2 Total Nitrogen Trend

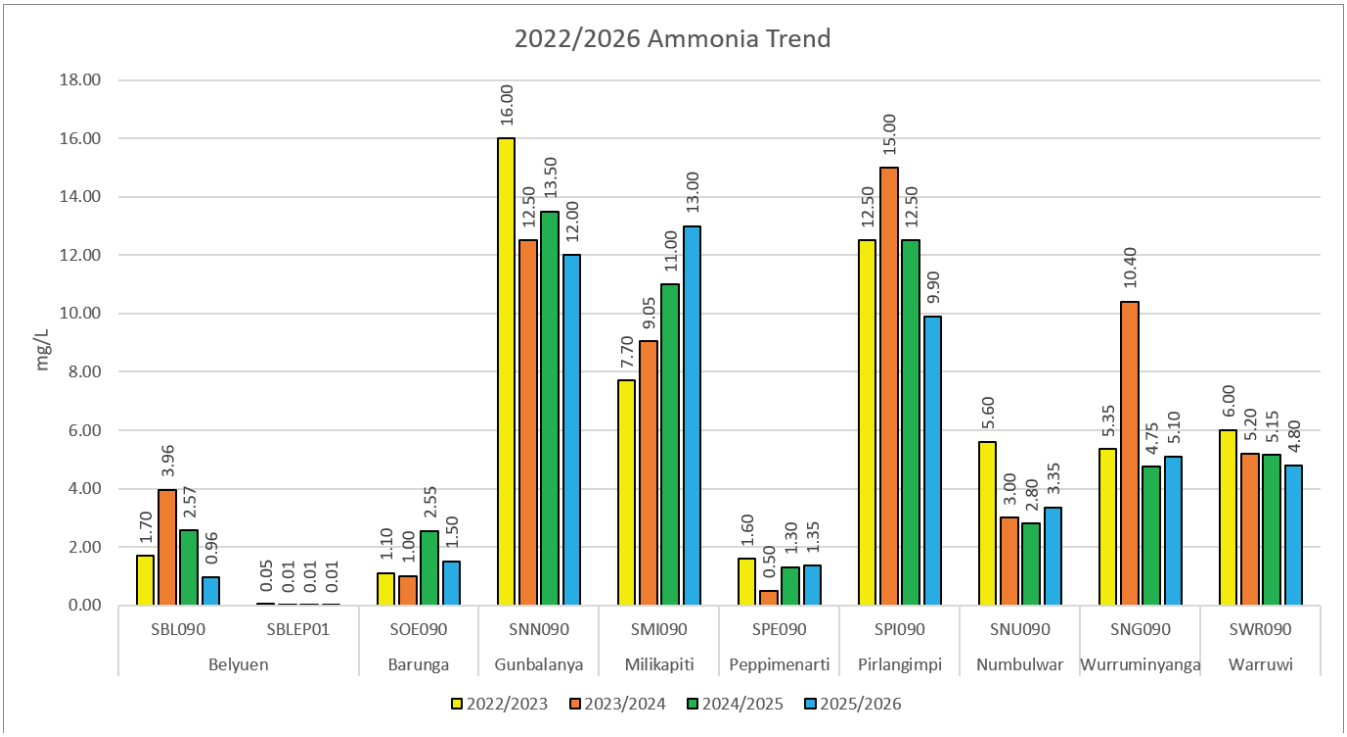

Figure 28. Round 2 Ammonia Trend

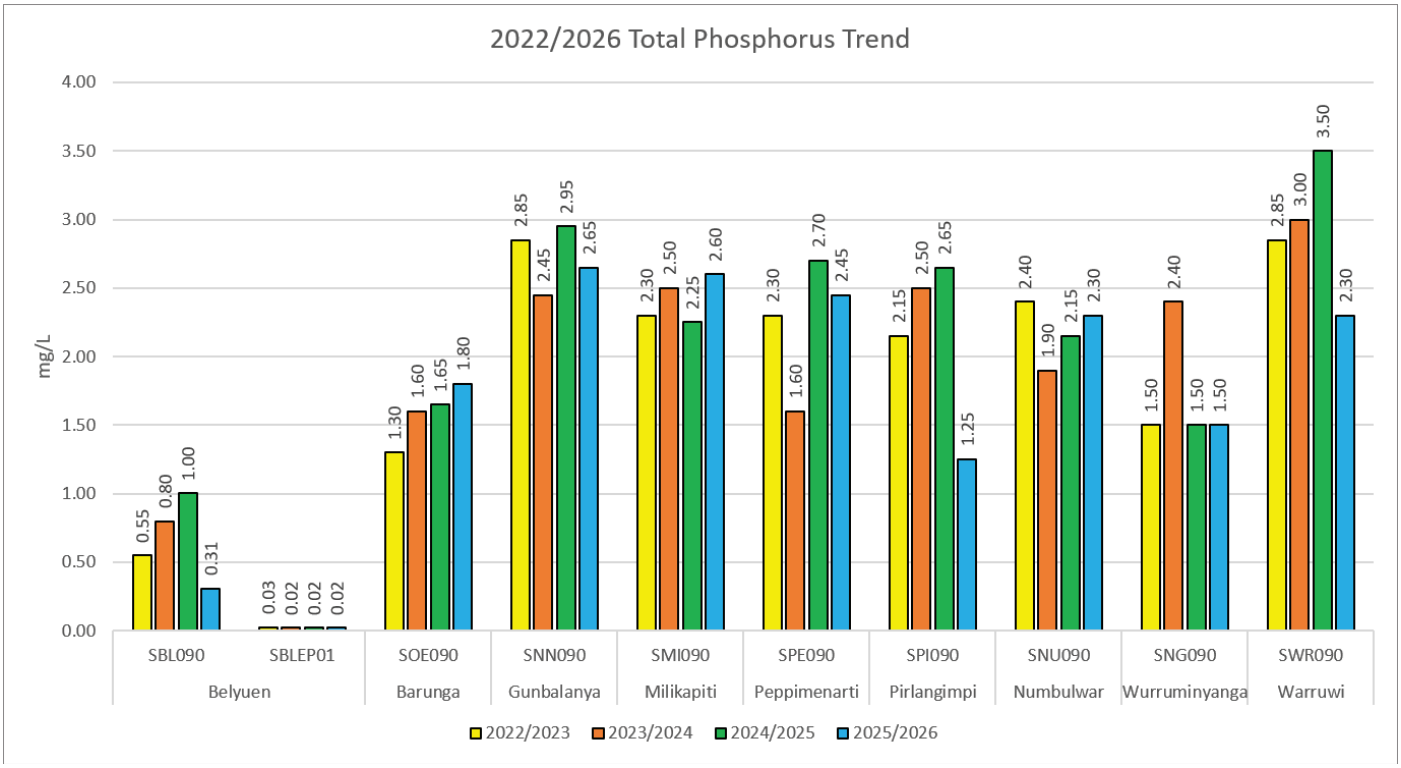

Figure 29. Round 2 Total Phosphorus Trend

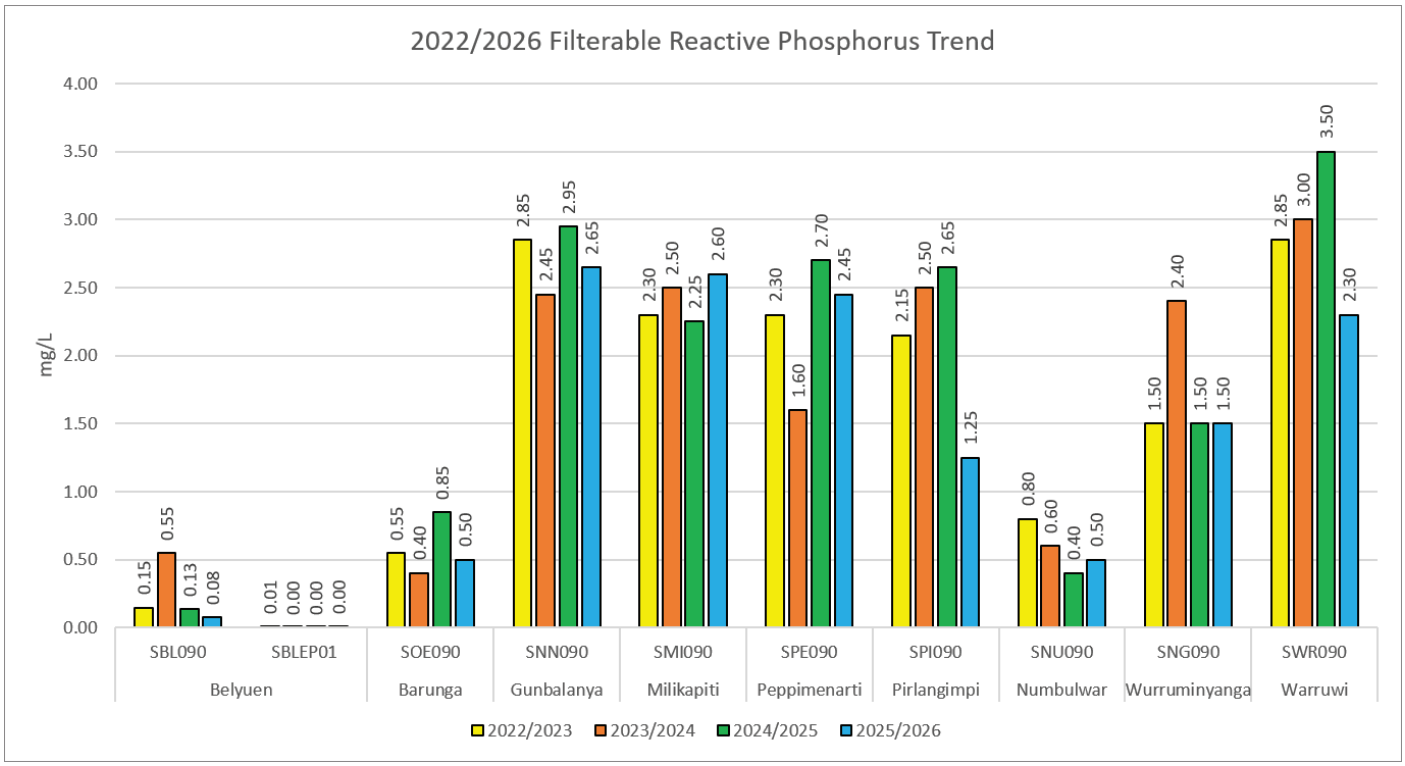

Figure 30. Round 2 Filterable Reactive Phosphorus Trend

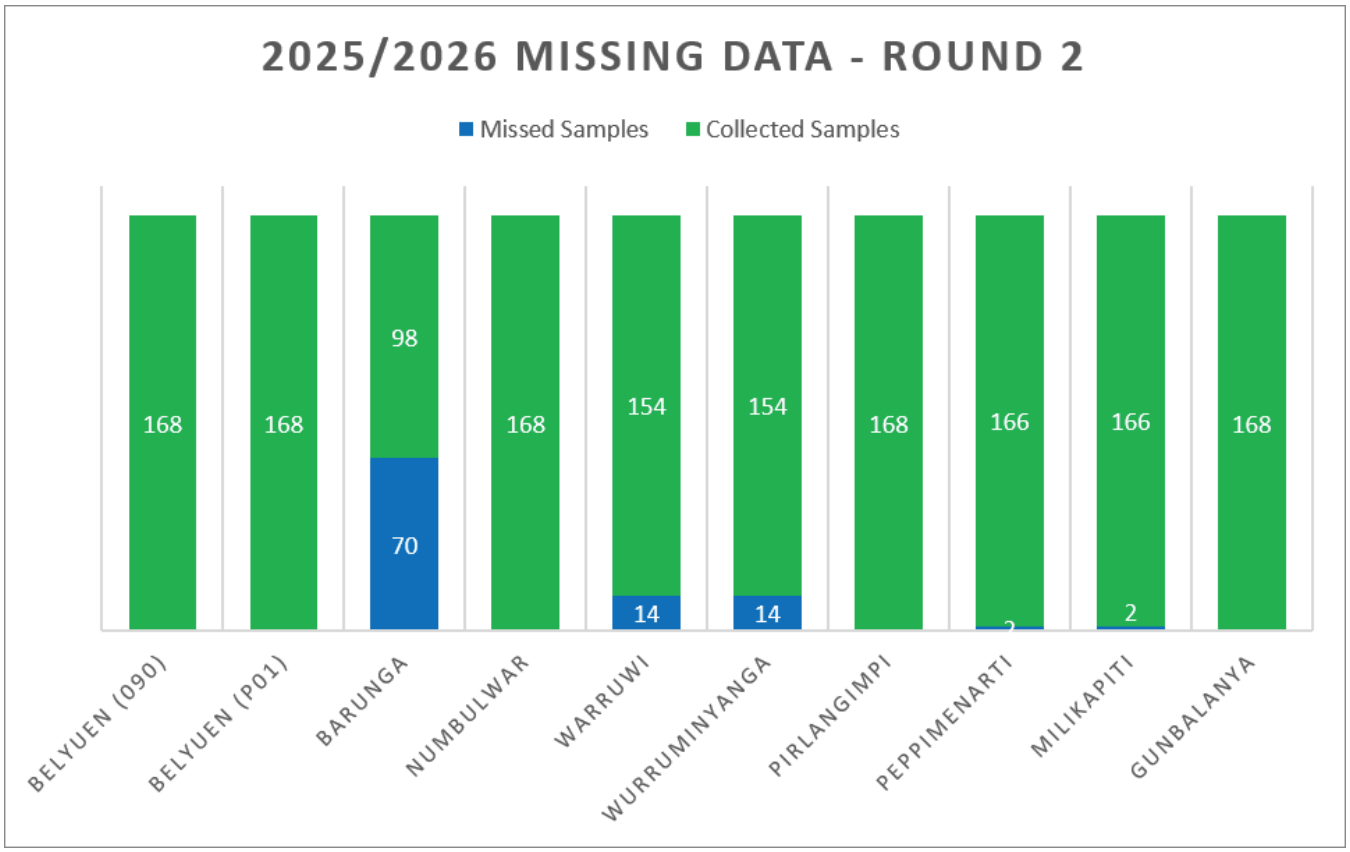

Figure 31. 2025/26 Missing Data - Round 2

Round 3

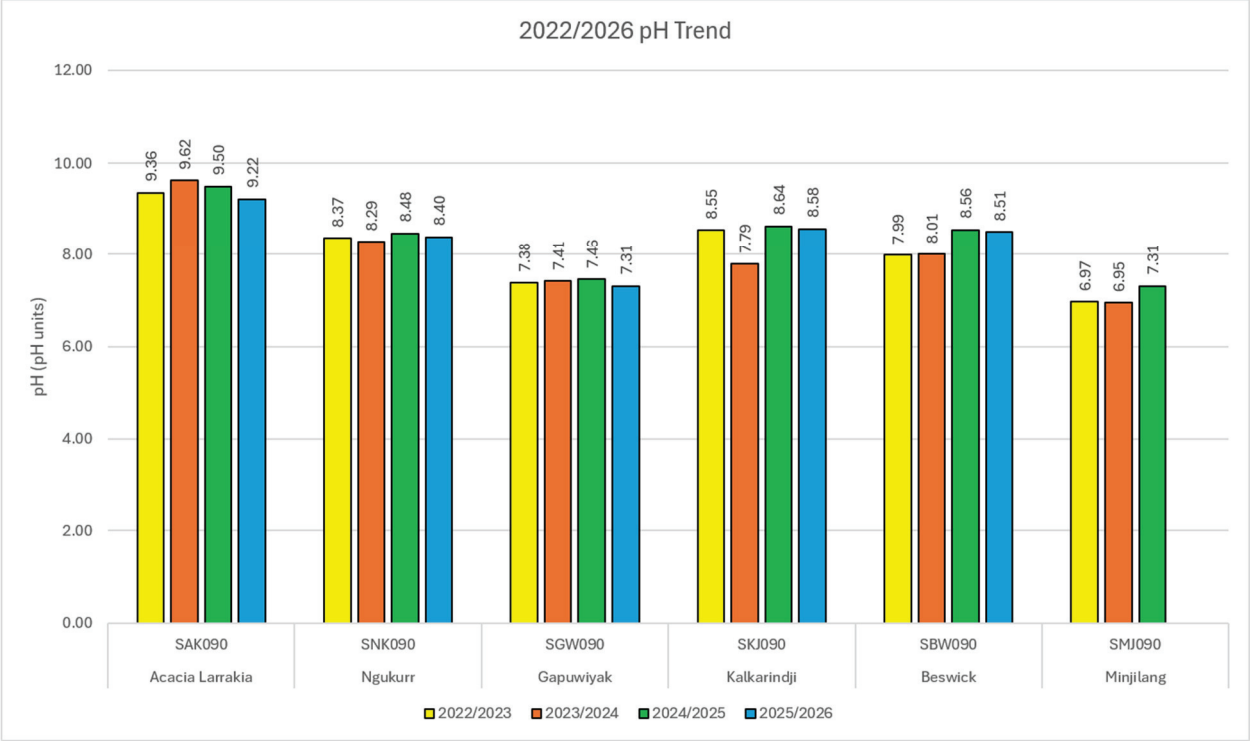

Figure 32. Round 3 pH Trend

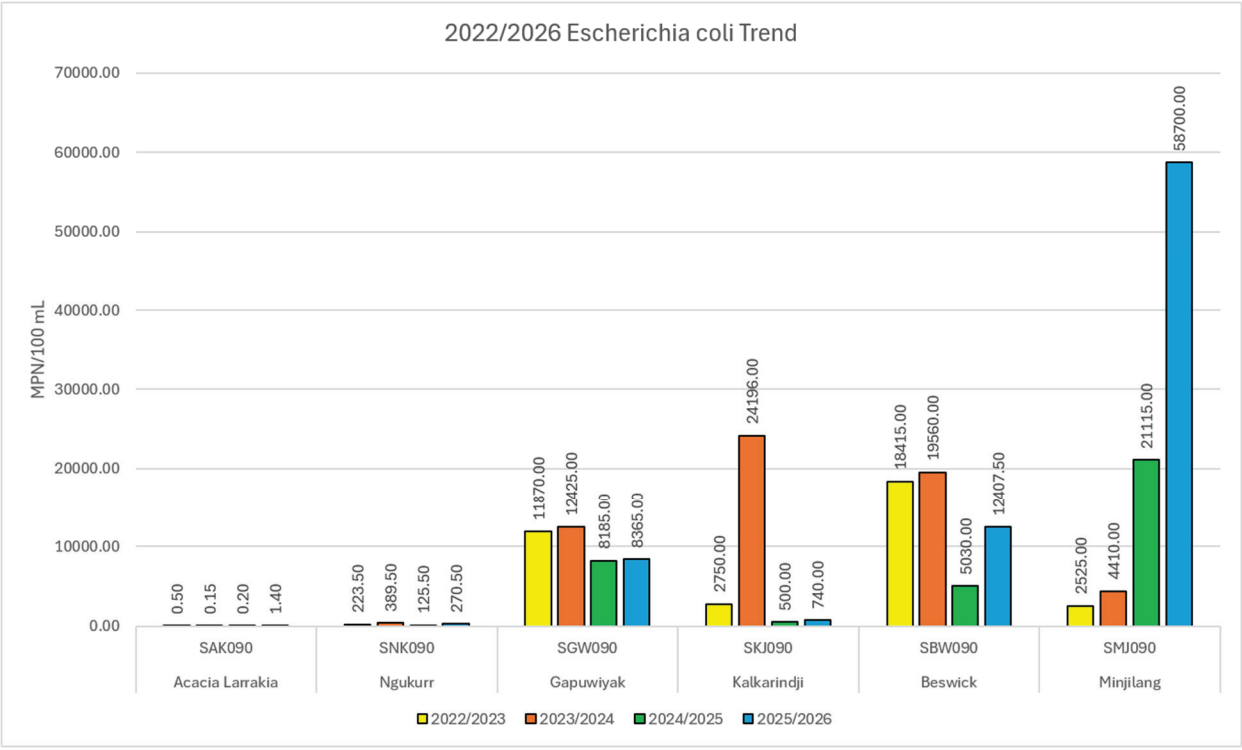

Figure 33. Round 3 E. coli Trend

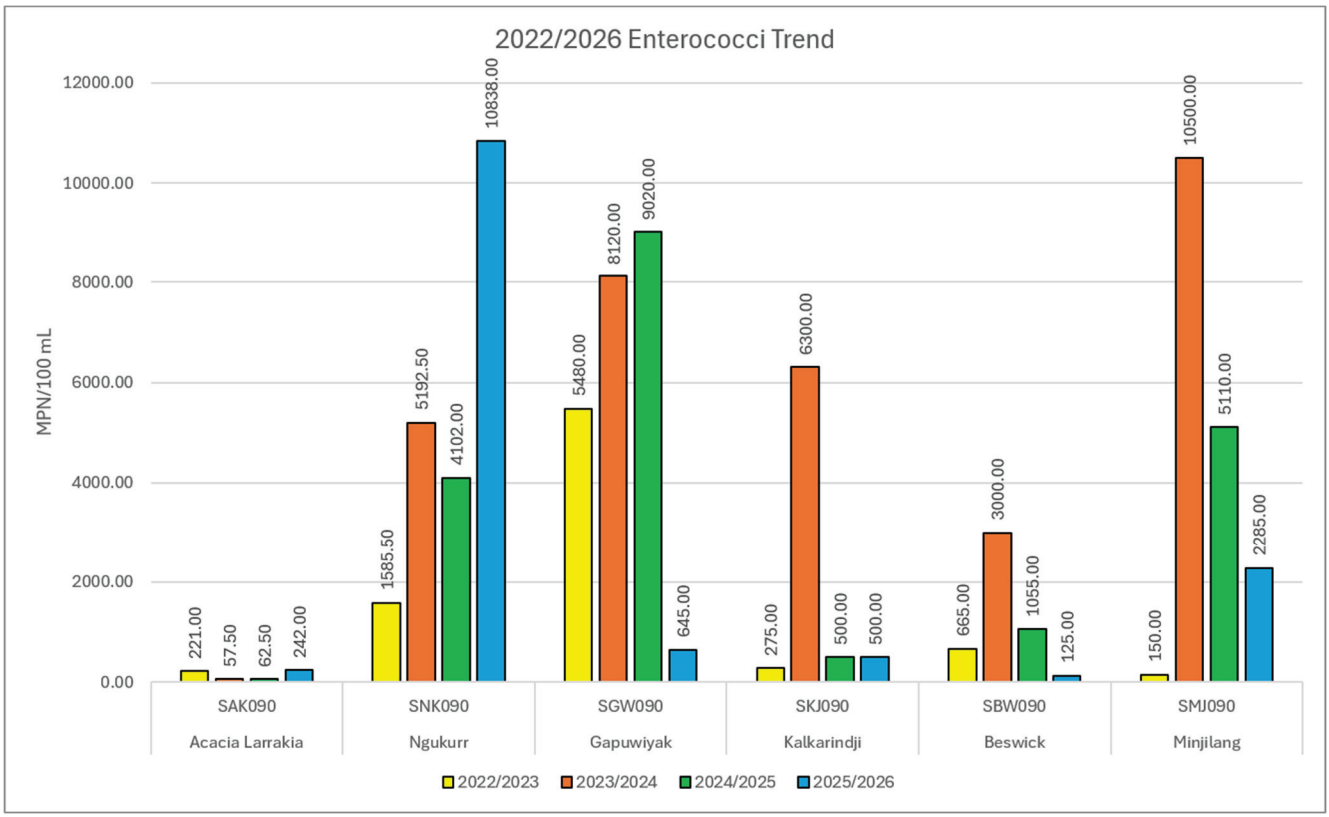

Figure 34. Round 3 Enterococci Trend

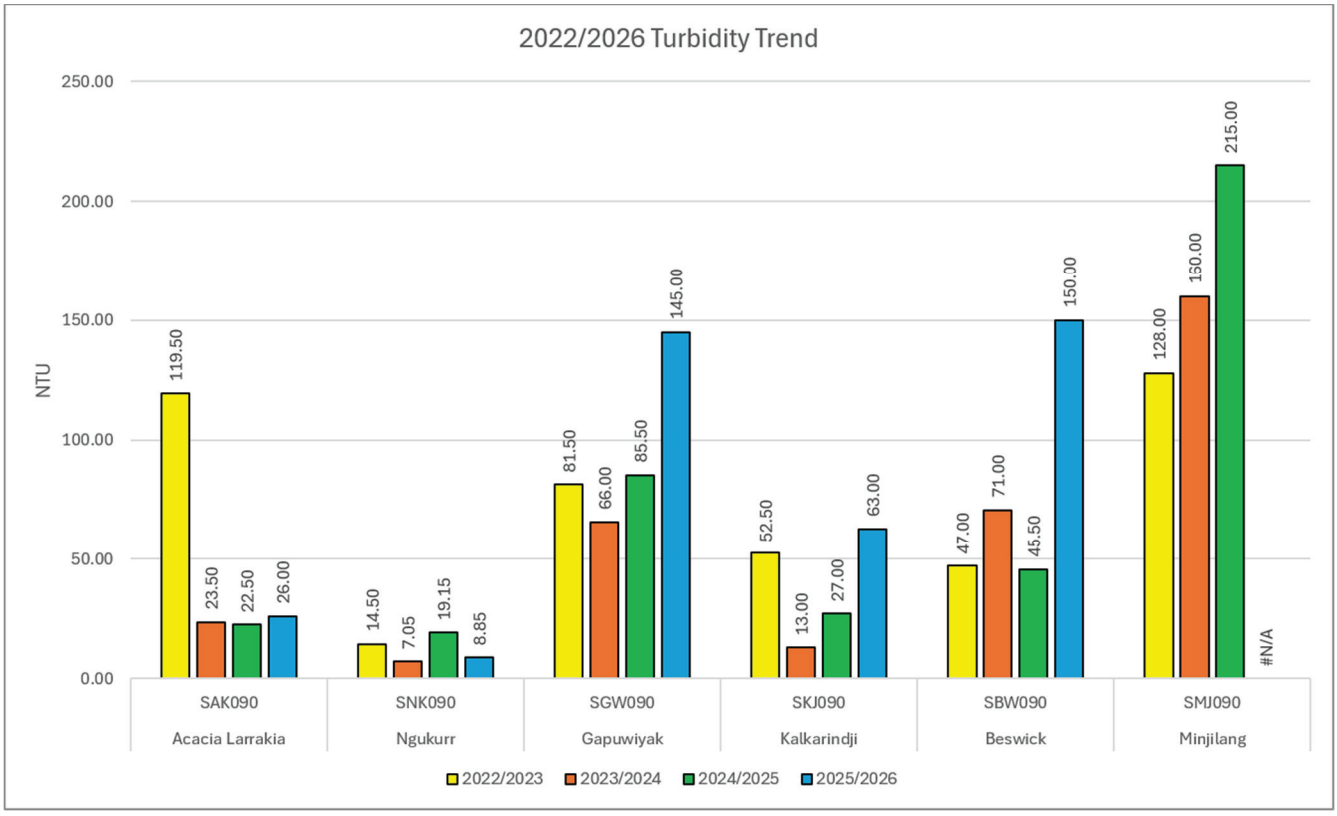

Figure 35. Round 3 Turbidity Trend

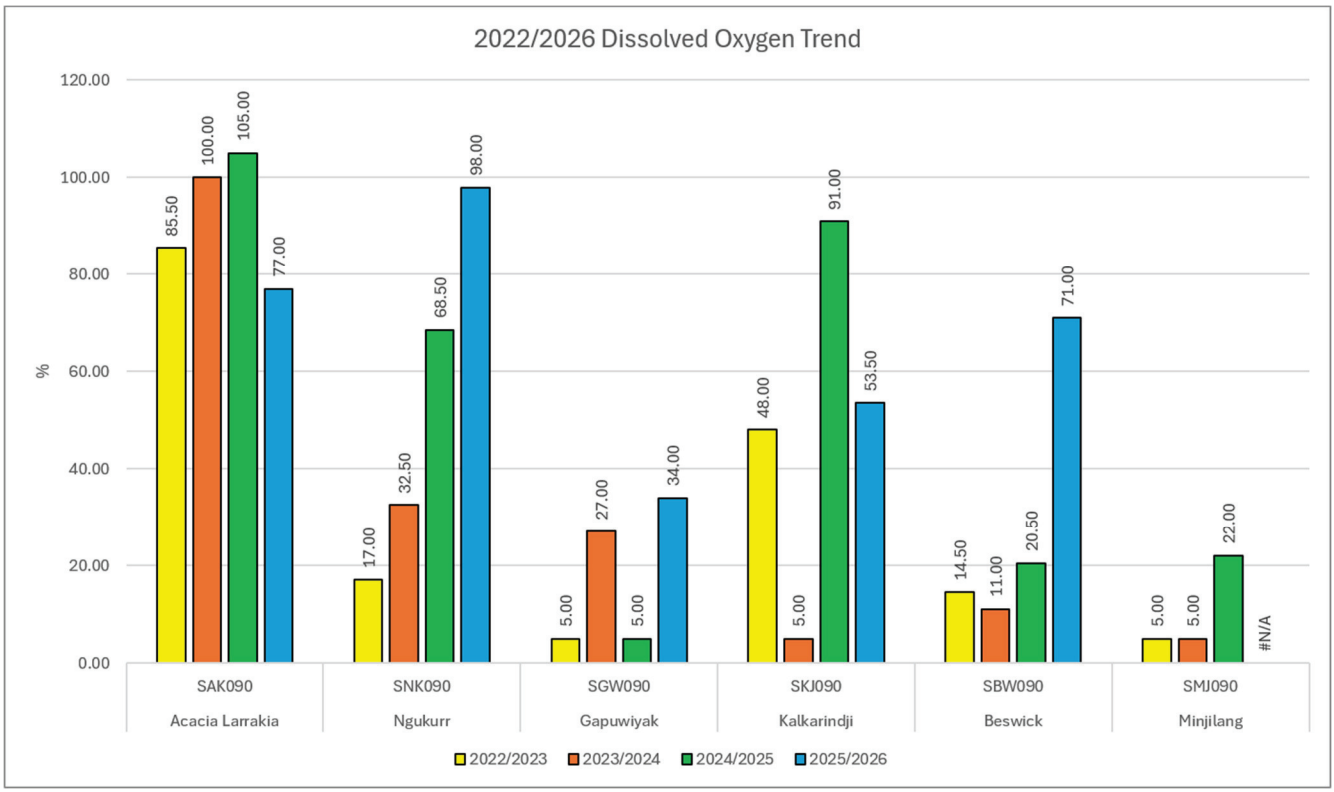

Figure 36. Round 3 Dissolved Oxygen Trend

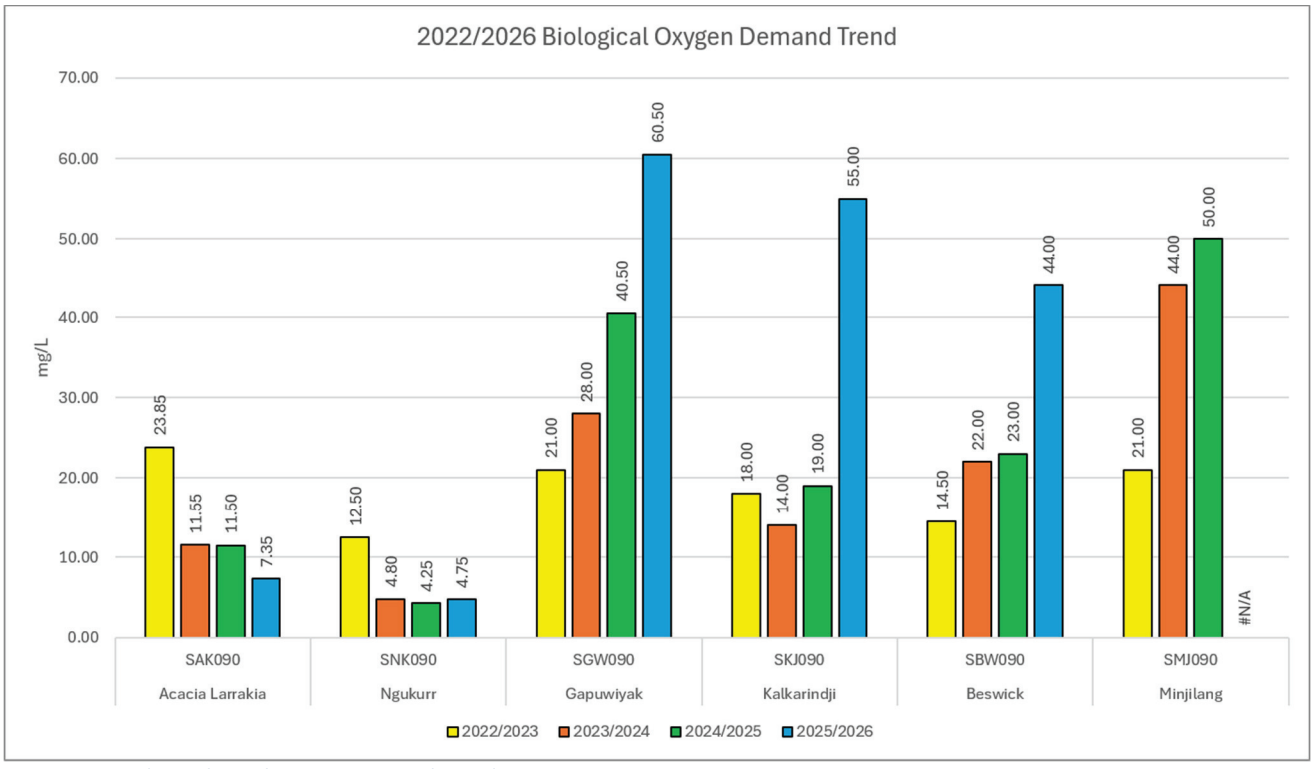

Figure 37. Round 3 Biological Oxygen Demand Trend

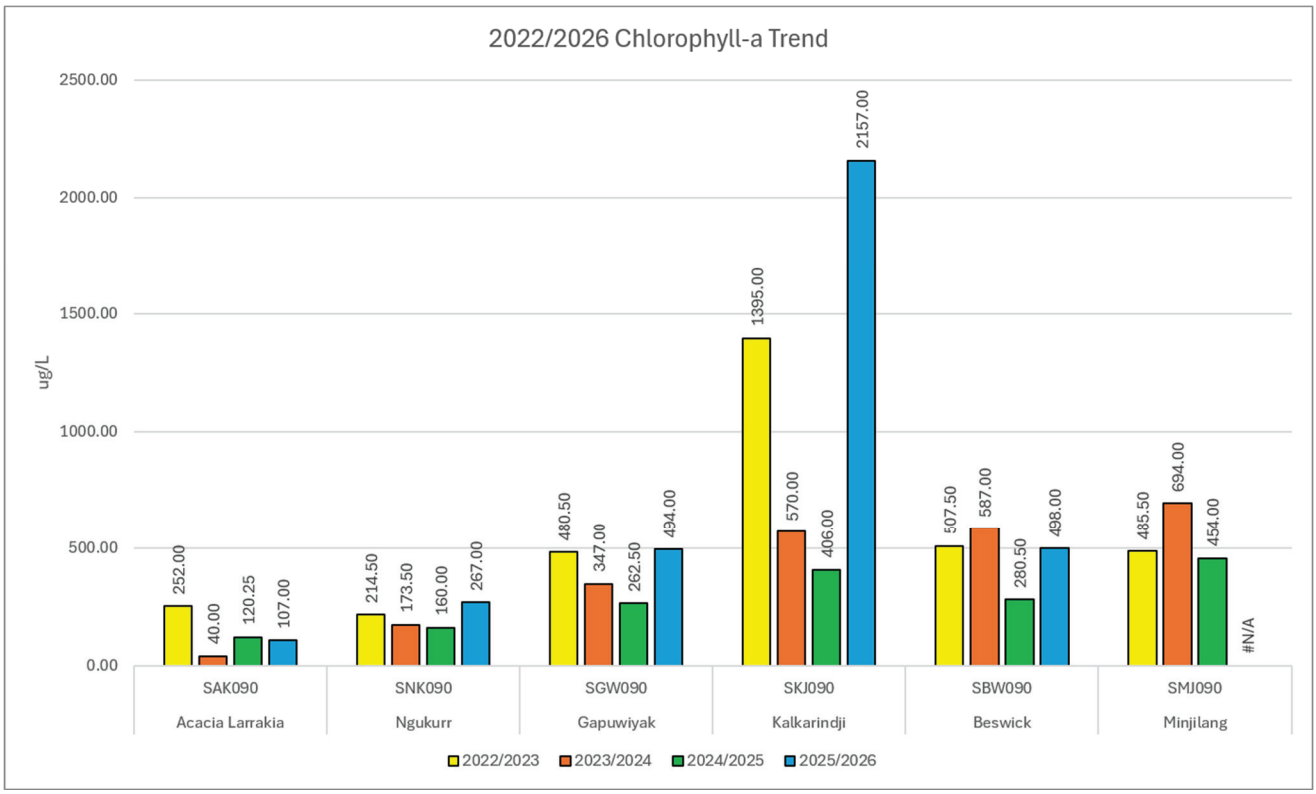

Figure 38. Round 3 Chlorophyll-a Trend

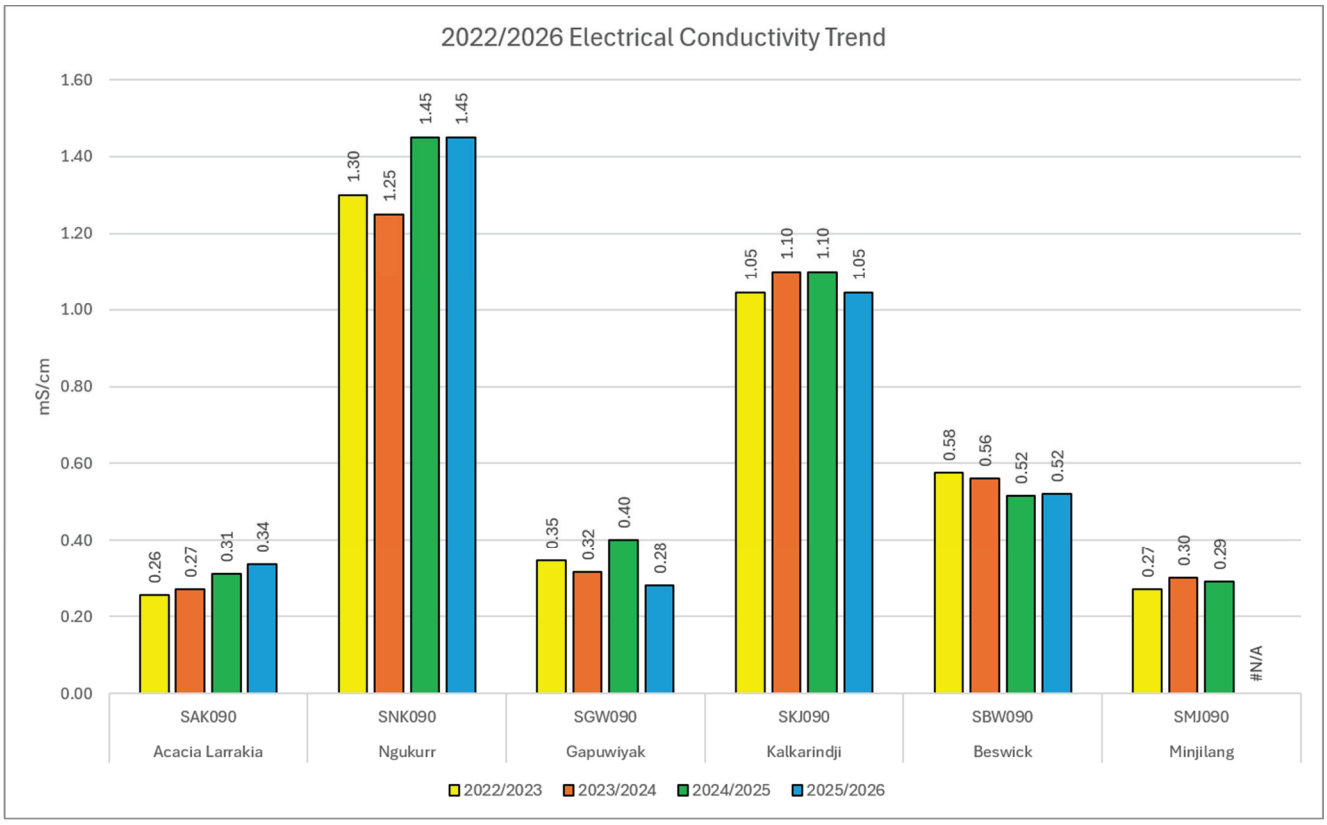

Figure 39. Round 3 Electrical Conductivity Trend

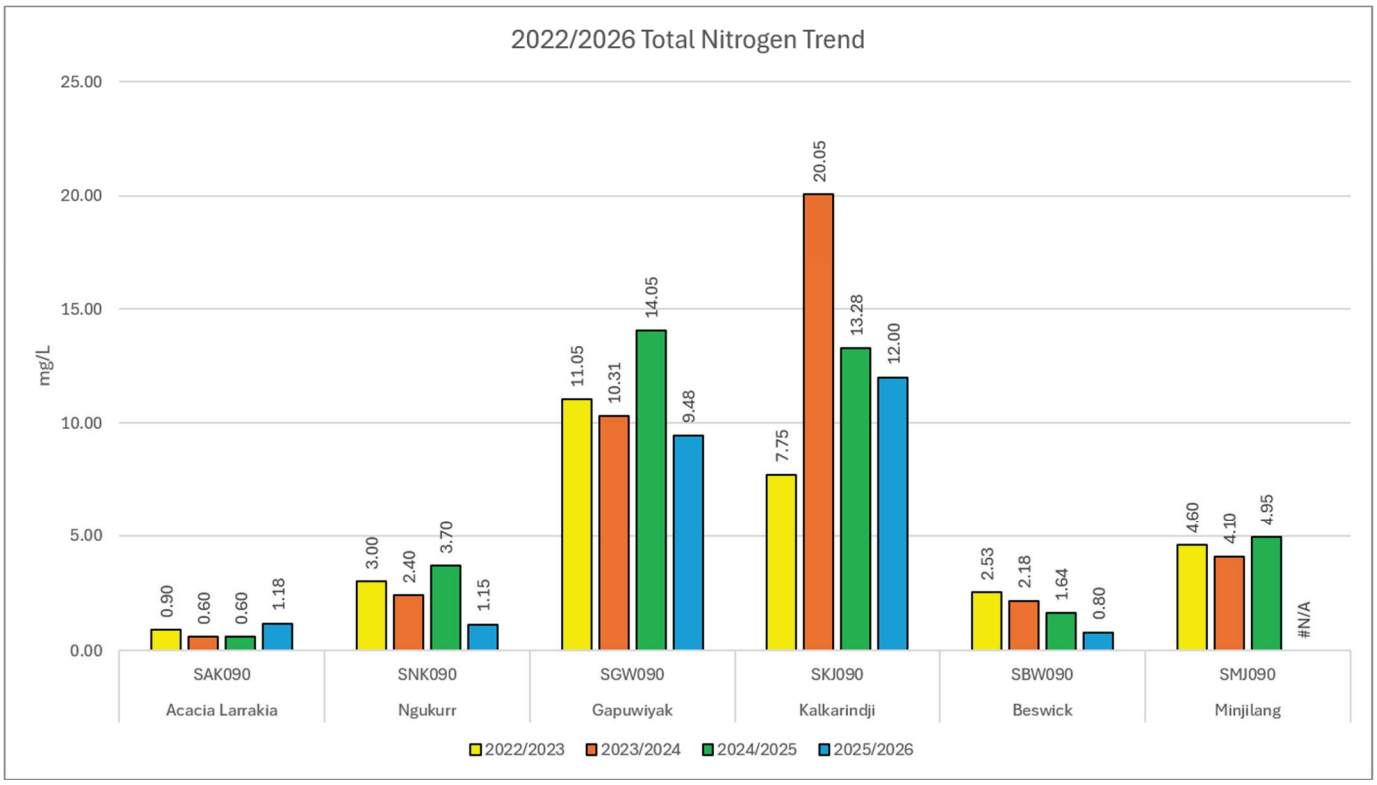

Figure 40. Round 3 Total Nitrogen Trend

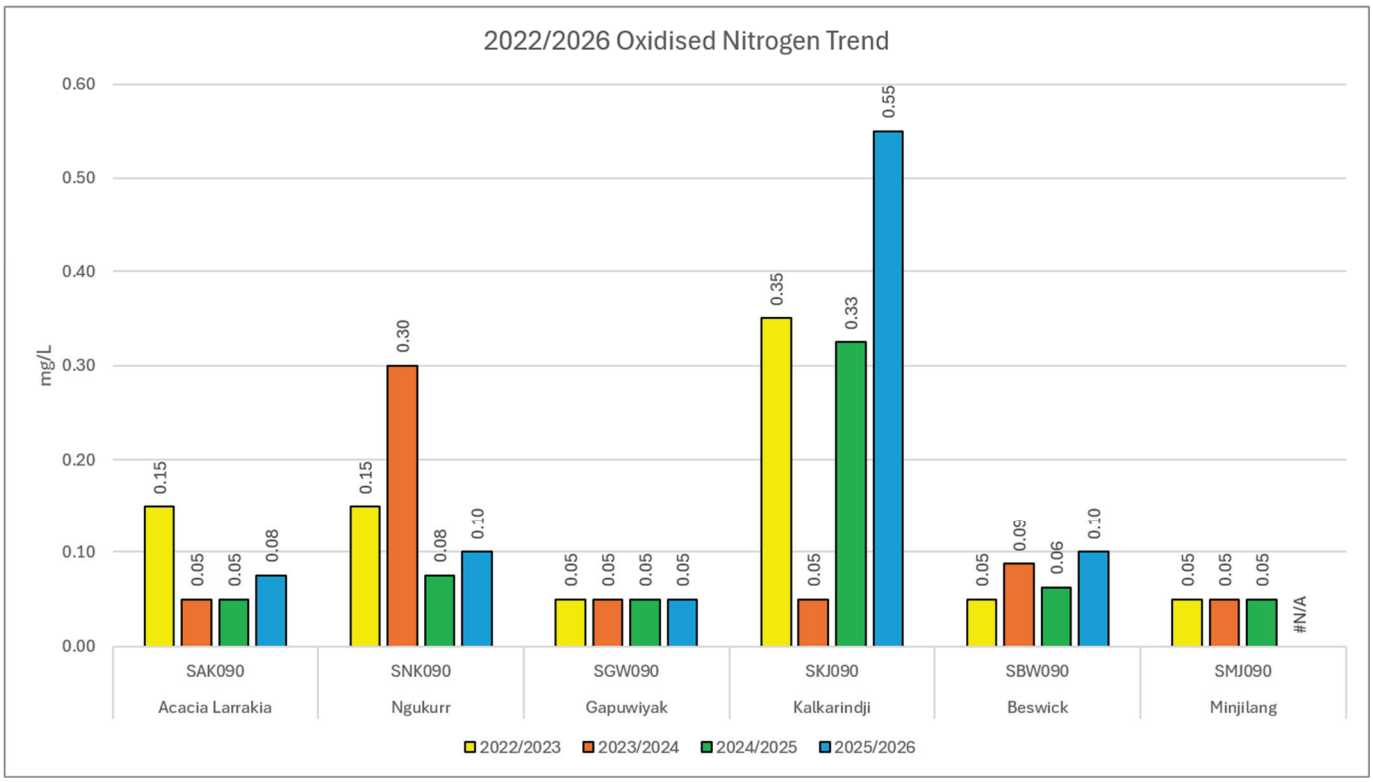

Figure 41. Round 3 Oxidised Nitrogen Trend

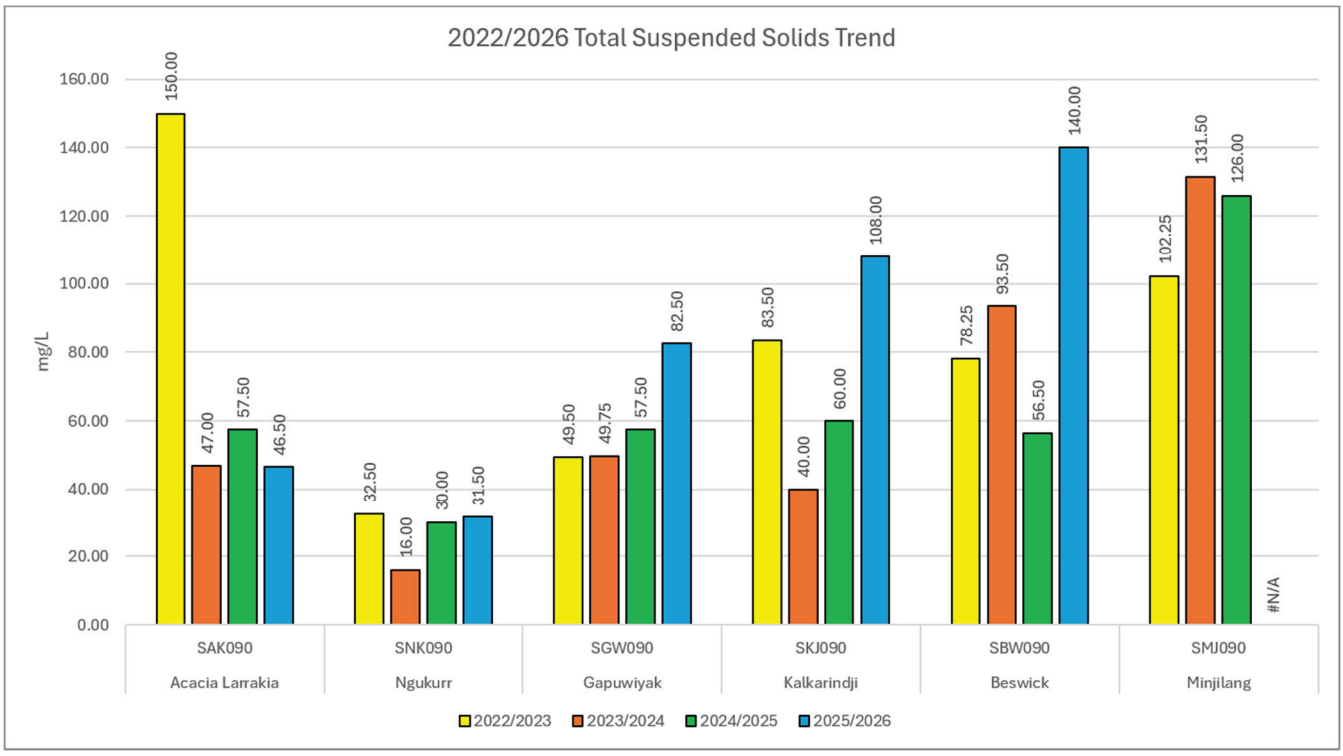

Figure 42. Round 3 Total Suspended Solids Trends

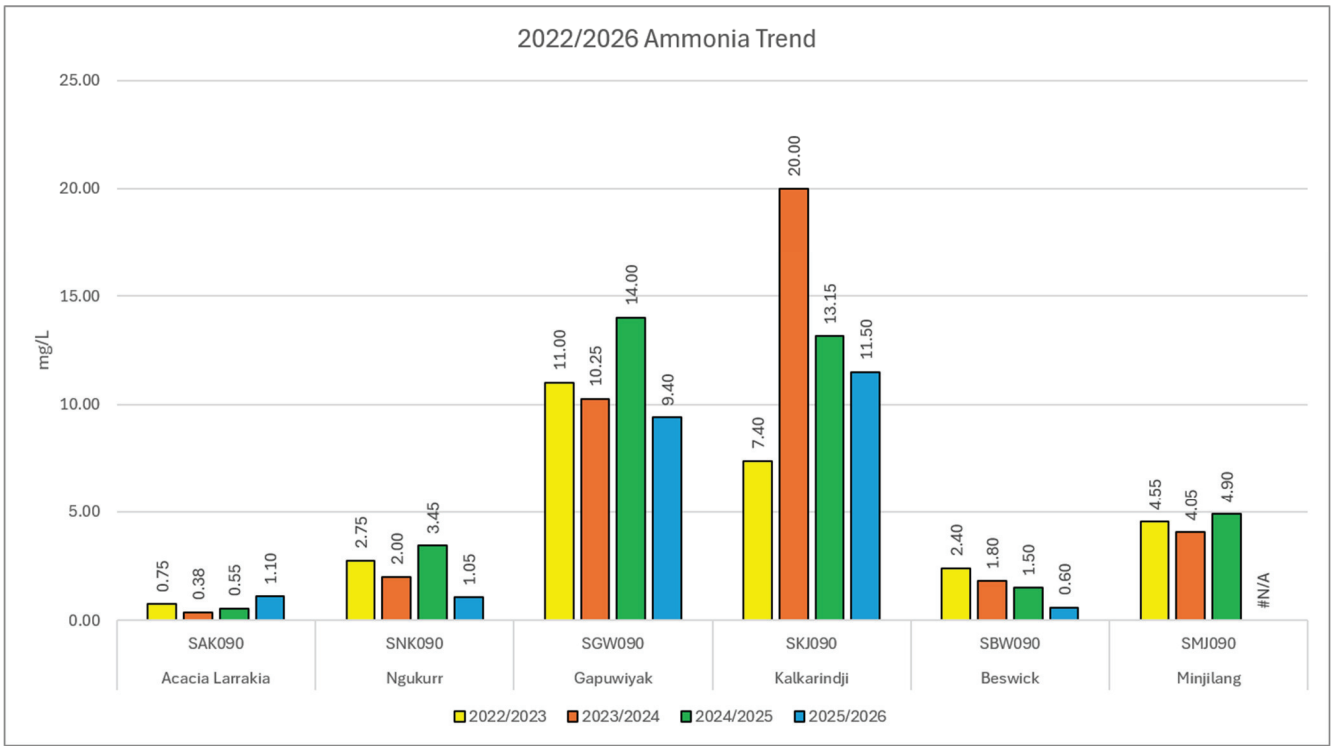

Figure 43. Round 3 Ammonia Trend

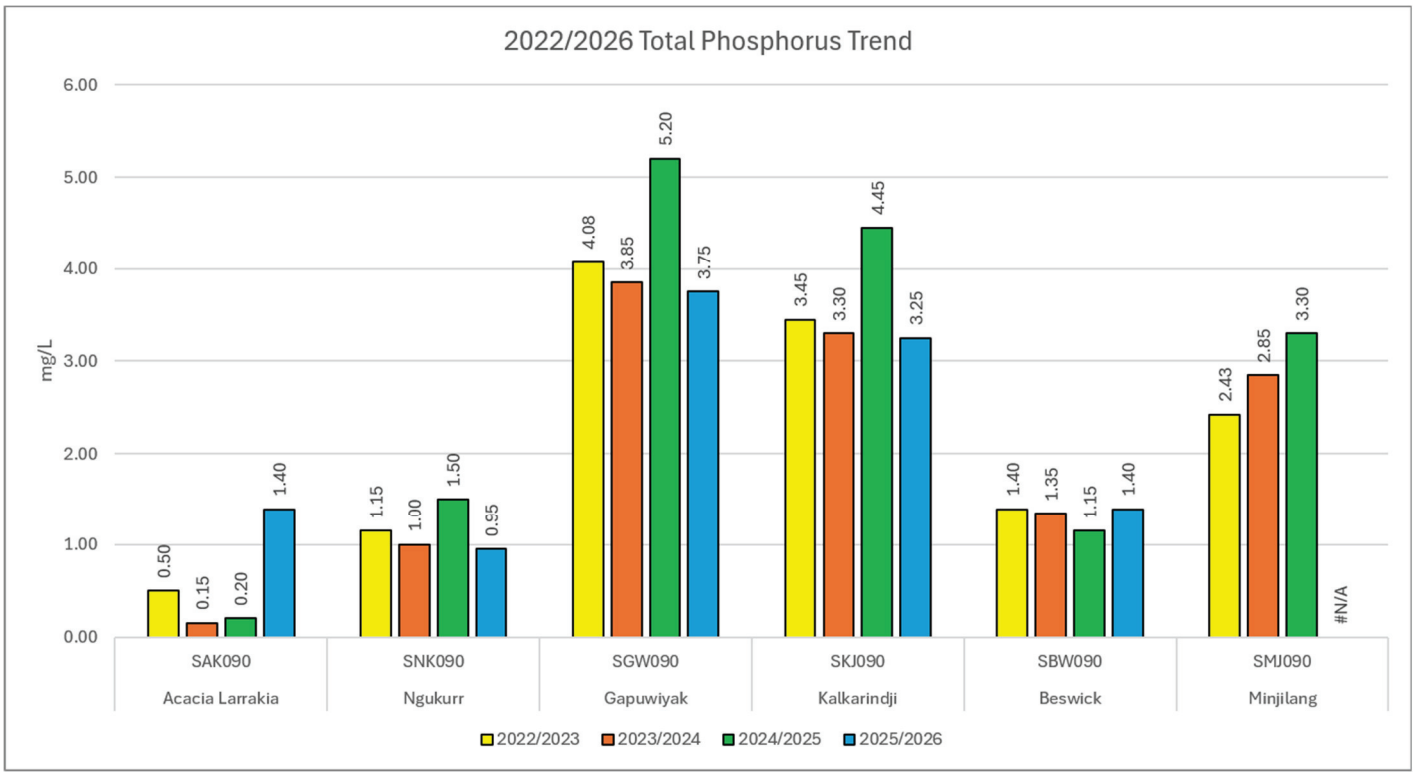

Figure 44. Round 3 Total Phosphorus Trend

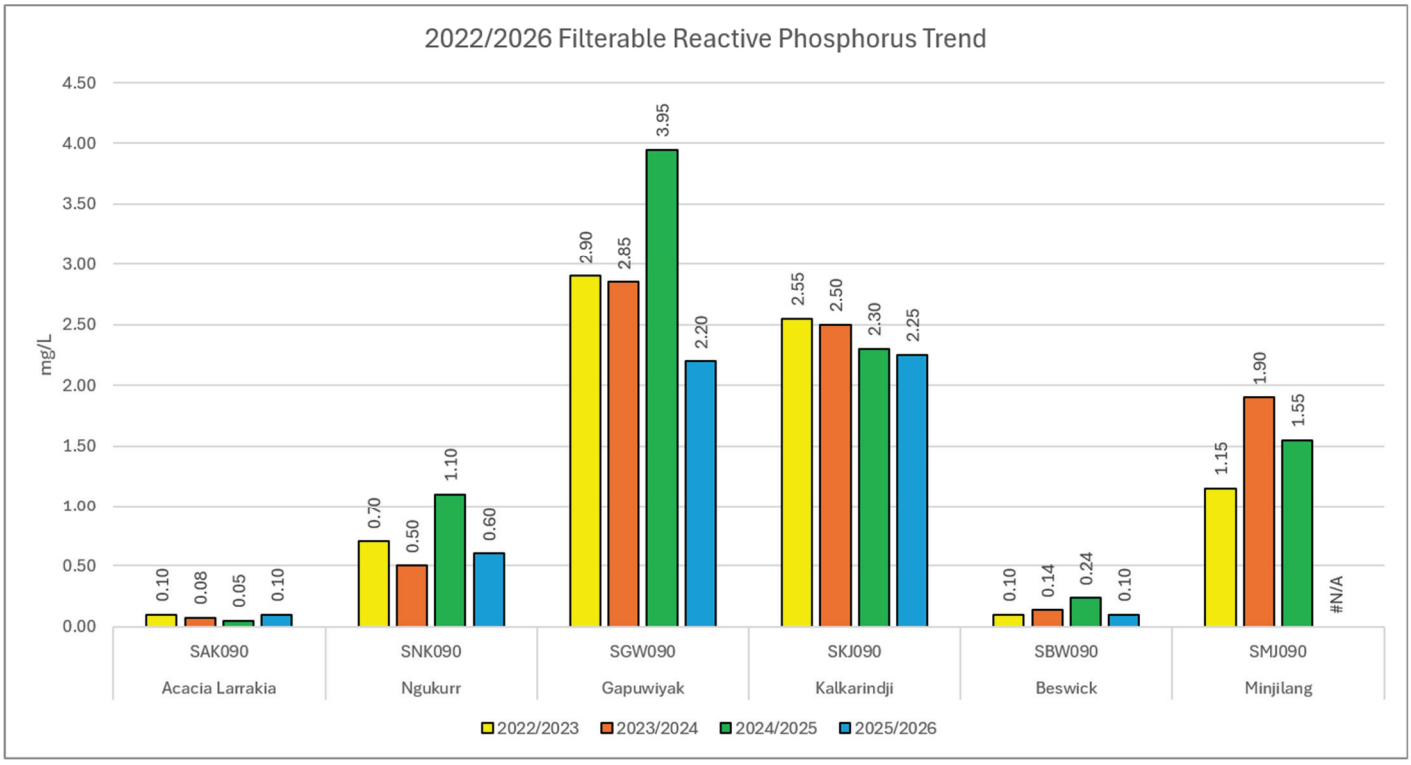

Figure 45. Round 3 Filterable Reactive Phosphorus Trend

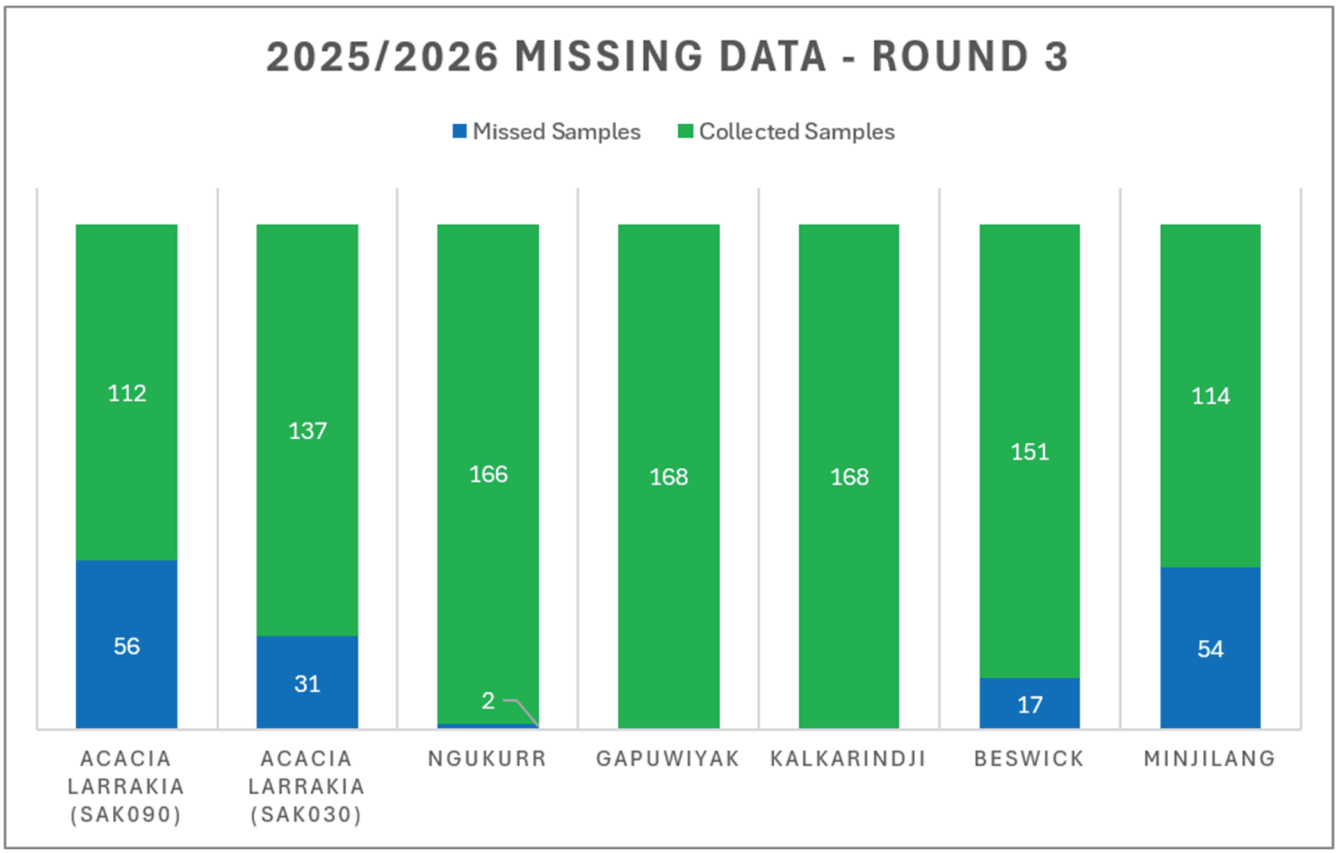

Figure 46. 2025/26 Missing Data - Round 3

Appendix B – List of Remote Communities with WDL

Table 4. List of Remote Communities with Waste Discharge Licences.

Remote Community	WDL	Monitoring Point Site	Licence Expiry
Round 1			
Galiwinku	202	SGA090	11/07/2028
Maningrida	203	SMN090	11/07/2028
Yirrkala	204	SYI090	11/07/2028
Wadeye East	205	SWA090	11/07/2028
Ramingining	206	SRA090	11/07/2028
Nauiyu	207	SNN090	11/07/2028
Milingimbi	208	SML090	11/07/2028
Round 2			
Barunga	214	SBR090	30/05/2034
Belyuen	215	SBLEP01/SBL090	30/05/2034
Gunbalanya	216	SOE090	30/05/2034
Milikapiti	217	SMI090	30/05/2034
Numbulwar	218	SNU090	30/05/2034
Peppimenarti	220	SPE090	30/05/2034
Pirlangimpi	221	SPI090	30/05/2034
Warruwi	222	SWR090	30/05/2034
Wurrumiyanga	223	SNG090	30/05/2034
Round 3			
Acacia Larrakia	225	SAK090	11/12/2031
Beswick (Wugularr)	228	SBW090	11/12/2031
Gapuwiyak	230	SGW090	11/12/2031
Kalkarindji	231	SKJ090	11/12/2031
Minjilang	233	SMJ090	11/12/2031
Ngukurr	234	SNK090	18/12/2031

Appendix C – Tabulation of Monitoring Results – Treated Effluent

Table 5. Remote Community WDL Summary of Data.

POWER AND WATER CORPORATION WDL Monitoring Report – Remote Community WDLs		
Remote Community WDL Summary Data Sheet	Data is extracted from the PWC water quality database for assessment and filed on the PWC records management system. A tabulated summary of all year's wastewater monitoring data for remote community WDLs is completed and provided as Appendix C, attached as a set of three Excel files to the submission of this annual monitoring report.	Internal document numbers D2026/224796 D2026/224799 D2026/224800

Contact

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Water Services

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PowerWater