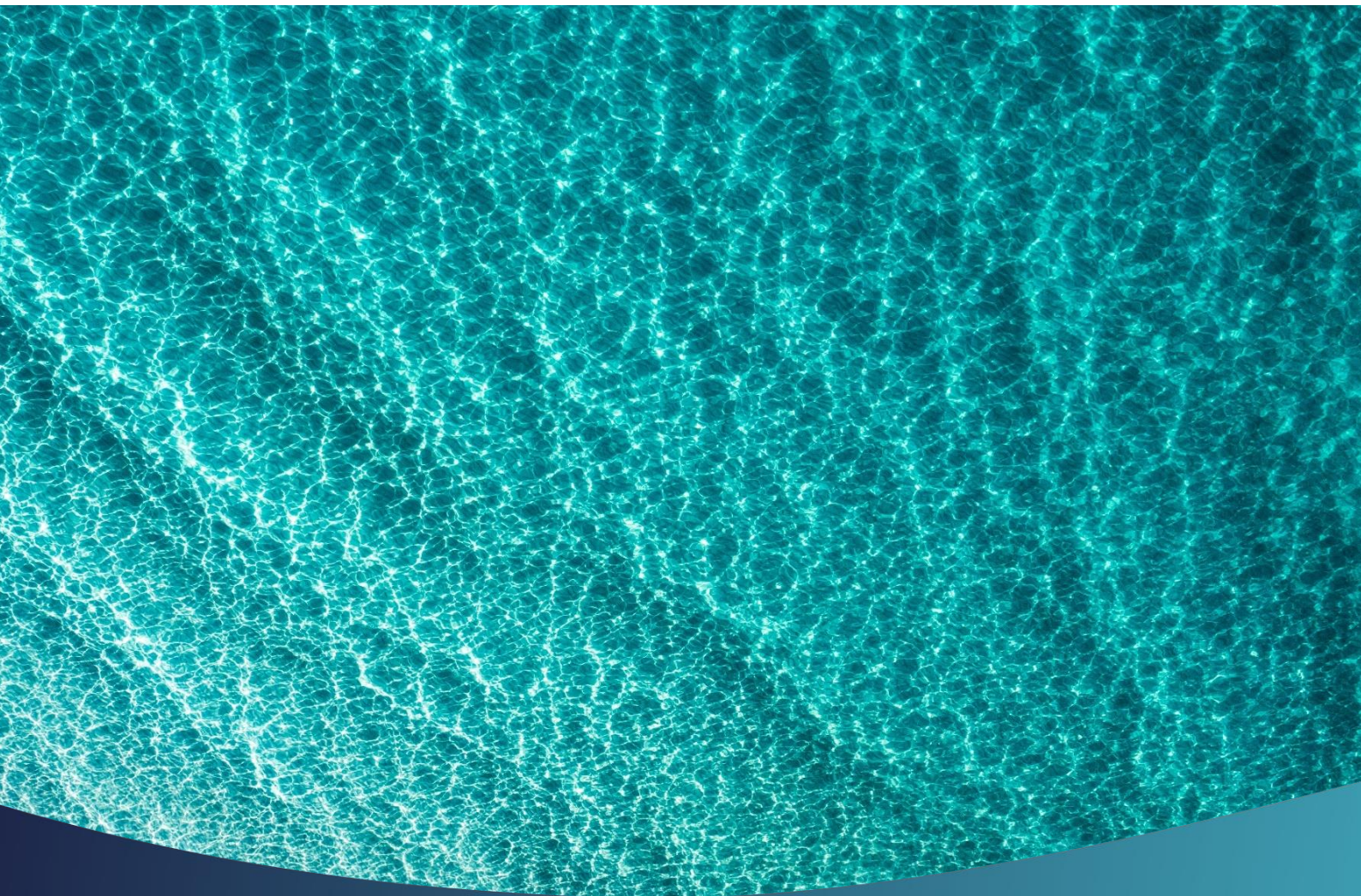


Geraldton Fishing Boat Harbour

2022 Maintenance Dredging – Water Quality Closeout Report



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Executive Summary

In 2022, the Midwest Ports Authority (MWPA) completed a maintenance dredging campaign which was required to reinstate design depths to the entrance channel and commercial harbour due to sedimentation which had reduced draft depths and channel width since the previous campaign in 2012. Maintenance dredging was conducted by Cooper Group of Companies Dredging Contractors between the 10th of September and the 4th of December 2022. Dredging was undertaken by the cutter suction dredge (CSD) Mudlark 1 which completed the following dredging and material placement activities:

- > Removal of 22,291.29 m³ sediments from an area of 28,793.04 m² via cutter suction.
- > Placement of 22,291.29 m³ of dredge material from the inner harbour via pipeline into existing land reclamation area of 21,833 m² north of Berth 7.

To ensure that potential project impacts are adequately managed, a project specific Dredging Environmental Management Plan (DEMP) (O2 Marine 2022a) was developed and implemented throughout the maintenance dredging campaign. The key purpose of the DEMP was to outline the Environmental Protection Outcomes (EPOs) and Management Targets (MTs) associated with the dredging and dredge material placement and outline key management and monitoring requirements to ensure the defined EPOs are achieved.

One of the requirements of the DEMP was to implement a tailwater return monitoring (TRM) program during-, and post-dredging to assess potential impacts and validate marine environmental impact predictions to determine if EPOs have been achieved. Additionally, MWPA implemented a pond water quality monitoring (PWQM) program concurrently to further validate impact predictions and assess any environmental impacts.

This report presents the results from the MEQMP and provides an assessment of the results against the assigned trigger levels to determine whether the Project MTs and EPOs were achieved.

Results from TRM data identified no trigger level exceedances with respect to a decline in receiving marine water pH or Dissolved Oxygen (DO) levels as a result of dredging and tailwater return into the north-eastern corner of the commercial harbour. Issues with the in-situ data logger which caused malfunction and data loss meant the full dredge period and -post-dredge period was not able to be assessed. However, pH and DO levels were typically stable during all recovered sampling periods with no detectable impacts identified from sampling results. The pH and DO levels remained stable at these levels during subsequent post-dredge sampling. This was further validated by data collected by MWPA within the DMPA pond which identified no pH or DO impacts within the Berth 7 DMPA, nor any sign of nutrient or metals which would suggest limited to no acidification of dredge sediments occurred. Therefore, for the purposes of this assessment the MTs and EPOs for the project were considered to have been achieved.

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1. Introduction

1.1. Background

The Port of Geraldton is located approximately 430 km north of Perth in the Mid-West region of Western Australia (**Figure 1**). The Port is administered by the Midwest Ports Authority (MWPA) and presently consists of an entrance channel, a seven berth Commercial Harbour, a large fishing boat harbour, a tug pen and associated land-based infrastructure.

The Midwest Ports Authority (MWPA) are responsible for the ongoing management and environmental performance of the Fishing Boat Harbour (FBH), adjacent Port and Port Waters. MWPA carried out maintenance dredging between 10th of September and the 4th of December 2022, where 22,291.29m³ of accumulated sediments were removed within the FBH entrance and adjacent Lives Beach. Sediments were considered of natural origins and free from contamination and were relocated to the existing Berth 7 dredge material placement area (DMPA). Environmental management requirements for the dredging operation were set out in a Dredge Environmental Management Plan (DEMP) (O2 Marine 2022a), which defined environmental quality trigger levels to facilitate assessment of project Management Targets (MTs) and Environmental Protection Outcomes (EPOs). Included in the DEMP was the requirement to undertake monitoring of Marine Environmental Quality during and post-completion of the dredging operations.

1.2. Project Description

Maintenance dredging was conducted by Cooper Group of Companies Dredging Contractors between the 10th of September and the 4th of December. Dredging was completed by the cutter suction dredge (CSD) Mudlark 1 (**Figure 2**) which has the following specifications:

- > Displacement: 48 tonnes
- > Hull Length: 18 m
- > Breadth: 5 m
- > Pump: Warman 250mm high head dredge pump.
- > Draft: 900mm

1.2.1. Dredge Program

Dredging works were completed over 84 days, commencing 10th of September 2022 to completion on 4th of December 2022. Dredging works were typically undertaken 6 days per week (Monday to Saturday). Several significant delays to dredging occurred due to breakdowns and damage to the dredging equipment. A summary of the programme is shown in **Table 1**.

The following significant delays (>2 days) occurred during the dredging works:

- 12 September - 15 September (2.5 days): combined sea state delay and repairs (crack in the auxiliary spud carriage)
- 22 September - 11 October (19 days):

- Snapped spud wires, awaiting divers to retrieve (5 days).
- While awaiting divers, both the main and auxiliary spuds were stuck in the seabed without the ability to lift either spud, causing significant damage to the auxiliary spud and spud carriage. In attempting to release the spuds, the auxiliary spud was snapped off with the top 6m retrieved and the remaining 4m left below the seabed. Dredge retrieved to hardstand, various repairs and maintenance undertaken. Dredge modified to operate on a single (main) spud only (14 days).
- 29 October – 1 November (3 days): standby due to poor sea state.

Table 1: 2022 Dredging Program

Date	Item
8-12 August 2022	Early works to prepare the Berth 7 reclamation
24-27 August 2022	Pre-dredge survey, including setup and calibration
22 August 2022	Mobilisation commenced
10 September 2022	Dredging commenced
4 December 2022	Dredging complete
7 December 2022	Demobilisation of dredging equipment complete
7-9 December 2022	Post-dredge survey, including setup and calibration
16 December 2022	Reclamation area works (capping) complete

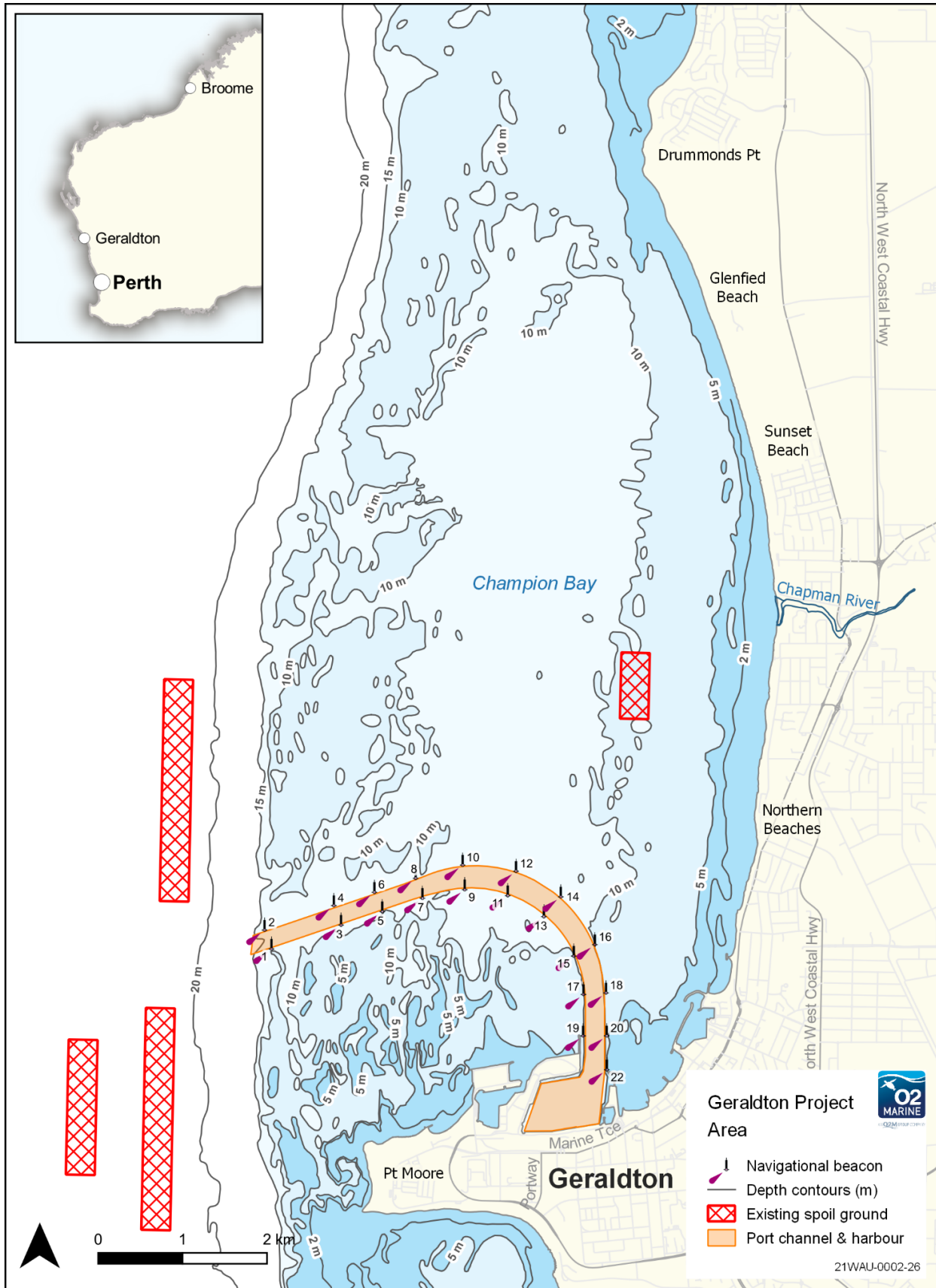


Figure 1: Geraldton Port regional context



Figure 2: Cutter Suction Dredge Mudlark 1

A summary of project and operational activities conducted are presented in **Table 2** and **Table 3**.

Table 2: Summary of the Project

Project Title	Geraldton Fishing Boat Harbour 2022 Maintenance Dredging Project
Proponent Name	Midwest Ports Authority
Short Description	Maintenance dredging of accumulated sediments within the FBH entrance and adjacent Lives Beach removed a volume of 22,291.29m ³ . Sediments are considered of natural origins and free from contamination and were relocated to the existing Berth 7 DMPA.

Table 3: Location and Proposed extent of operational elements

Element	Location	Project Extent
Maintenance dredging of accumulated FBH entrance and Lives Beach sediments	Figure 3	Removal of 22,291.29m ³ of sediments from a dredge footprint area of 28,793.04 m ² via cutter suction dredge.
Land reclamation within existing Berth 7 DMPA	Figure 3	Placement of 22,291.29 m ³ of dredge material into existing land reclamation cell north of Berth 7.

1.3. Objectives

The specific objective of this report is to present a summary of the results from the marine water quality sampling monitoring requirements within the DEMP and an assessment against the defined trigger levels to ascertain whether the Project Management Targets (MT) and Environmental Protection Outcomes (EPO) have been achieved.

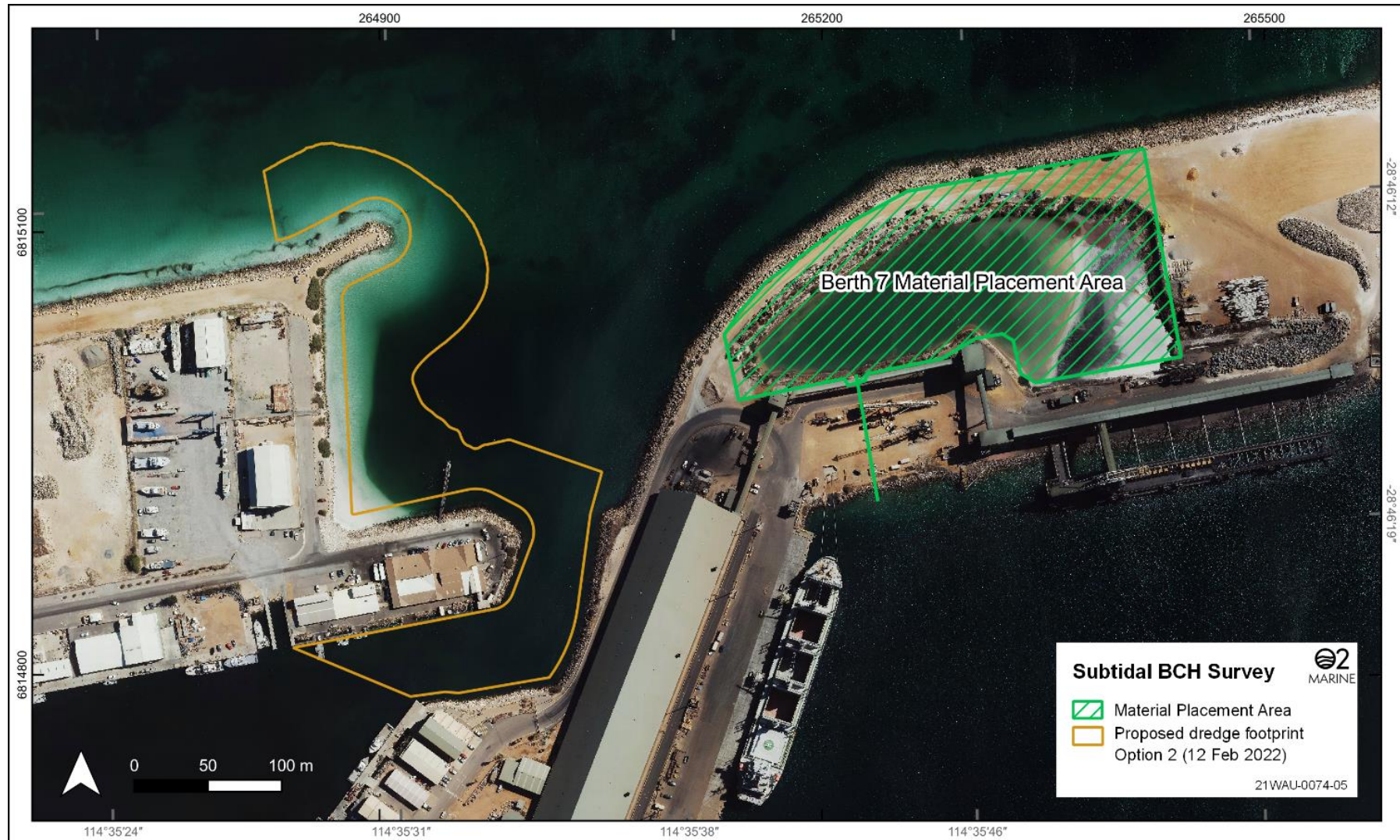


Figure 3: Proposed dredging and relocation footprints

2. Dredge Environmental Management Plan

2.1. Overview

During planning for the maintenance dredging works MWPA commissioned an Environmental Impact Assessment (EIA) to ensure that potential project impacts are adequately identified and assessed (Wavelength/O2Marine 2022a). The EIA identified potential impacts and management of the impacts which were subsequently incorporated into a project specific Dredging Environmental Management Plan (DEMP) (O2 Marine 2022a). The key purpose of the DEMP was to outline the EPOs and MTs associated with the dredging and dredge material placement undertaken for the maintenance dredging project. Detailed management actions and monitoring programs were included to ensure that the project EPOs were achieved.

The Marine Environmental Quality Monitoring Program (MEQMP) was developed and implemented to validate the impact assessment and sediment characterisation conclusions that the removal and land reclamation of harbour sediments have a low potential for risk to marine environmental quality. Under the DEMP the MEQMP comprised of a tailwater return monitoring (TRM) program, in addition MWPA also implemented a DMPA pond water quality monitoring (PWQM) program to provide additional assessment for potential environmental impact. The MEQMP was conducted during-, and post-dredging, to assess potential impacts and validate marine environmental impact predictions to determine if EPOs have been achieved.

2.2. Predicted Environmental Protection Outcomes

To ensure that marine environmental quality was not impacted by dredging and material placement activities, spatial levels of ecological protection were defined within the DEMP and are presented in **Figure 4**. The specific EPOs and MTs for the protection of marine environmental quality are summarised in **Table 4**.

Table 4: Environmental Protection Outcomes, Management Targets, and potential environmental impact pathways

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome	Management Target
Marine Environmental Quality	To maintain the quality of water, sediment and biota so that environmental values are protected.	Disturbance of existing contaminants in groundwater and soils within the Berth 7 DMPA sediments during sediment relocation and return water discharge has the potential to deteriorate water quality and contaminate marine organisms.	No residual impacts on marine environmental quality as a result of the dredging or tailwater return activities.	A 'Low Level of Ecological Protection' shall be maintained at point of dredge return water discharge as spatially defined in Figure 3 and will return to a 'Moderate Level of Ecological Protection' within one month following cessation of discharge.
		Disturbance of existing nutrients in groundwater and soils within the Berth 7 DMPA sediments during sediment relocation and return water discharge has the potential to deteriorate water quality.		
		Hydrocarbon release into the marine or terrestrial environment from a hydrocarbon spill and or bunkering operations.		Manage refuelling, chemical storage and spill response to ensure no adverse impacts to the marine environment.

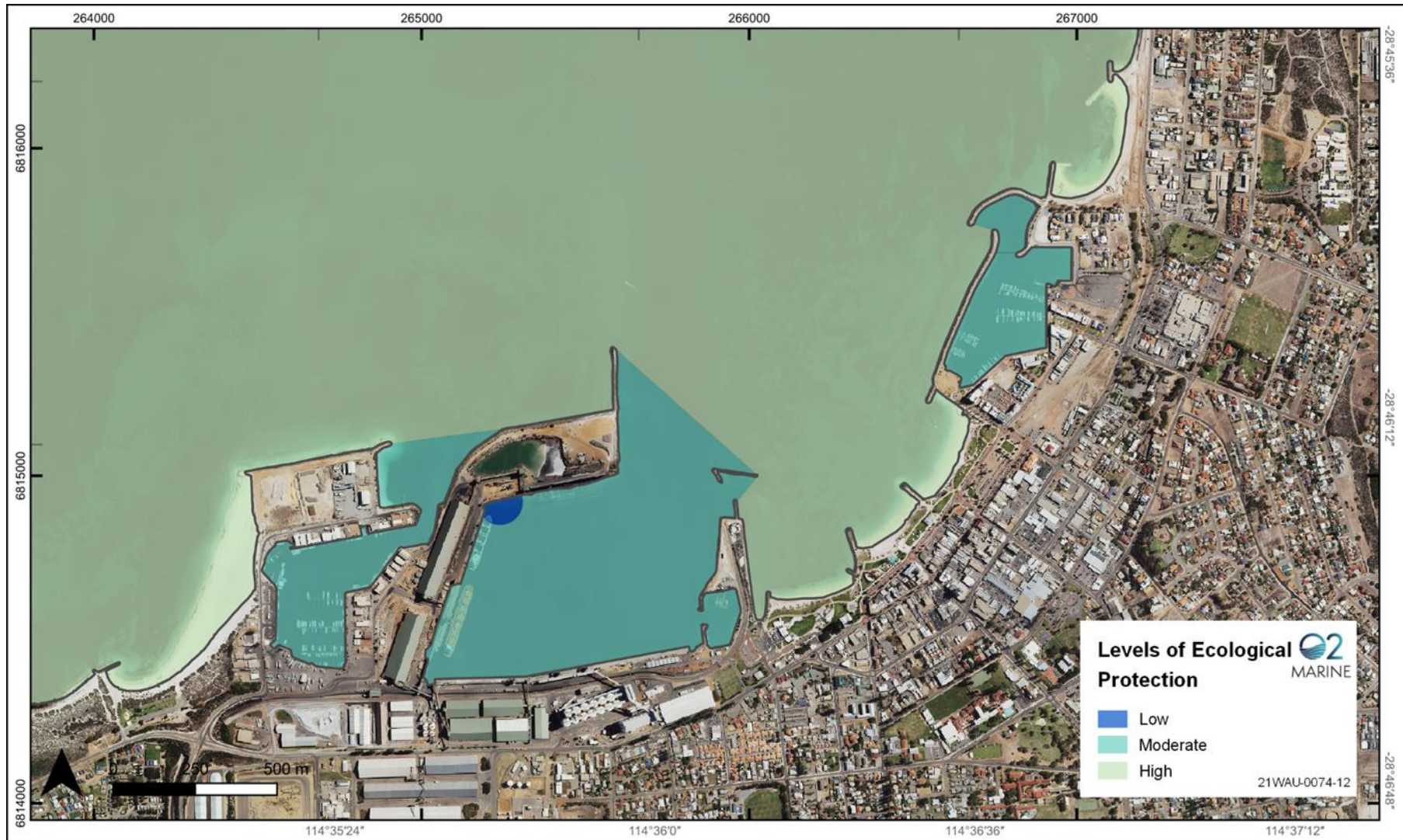


Figure 4: Spatial levels of ecological protection for the Port of Geraldton and surrounding waters

2.3. Marine Environmental Quality Trigger Levels

The DEMP presented trigger levels for assessment of the tailwater return monitoring data as applicable to achieve the project specific Environmental Protection Outcome (EPOs) and Management Target (MTs) These are outlined in **Table 5**. It should be noted that PWQM conducted by MWPA was not a requirement of the DEMP and therefore no specific trigger levels were developed for assessment of this data.

Table 5: Trigger Levels for tailwater return monitoring

Monitoring Location: WQD1	
<u>Management Target:</u> Moderate Level of Ecological Protection	Trigger Level 1 – Daily averages over two consecutive sampling dates
	pH: <6.0 DO: < 60% saturation
<u>Environmental Protection Outcome:</u> Moderate Level of Ecological Protection achieved after one month post dredging	Trigger Level 2 – Daily averages for final week of post dredge sampling period
	pH: < 7.0 DO: < 70% saturation

3. Methods

Monitoring conducted as summarised within this report include:

TRM Program:

- In-situ data logging for:
 - pH; and
 - dissolved oxygen (DO).

PWQM program:

- Physicochemical sampling:
 - pH;
 - temperature;
 - DO; and
 - total dissolved solids (TDS).
- Water sample collection and laboratory analysis:
 - Metals;
 - Nutrients;
 - TDS; and
 - Total suspended solids (TSS).

An overview of the methods applied for each sampling program is presented in the following sections.

3.1. Monitoring Locations and Frequency

3.1.1. Tailwater Return Monitoring

In-situ water quality logging for physicochemical parameters was conducted in accordance with the methods outlined within the DEMP. This required hourly sampling for each parameter for the duration of dredging and for a one-month post-dredge period. Data logging was proposed to be conducted at site WQD1 (Figure 5), however this site was re-located due to safety issues associated with the logger being deployed within shipping and tug operational areas. The final as-deployed was under Berth 6 on the boundary of the low ecological protection area (LEPA) and moderate ecological protection area (MEPA) where shipping and tug wash would not disturb the readings.

The logger was initially deployed on the 9th of September 2022, just prior to dredging which commenced on the 10th of September 2022. Due to a logger malfunction which resulted in power loss to the unit, data was only recorded until the 20th of September 2022. No further data was obtained during the dredge period which ceased on the 4th of December 2022. This logger was recovered on the 22nd of December 2022 so data from the first 18 days of the post-dredge period were also not recovered based on the logger malfunction. Data for the post-dredge period was therefore captured from the 22nd of December up until the recovery date of 11th January 2023. A summary of *in-situ* sampling activities is presented in Table 6.

Table 6: In-situ sampling summary

Date	Activity Summary
9/09/2022	Logger deployed prior to dredge commencing
10/09/2022	Dredging commenced
20/09/2022	Power lost; Logger stopped recording
04/12/2022	Dredging complete
22/12/2022	Logger retrieved and replacement logger redeployed
11/01/2023	Logger retrieved

3.1.2. DMPA Pond Water Quality Monitoring

PWQM, as conducted by MWPA included, water sample collection and physicochemical profiling during and post dredging as summarised in **Table 7**. PWQM was conducted at two sites as presented in **Figure 6**.

Table 7: Pond water quality monitoring program sampling and analysis summary

Dredge Period	Date	Analysis				
		Physicochemical Parameters	Metals	TDS	TSS	Nutrients
During - Dredge	13/09/2022	-	X	X	X	X
	19/09/2022	X	X	X	X	X
	27/09/2022	X	X	-	X	X
	19/10/2022	X	X	X	X	X
	26/10/2022	X	X	X	X	X
	14/11/2022	X	X	X	X	X
	29/11/2022	X	X	X	X	X
	5/12/2022	X	-	X	-	-
Post - Dredge	19/12/2022	X	X	X	X	X

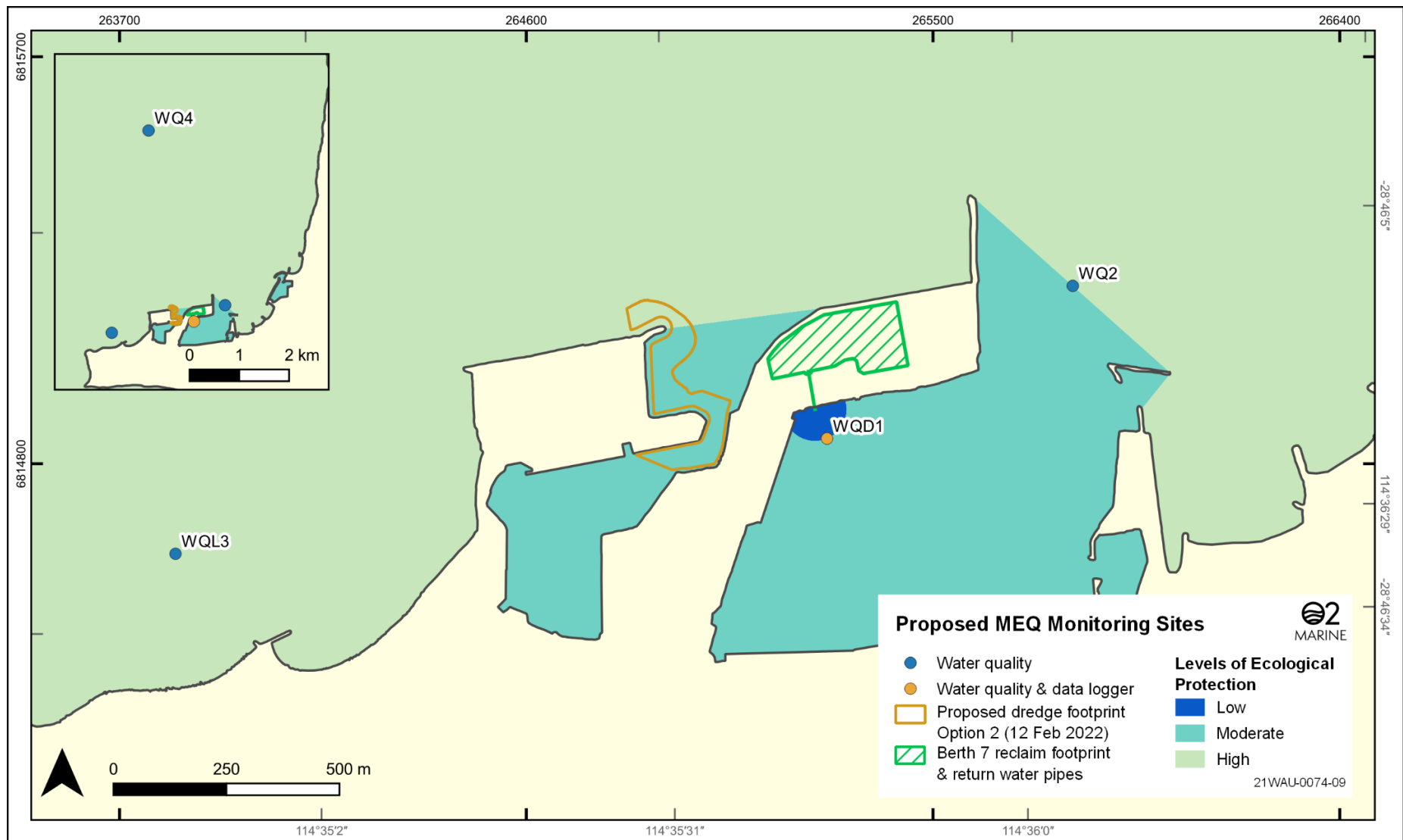


Figure 5: In-Situ monitoring and reactive water sampling locations



Figure 6: Field Physiochemical and Pond Water Quality Sampling Locations

3.2. Laboratory Analysis

All water quality samples collected under the PWQM program were analysed by Eurofins/ARL. Eurofins/ARL are accredited (Accreditation number 2377 and 2561) by the National Association of Testing Authorities (NATA). Laboratory QA/QC requirements were in place during all analytical testing in accordance with the laboratories NATA accreditation. Laboratory reports and QAQC results are presented in **Appendix A**.

3.3. Data Analysis

3.3.1. Tailwater Return Monitoring

Raw hourly physicochemical parameter data were analysed to produce timeseries graphs of each parameter. Post processing of the data included removal of outlier data points, post calibration correction based on post deployment calibration drift as required and data smoothing through application of a rolling average for pH.

pH and DO concentrations were then assessed against the trigger levels (**Table 5**) to determine if the MTs of the DEMP were achieved and therefore the EQOs met.

3.3.2. DMPA Pond Water Quality Monitoring

3.3.2.1. Field Physiochemical Data Collection

The value of each single point physiochemical measurement was assessed against the tailwater return trigger levels presented in **Table 5** as an additional level of assessment, though it must be noted that any exceedance of the trigger level would not require management action base on there being no dilutions occurring as at the LEPA/MEPA boundary where the trigger levels were established for.

3.3.2.2. Water Sample Collection

Laboratory reported water toxicant results were compared to the ANZG (2018) 90% species protection levels (SPLs), where available, to conservatively assess the water quality within the Berth 7 DMPA. Nutrients were compared to the 80th percentile default guideline values (DGVs) for the IMCRA Mesoscale Central West region. The SPLs and DGVs are presented in **Table 9**. There were no defined MTs or EPOs for metals and nutrient contaminants within the DEMP for water samples collected in the Berth 7 DMPA.

4. Results and Discussion

4.1. Tailwater Return Monitoring

4.1.1. During – Dredge results

4.1.1.1. Dissolved Oxygen

DO data recovered from the pre-dredge period is displayed in **Figure 7**. Assessment of data indicated no exceedances of any trigger levels for DO, which typically remained above 97% saturation, ranging between 96.9-108.4% saturation, indicating a very well oxygenated water column.

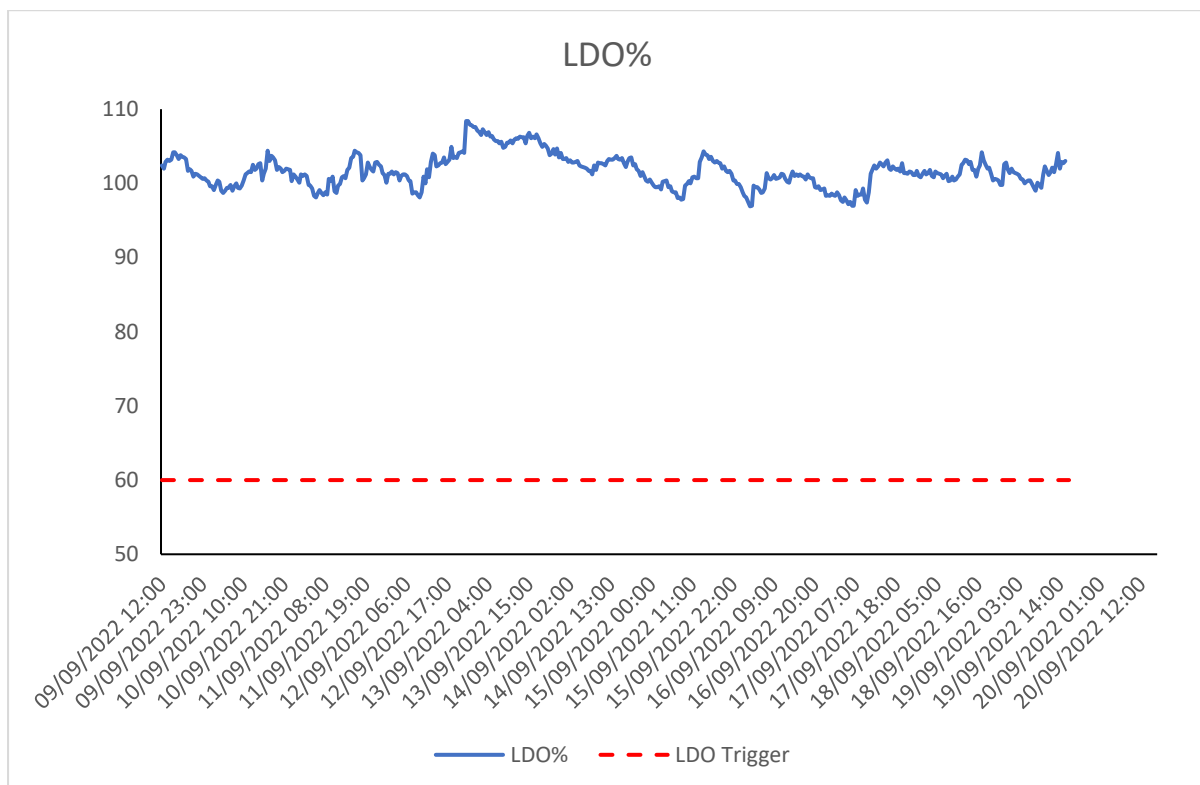


Figure 7: DO results for the pre-dredging sample period.

4.1.1.2. pH

pH data recovered from the pre-dredge period is displayed in **Figure 8**. Assessment of data indicated no exceedances of any trigger levels for pH with concentrations remaining between 8.16 to 8.24.

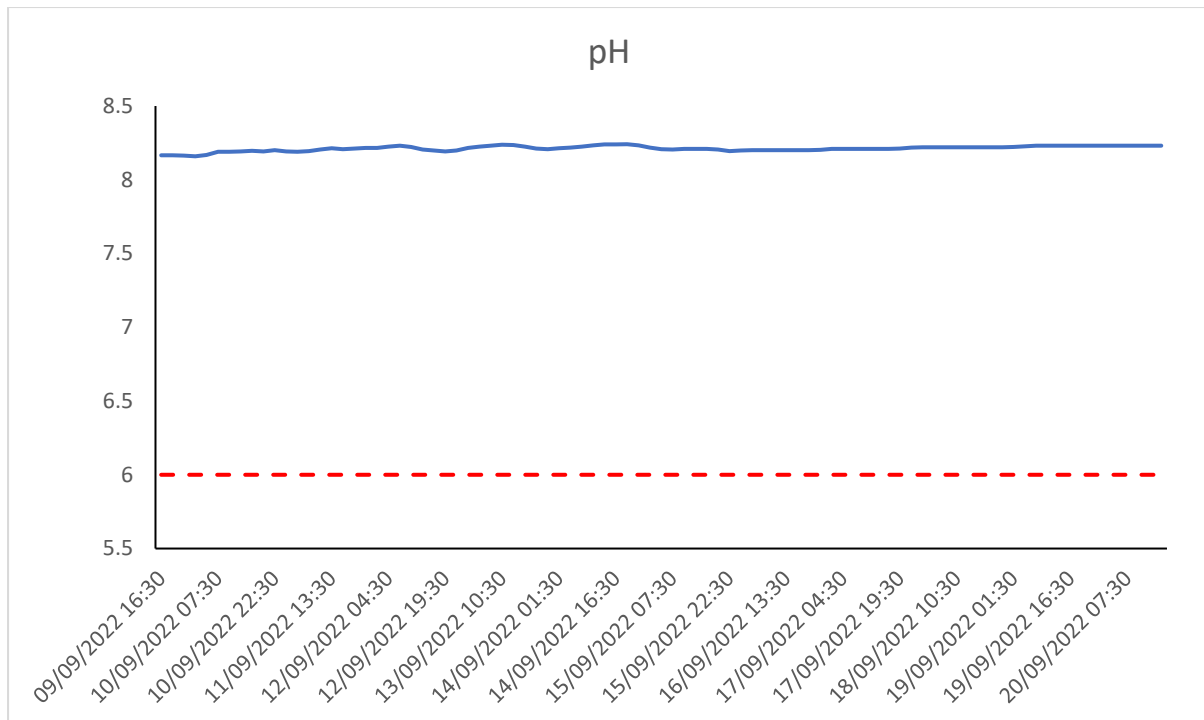


Figure 8: pH results for the pre-dredging sample period

4.1.2. Post – Dredge MEQMP survey results

4.1.2.1. Dissolved Oxygen (DO)

DO data recovered from the post-dredge period is displayed in **Figure 9**. Assessment of data indicated no exceedances of the trigger level for DO, which remained between 87.4-107.8% saturation, indicating a very well oxygenated water column. Results did not significantly differ from those reported from the during-dredge sample period.

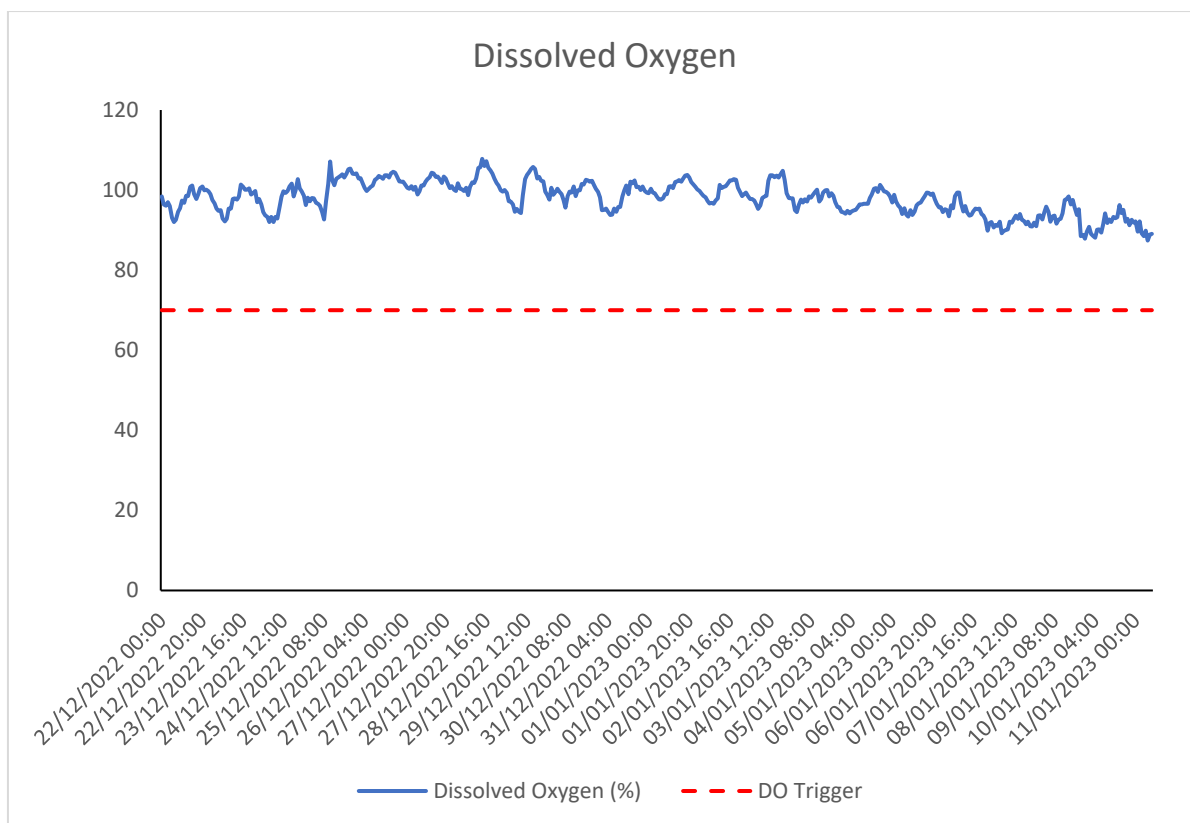


Figure 9: DO results for the post-dredging sample period

4.1.2.2. pH

pH data recovered from the post-dredge period is displayed in **Figure 10**. Assessment of data indicated no exceedances of the trigger level for pH with all values reported between 8.13 and 8.23. Results did not significantly differ from those reported from the during-dredge sample period.

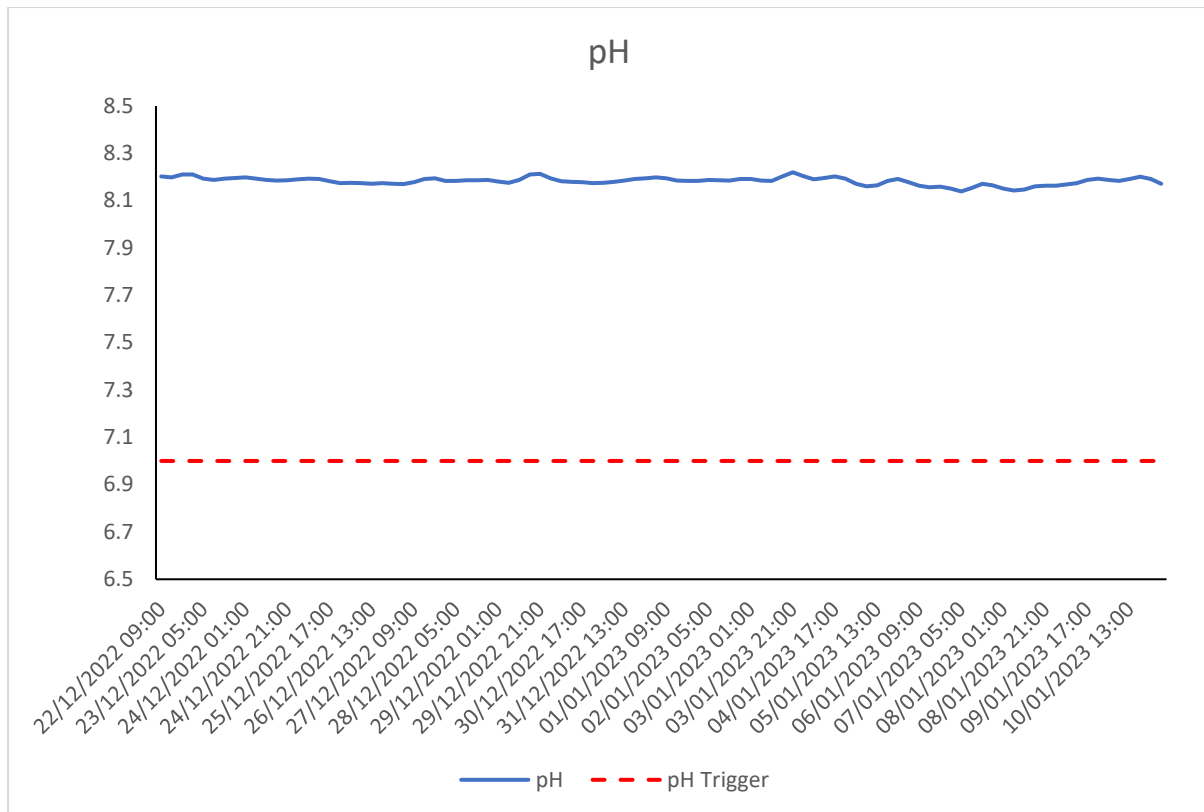


Figure 10: pH results for the post-dredging sample period

4.2. DMPA Pond Water Quality Monitoring

4.2.1. Field Physicochemical Data

A summary of the field physiochemical data is presented in **Table 8**. pH concentrations remained above the trigger levels throughout the sampling period. Temperature was observed to steadily increase in the DMPA throughout the sampling period at both sampling locations.

4.2.2. Pond Water Quality Samples

Results from water sample analysis from the Berth 7 DMPA sites MWPA-N and MWPA-S are presented in **Table 9** (metals) and **Table 10** (nutrients and solids).

Results from metals analysis identified two exceedances of the 90% SPL for copper, both detected during -dredging. No other elevated results were observed. Nutrient results were generally low and comparable between the two sites. TN was observed to be elevated on the 19th of September 2022 (both sites and 19th of October 2022 (one site), whilst ammonia was elevated on the 27th of September 2022 (both sites) and 19th of October 2022 (one site). Variations in nutrient levels during dredging is not uncommon and likely because of the dredge moving through areas of marine sediment that contained a high organic content. TSS was highly variable between sites, and between sampling events ranging from below the laboratory detection level up to 25 mg/L, whilst TDS was quite stable throughout the sampling period.

Table 8: Field Physiochemical Sampling results within Berth 7 DMPA

Date	South Sampling Point (MWPA-S)				North Sampling Point (MWPA-N)			
	pH	Temp °C	TDS g/L	DO mg/L	pH	Temp °C	TDS g/L	DO mg/L
Trigger Level	< 7	-	-	-	< 7	-	-	-
19/09/2022	7.81	17.90	33.2	7.22	7.85	18.11	33.3	4.28
27/09/2022	8.25	20.68	32.2	-	8.17	21.15	30.6	-
19/10/2022	7.88	20.63	33.3	8.03	7.92	20.95	33.4	6.64
26/10/2022	8.17	20.77	31.6	6.17	8.11	20.86	32.8	7.26
14/11/2022	8.00	21.25	34.1	5.04	7.93	21.13	34.0	5.46
29/11/2022	7.70	23.61	33.5	6.37	7.70	23.36	33.2	5.93
5/12/2022	7.85	23.80	33.6	6.08	7.79	24.24	33.9	9.15
19/12/2022	8.07	25.82	34.1	4.42	7.80	26.26	34.3	3.21

Table 9: Metal and metalloid concentrations during and post dredging in Berth 7 DMPA

Date	Site ID	Metals and Metalloids (mg/L)									
		As	Cr	Pb	Mo	Ni	Cu	Cd	Al	Se	Zn
	90% SPL	-	0.049	0.0066	-	0.2	0.003	1.4	-	-	0.023
13/09/22	MWPA-N	0.003	<0.001	<0.001	0.012	<0.001	<0.001	<0.0001	<0.05	0.004	<0.005
	MWPA-S	0.003	<0.001	<0.001	0.013	<0.001	<0.001	<0.0001	<0.05	0.004	<0.005
19/09/22	MWPA-N	0.006	<0.001	<0.001	0.013	<0.001	<0.001	<0.0001	<0.05	0.004	<0.005
	MWPA-S	0.006	<0.001	<0.001	0.013	<0.001	<0.001	<0.0001	<0.05	0.003	0.006
27/09/23	MWPA-N	0.007	<0.001	0.001	0.013	<0.001	0.012	0.0001	<0.05	0.002	0.007
	MWPA-S	0.006	<0.001	<0.001	0.013	<0.001	0.011	<0.0001	<0.05	<0.001	0.008
19/10/23	MWPA-N	0.009	<0.001	<0.001	0.014	<0.001	<0.001	<0.0001	<0.05	<0.001	<0.005
	MWPA-S	0.009	<0.001	<0.001	0.014	<0.001	<0.001	<0.0001	<0.05	<0.001	<0.005
26/10/22	MWPA-N	0.005	<0.001	<0.001	0.018	<0.001	<0.001	<0.0001	<0.05	0.003	<0.005
	MWPA-S	0.006	<0.001	<0.001	0.018	<0.001	<0.001	<0.0001	<0.05	0.003	<0.005
19/12/22	MWPA-N	0.007	<0.001	<0.001	0.014	<0.001	0.001	<0.0001	0.08	0.002	<0.005
	MWPA-S	0.007	<0.001	<0.001	0.014	<0.001	<0.001	<0.0001	<0.05	0.003	<0.005

Table 10: Nutrient, TSS and TDS concentrations in the Beth 7 DMPA

Date		Site ID		Nutrients		TSS	TDS
Units				(mg/L)			
		TN	TKN	NH4	NO _x -N		
DGV		-	-	-	0.082	-	-
13/09/22	MWPA-N	1.1	1.1	<0.02	<0.01	11	36000
	MWPA-S	1.1	1.1	<0.02	<0.01	7	36000
19/09/22	MWPA-N	5.5	1.9	<0.02	<0.01	<5	34000
	MWPA-S	5.5	1.9	<0.02	<0.01	7	38000
27/09/23	MWPA-N	0.7	0.7	0.46	<0.01	17	37000
	MWPA-S	1.2	1.2	0.60	<0.01	25	39000
19/10/23	MWPA-N	1.0	1.0	<0.02	<0.01	5	37000
	MWPA-S	4.5	4.5	0.84	0.01	9	37000
26/10/22	MWPA-N	0.3	0.3	<0.02	<0.01	16	34000
	MWPA-S	0.2	0.2	<0.02	<0.01	9	30000
19/12/22	MWPA-N	0.9	0.9	0.05	<0.01	24	39000
	MWPA-S	1.0	1.0	0.01	<0.01	5	34000

5. Conclusion

A successful dredging campaign was implemented to remove accumulated sediments from the entrance to the FBH and adjacent Lives Beach to ensure safe navigable access to the FBH. Dredging commenced on 10th of September and the 4th of December, where 22,291.29m³ of sediments were relocated to the Berth 7 DMPA. The project EIA (O2 Marine 2022a) predicted negligible impacts based on the sediment characterisation assessment (O2 Marine 2022b) and therefore the DEMP (O2 Marine 2022c) outlined a validation program aimed to ensure the predicted environmental impacts were realised. The DEMP outlined the project MTs and EPOs, along with trigger levels for assessment of the data obtained under the TRM program. In addition, MWPA elected to also implement a PWQM program to gather further data and understanding of the water quality changes within the DMPA and provide further assurance that the project resulted in no environmental impacts.

As required by the TRM program, a water quality logger was deployed to collect DO and pH data at the boundary of the LEPA/MEPA during and post dredging. Due to equipment failure, only 11 days of data was obtained from the dredge period and the first half of the post-dredge period was also impacted, with data obtained between the 22 December 2022 and 11 January 2023.

Data from recovered both the pre- and post-dredge periods identified water quality that was commensurate with a moderate level of ecological protection, with DO remaining above 87% saturation and pH above 8.13. These values are well above the defined trigger levels and therefore data suggests that no impacts have occurred, and therefore the MTs and EPOs for the project would have been achieved.

The additional data collected by MWPA under the PWQM program confirmed these results with no exceedances of pH within the Berth 7 DMPA being identified below the trigger levels prior to any subsequent dilution occurring within the LEPA. Metals, nutrient and solids were also collected with only two exceedances of the 90% SPL reported for copper. This exceedance should not be considered an actual exceedance as the 90% SPL is applicable only at the LEPA/MEPA boundary allowing for initial point source dilutions to occur. Thus, initial dilution within the LEPA occurred, it is very unlikely these results for copper would result in any permanent environmental impact.

Based on these results, along with an understanding of water quality from the 2012 and 2021 maintenance dredging programs (GPA 2013; O2 Marine 2022d), there is very little evidence to suggest sediment acidification occurring during material placement within the Berth 7 DMPA, and therefore the

Management Target and the Environmental Protection Objectives at receiving environment at the LEPA/MEPA boundary was considered to have been achieved for the project.

6. References

- GPA (2013). *2012 Maintenance Dredge Project – Environmental Water Quality Monitoring Report*. Report prepared by the Geraldton Port Authority, July 2013.
- O2 Marine (2022a). *Geraldton Fishing Boat Harbour Entrance Maintenance Dredge 2022 - Environmental Impact Assessment*. Report prepared for Midwest Ports Authority. Report No. R210268.
- O2 Marine (2022b). *Fishing Boat Harbour Sediment Assessment 2022*. Report prepared by O2 Marine for Mid-West Ports Authority. Report No. T200090..
- O2 Marine (2022c). *Geraldton Fishing Boat Harbour Entrance Maintenance Dredge 2022 – Dredging Environmental Management Plan*. Report prepared for the Mid West Ports Authority, September 2022. Report No. R210268.
- O2 Marine (2022d). *2021 Maintenance Dredge Water Quality Close Out Report*. Report prepared by O2 Marine for Mid-West Ports Authority.

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Attention: David Jackson

Report 904160-W-V2
Project name B7 Pond - Baseline
Received Date Jul 07, 2022

Client Sample ID			B7 Pond - East
Sample Matrix			Water
Eurofins Sample No.			L22-JI0015785
Date Sampled			Jul 06, 2022
Test/Reference	LOR	Unit	
Acidity	5	mg CaCO ₃ /L	< 5
Ammonia-N	0.02	mg/L	0.03
Conductivity	10	uS/cm	56000
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01
Nitrate-N	0.01	mg/L	< 0.01
Nitrite-N	0.01	mg/L	< 0.01
NOx-N	0.01	mg/L	< 0.01
pH	0.1	pH Units	8.7
Sulfide	0.05	mg/L	< 0.05
Total Dissolved Solids	5	mg/L	33000
Total Kjeldahl Nitrogen	0.2	mg/L	1.4
Total Nitrogen	0.2	mg/L	1.4
Total Phosphorus	0.01	mg/L	< 0.01
Total Suspended Solids	5	mg/L	32
Heavy Metals			
Aluminium	0.05	mg/L	0.68
Aluminium (filtered)	0.05	mg/L	< 1
Arsenic	0.001	mg/L	0.007
Cadmium	0.0001	mg/L	0.0010
Chromium	0.001	mg/L	< 0.001
Cobalt	0.001	mg/L	0.004
Copper	0.001	mg/L	< 0.001
Iron	0.01	mg/L	0.47
Iron (filtered)	0.01	mg/L	< 1
Lead	0.001	mg/L	0.004
Manganese	0.005	mg/L	0.020
Molybdenum	0.001	mg/L	0.024
Nickel	0.001	mg/L	< 0.001
Selenium	0.001	mg/L	0.010
Zinc	0.005	mg/L	< 0.005
Heavy Metals			
Magnesium	0.5	mg/L	1500
Alkali Metals			
Calcium	0.5	mg/L	450
Potassium	0.5	mg/L	440
Sodium	0.5	mg/L	12000

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Jul 08, 2022	1 Day
- Method: ARL021 - Acidity in Water			
pH	Welshpool	Jul 08, 2022	1 Day
- Method: ARL014 - pH in Water			
Sulfide	Welshpool	Jul 08, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Total Suspended Solids	Welshpool	Jul 08, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Heavy Metals	Welshpool	Jul 29, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Jul 08, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkali Metals	Welshpool	Jul 29, 2022	6 Months
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Ammonia-N	Welshpool	Jul 08, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Jul 08, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Jul 08, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Jul 08, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Jul 08, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Jul 08, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Jul 08, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Jul 08, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Conductivity	Welshpool	Jul 08, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Jul 08, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0001			0.0001	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Iron	mg/L	< 0.01			0.01	Pass	
Iron (filtered)	mg/L	< 0.01			0.01	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Molybdenum	mg/L	< 0.001			0.001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Selenium	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Method Blank							
Heavy Metals							
Magnesium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	106			80-120	Pass	
Aluminium (filtered)	%	102			80-120	Pass	
Arsenic	%	104			80-120	Pass	
Cadmium	%	107			80-120	Pass	
Chromium	%	107			80-120	Pass	
Cobalt	%	106			80-120	Pass	
Copper	%	105			80-120	Pass	
Iron	%	106			80-120	Pass	
Iron (filtered)	%	101			80-120	Pass	
Lead	%	106			80-120	Pass	
Manganese	%	105			80-120	Pass	
Molybdenum	%	111			80-120	Pass	
Nickel	%	104			80-120	Pass	
Selenium	%	102			80-120	Pass	
Zinc	%	103			80-120	Pass	
LCS - % Recovery							
Heavy Metals							
Magnesium	%	104			80-120	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	95			80-120	Pass	
Potassium	%	100			80-120	Pass	
Sodium	%	103			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-JI0015785	CP	mg/L	33000	33000	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L22-JI0015785	CP	mg/L	0.68	0.68	<1	30%	Pass	
Arsenic	L22-JI0015785	CP	mg/L	0.007	0.006	15	30%	Pass	
Cadmium	L22-JI0015785	CP	mg/L	0.0010	0.0006	45	30%	Fail	Q15
Chromium	L22-JI0015785	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	L22-JI0015785	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	L22-JI0015785	CP	mg/L	0.004	0.008	83	30%	Fail	Q15
Manganese	L22-JI0015785	CP	mg/L	0.020	0.010	63	30%	Fail	Q15
Molybdenum	L22-JI0015785	CP	mg/L	0.024	0.020	17	30%	Pass	
Nickel	L22-JI0015785	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium	L22-JI0015785	CP	mg/L	0.010	< 0.001	200	30%	Fail	Q15
Zinc	L22-JI0015785	CP	mg/L	< 0.005	0.17	200	30%	Fail	Q15
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Magnesium	L22-JI0015785	CP	mg/L	1500	1500	3.4	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	L22-JI0015785	CP	mg/L	450	460	2.4	30%	Pass	
Potassium	L22-JI0015785	CP	mg/L	440	450	3.8	30%	Pass	
Sodium	L22-JI0015785	CP	mg/L	12000	12000	3.7	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Tracey Johnston	Analytical Services Manager
Douglas Todd	Senior Analyst-Inorganic
Elden Garrett	Senior Analyst-Metal
Kim Rodgers	Senior Analyst-Metal
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Attention: **David Jackson**

Report **923781-W**
Project name **B7 Pond Week 1**
Received Date **Sep 14, 2022**

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0033171	L22-Se0033172	L22-Se0033173	L22-Se0033174
Date Sampled			Sep 13, 2022	Sep 13, 2022	Sep 13, 2022	Sep 13, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	9.9	-	-	-
Alkalinity	5	mg CaCO ₃ /L	140	-	-	-
Ammonia-N	0.02	mg/L	< 0.02	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	140	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	20000	-	-	-
Conductivity	10	uS/cm	54000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	7.9	-	-	-
Sulfate	1	mg/L	2600	-	-	-
Total Dissolved Solids	5	mg/L	36000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	1.1	-	-	-
Total Nitrogen	0.2	mg/L	1.1	-	-	-
Total Phosphorus	0.01	mg/L	0.06	-	-	-
Total Suspended Solids	5	mg/L	11	-	-	-
Sulfide	0.05	mg/L	-	-	-	0.08
Heavy Metals						
Aluminium	0.05	mg/L	-	0.08	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.003	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.003	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	0.003	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	0.001	-	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-
Iron	0.01	mg/L	-	0.06	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.011	-	-

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0033171	L22-Se0033172	L22-Se0033173	L22-Se0033174
Date Sampled			Sep 13, 2022	Sep 13, 2022	Sep 13, 2022	Sep 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Molybdenum (filtered)	0.001	mg/L	-	-	0.012	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	< 0.001	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.004	-
Zinc	0.005	mg/L	-	0.010	-	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0033175	L22-Se0033176	L22-Se0033177	L22-Se0033178
Date Sampled			Sep 13, 2022	Sep 13, 2022	Sep 13, 2022	Sep 13, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	11	-	-	-
Alkalinity	5	mg CaCO ₃ /L	130	-	-	-
Ammonia-N	0.02	mg/L	0.08	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	130	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	20000	-	-	-
Conductivity	10	uS/cm	55000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	0.01	-	-	-
pH	0.1	pH Units	7.9	-	-	-
Sulfate	1	mg/L	2600	-	-	-
Total Dissolved Solids	5	mg/L	36000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	1.1	-	-	-
Total Nitrogen	0.2	mg/L	1.1	-	-	-
Total Phosphorus	0.01	mg/L	0.05	-	-	-
Total Suspended Solids	5	mg/L	7.0	-	-	-
Sulfide	0.05	mg/L	-	-	-	0.09
Heavy Metals						
Aluminium	0.05	mg/L	-	0.07	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.003	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.003	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	< 0.001	-	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0033175	L22-Se0033176	L22-Se0033177	L22-Se0033178
Date Sampled			Sep 13, 2022	Sep 13, 2022	Sep 13, 2022	Sep 13, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron	0.01	mg/L	-	0.02	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.012	-	-
Molybdenum (filtered)	0.001	mg/L	-	-	0.013	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	0.003	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.004	-
Zinc	0.005	mg/L	-	0.006	-	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Sep 15, 2022	1 Day
- Method: ARL021 - Acidity in Water			
pH	Welshpool	Sep 15, 2022	1 Day
- Method: ARL014 - pH in Water			
Total Suspended Solids	Welshpool	Sep 15, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Sulfide	Welshpool	Sep 15, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Heavy Metals	Welshpool	Sep 20, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Sep 15, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Sep 15, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Sep 15, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Sep 15, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Sep 15, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Sep 15, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Sep 15, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Sep 15, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Sep 15, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Sep 15, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Sep 15, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Sep 15, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Sep 15, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Chloride	Welshpool	Sep 15, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Sep 15, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Conductivity	Welshpool	Sep 15, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Sep 15, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Ammonia-N			mg/L	< 0.02			0.02	Pass	
Chloride			mg/L	< 5			5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01			0.01	Pass	
Nitrate-N			mg/L	< 0.01			0.01	Pass	
Nitrite-N			mg/L	< 0.01			0.01	Pass	
NOx-N			mg/L	< 0.01			0.01	Pass	
Sulfate			mg/L	< 1			1	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	L22-Se0033173	CP	%	96			75-125	Pass	
Arsenic (filtered)	L22-Se0033173	CP	%	131			75-125	Fail	
Cadmium (filtered)	L22-Se0033173	CP	%	86			75-125	Pass	
Chromium (filtered)	L22-Se0033173	CP	%	137			75-125	Fail	Q08
Copper (filtered)	L22-Se0033173	CP	%	60			75-125	Fail	Q08
Lead (filtered)	L22-Se0033173	CP	%	71			75-125	Fail	
Molybdenum (filtered)	L22-Se0033173	CP	%	90			75-125	Pass	
Nickel (filtered)	L22-Se0033173	CP	%	64			75-125	Fail	Q08
Selenium (filtered)	L22-Se0033173	CP	%	130			75-125	Fail	
Zinc (filtered)	L22-Se0033173	CP	%	62			75-125	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	L22-Se0033176	CP	%	95			75-125	Pass	
Arsenic	L22-Se0033176	CP	%	123			75-125	Pass	
Cadmium	L22-Se0033176	CP	%	93			75-125	Pass	
Chromium	L22-Se0033176	CP	%	88			75-125	Pass	
Copper	L22-Se0033176	CP	%	66			75-125	Fail	Q08
Iron	L22-Se0033176	CP	%	79			75-125	Pass	
Lead	L22-Se0033176	CP	%	73			75-125	Fail	Q08
Molybdenum	L22-Se0033176	CP	%	107			75-125	Pass	
Nickel	L22-Se0033176	CP	%	67			75-125	Fail	Q08
Selenium	L22-Se0033176	CP	%	121			75-125	Pass	Q08
Zinc	L22-Se0033176	CP	%	63			75-125	Fail	Q08
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Sulfide	L22-Se0033174	CP	mg/L	0.08	0.10	21	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-Se0033175	CP	mg/L	36000	35000	2.8	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Tracey Johnston	Analytical Services Manager
Kim Rodgers	Senior Analyst-Inorganic
Kim Rodgers	Senior Analyst-Metal
Lauren Killin	Senior Analyst-Inorganic
Maxine Saw	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Mid West Ports Authority
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WA 6531



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 Arrangement for the mutual recognition of the
 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **David Jackson**

Report **925840-W**
Project name **B7 Pond Week 2**
Received Date **Sep 21, 2022**

Client Sample ID			MWPA-N1 B7 Pond-North Site	MWPA-N2 B7 Pond-North Site	MWPA-N3 B7 Pond-North Site	MWPA-N4 B7 Pond-North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0050350	L22-Se0050351	L22-Se0050352	L22-Se0050353
Date Sampled			Sep 19, 2022	Sep 19, 2022	Sep 19, 2022	Sep 19, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	15	-	-	-
Alkalinity	5	mg CaCO ₃ /L	140	-	-	-
Ammonia-N	0.02	mg/L	< 0.02	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	140	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	21000	-	-	-
Conductivity	10	uS/cm	52000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	7.9	-	-	-
Sulfate	1	mg/L	2400	-	-	-
Total Dissolved Solids	5	mg/L	34000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	5.5	-	-	-
Total Nitrogen	0.2	mg/L	5.5	-	-	-
Total Phosphorus	0.01	mg/L	0.08	-	-	-
Total Suspended Solids	5	mg/L	< 5	-	-	-
Sulfide	0.05	mg/L	-	-	-	< 0.05
Heavy Metals						
Aluminium	0.05	mg/L	-	< 0.05	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.006	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.006	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	< 0.001	-	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-
Iron	0.01	mg/L	-	< 0.01	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.013	-	-

Client Sample ID			MWPA-N1 B7 Pond-North Site	MWPA-N2 B7 Pond-North Site	MWPA-N3 B7 Pond-North Site	MWPA-N4 B7 Pond-North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0050350	L22-Se0050351	L22-Se0050352	L22-Se0050353
Date Sampled			Sep 19, 2022	Sep 19, 2022	Sep 19, 2022	Sep 19, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Molybdenum (filtered)	0.001	mg/L	-	-	0.013	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	0.004	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.004	-
Zinc	0.005	mg/L	-	0.008	-	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Client Sample ID			MWPA-S1 B7 Pond-South Site	MWPA-S2 B7 Pond-South Site	MWPA-S3 B7 Pond-South Site	MWPA-S4 B7 Pond-South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0050354	L22-Se0050355	L22-Se0050356	L22-Se0050357
Date Sampled			Sep 19, 2022	Sep 19, 2022	Sep 19, 2022	Sep 19, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	13	-	-	-
Alkalinity	5	mg CaCO ₃ /L	130	-	-	-
Ammonia-N	0.02	mg/L	< 0.02	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	130	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	22000	-	-	-
Conductivity	10	uS/cm	54000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	7.9	-	-	-
Sulfate	1	mg/L	2400	-	-	-
Total Dissolved Solids	5	mg/L	38000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	1.9	-	-	-
Total Nitrogen	0.2	mg/L	1.9	-	-	-
Total Phosphorus	0.01	mg/L	0.08	-	-	-
Total Suspended Solids	5	mg/L	7.0	-	-	-
Sulfide	0.05	mg/L	-	-	-	0.05
Heavy Metals						
Aluminium	0.05	mg/L	-	< 0.05	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.006	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.006	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	< 0.001	-	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-

Client Sample ID			MWPA-S1 B7 Pond-South Site	MWPA-S2 B7 Pond-South Site	MWPA-S3 B7 Pond-South Site	MWPA-S4 B7 Pond-South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0050354	L22-Se0050355	L22-Se0050356	L22-Se0050357
Date Sampled			Sep 19, 2022	Sep 19, 2022	Sep 19, 2022	Sep 19, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron	0.01	mg/L	-	0.01	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.013	-	-
Molybdenum (filtered)	0.001	mg/L	-	-	0.013	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	0.003	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.003	-
Zinc	0.005	mg/L	-	0.007	-	-
Zinc (filtered)	0.005	mg/L	-	-	0.006	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Sep 23, 2022	1 Day
- Method: ARL021 - Acidity in Water			
pH	Welshpool	Sep 23, 2022	1 Day
- Method: ARL014 - pH in Water			
Total Suspended Solids	Welshpool	Sep 23, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Sulfide	Welshpool	Sep 23, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Heavy Metals	Welshpool	Sep 23, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Sep 23, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Sep 23, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Sep 23, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Sep 23, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Sep 23, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Sep 23, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Sep 23, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Sep 23, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Sep 23, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Sep 23, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Sep 23, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Sep 23, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Sep 23, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Chloride	Welshpool	Sep 23, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Sep 23, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Conductivity	Welshpool	Sep 23, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Sep 23, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Ammonia-N			mg/L	< 0.02			0.02	Pass	
Chloride			mg/L	< 5			5	Pass	
Filterable Reactive Phosphorus			mg/L	< 0.01			0.01	Pass	
Nitrate-N			mg/L	< 0.01			0.01	Pass	
Nitrite-N			mg/L	< 0.01			0.01	Pass	
NOx-N			mg/L	< 0.01			0.01	Pass	
Sulfate			mg/L	< 1			1	Pass	
Total Nitrogen			mg/L	< 0.2			0.2	Pass	
Total Phosphorus			mg/L	< 0.01			0.01	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity	L22-Se0050350	CP	uS/cm	52000	53000	1.3	20%	Pass	
pH	L22-Se0050350	CP	pH Units	7.9	7.9	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-Se0050354	CP	mg/L	38000	37000	2.7	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	No
Appropriate sample containers have been used	No
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Tracey Johnston	Analytical Services Manager
Kim Rodgers	Senior Analyst-Metal
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Mid West Ports Authority
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 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Bijal Suthar**

Report **927498-W**
Project name **B7 POND WEEK 3**
Received Date **Sep 29, 2022**

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0062938	L22-Se0062939	L22-Se0062940	L22-Se0062941
Date Sampled			Sep 27, 2022	Sep 27, 2022	Sep 27, 2022	Sep 27, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	< 5	-	-	-
Alkalinity	5	mg CaCO ₃ /L	150	-	-	-
Ammonia-N	0.02	mg/L	0.46	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	130	-	-	-
Carbonate	5	mg CaCO ₃ /L	18	-	-	-
Chloride	5	mg/L	23000	-	-	-
Conductivity	10	uS/cm	54000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	8.4	-	-	-
Sulfate	1	mg/L	2300	-	-	-
Total Dissolved Solids	5	mg/L	37000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	0.7	-	-	-
Total Nitrogen	0.2	mg/L	0.7	-	-	-
Total Phosphorus	0.01	mg/L	< 0.01	-	-	-
Total Suspended Solids	5	mg/L	17	-	-	-
Sulfide	0.05	mg/L	-	-	-	< 0.05
Heavy Metals						
Aluminium	0.05	mg/L	-	0.14	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.005	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.007	-
Cadmium	0.0001	mg/L	-	0.0002	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	0.001	-
Copper	0.001	mg/L	-	0.007	-	-
Copper (filtered)	0.001	mg/L	-	-	0.012	-
Iron	0.01	mg/L	-	0.04	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	0.001	-
Molybdenum	0.001	mg/L	-	0.013	-	-

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0062938	L22-Se0062939	L22-Se0062940	L22-Se0062941
Date Sampled			Sep 27, 2022	Sep 27, 2022	Sep 27, 2022	Sep 27, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Molybdenum (filtered)	0.001	mg/L	-	-	0.012	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	0.004	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.002	-
Zinc	0.005	mg/L	-	0.017	-	-
Zinc (filtered)	0.005	mg/L	-	-	0.007	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0062942	L22-Se0062943	L22-Se0062944	L22-Se0062945
Date Sampled			Sep 27, 2022	Sep 27, 2022	Sep 27, 2022	Sep 27, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	12	-	-	-
Alkalinity	5	mg CaCO ₃ /L	140	-	-	-
Ammonia-N	0.02	mg/L	0.60	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	140	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	22000	-	-	-
Conductivity	10	uS/cm	54000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	7.9	-	-	-
Sulfate	1	mg/L	2300	-	-	-
Total Dissolved Solids	5	mg/L	39000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	1.2	-	-	-
Total Nitrogen	0.2	mg/L	1.2	-	-	-
Total Phosphorus	0.01	mg/L	0.03	-	-	-
Total Suspended Solids	5	mg/L	25	-	-	-
Sulfide	0.05	mg/L	-	-	-	< 0.05
Heavy Metals						
Aluminium	0.05	mg/L	-	< 0.05	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.004	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.006	-
Cadmium	0.0001	mg/L	-	0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	0.003	-	-
Copper (filtered)	0.001	mg/L	-	-	0.017	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-Se0062942	L22-Se0062943	L22-Se0062944	L22-Se0062945
Date Sampled			Sep 27, 2022	Sep 27, 2022	Sep 27, 2022	Sep 27, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron	0.01	mg/L	-	0.04	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.011	-	-
Molybdenum (filtered)	0.001	mg/L	-	-	0.011	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	0.004	-	-
Selenium (filtered)	0.001	mg/L	-	-	< 0.001	-
Zinc	0.005	mg/L	-	0.010	-	-
Zinc (filtered)	0.005	mg/L	-	-	0.008	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Sep 29, 2022	1 Day
- Method: ARL021 - Acidity in Water			
pH	Welshpool	Sep 29, 2022	1 Day
- Method: ARL014 - pH in Water			
Total Suspended Solids	Welshpool	Sep 29, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Sulfide	Welshpool	Sep 29, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Heavy Metals	Welshpool	Oct 03, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Sep 29, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Sep 29, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Sep 29, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Sep 29, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Sep 29, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Sep 29, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Sep 29, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Sep 29, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Sep 29, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Sep 29, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Sep 29, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Sep 29, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Sep 29, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Chloride	Welshpool	Sep 29, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Sep 29, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Conductivity	Welshpool	Sep 29, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Sep 29, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Cadmium (filtered)			mg/L	< 0.0001			0.0001	Pass	
Lead (filtered)			mg/L	< 0.001			0.001	Pass	
Molybdenum (filtered)			mg/L	< 0.001			0.001	Pass	
Nickel (filtered)			mg/L	< 0.001			0.001	Pass	
Zinc (filtered)			mg/L	< 0.005			0.005	Pass	
LCS - % Recovery									
Heavy Metals									
Cadmium (filtered)			%	105			80-120	Pass	
Chromium (filtered)			%	87			80-120	Pass	
Copper (filtered)			%	111			80-120	Pass	
Lead (filtered)			%	86			80-120	Pass	
Molybdenum (filtered)			%	98			80-120	Pass	
Nickel (filtered)			%	86			80-120	Pass	
Zinc (filtered)			%	106			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	L22-Se0062943	CP	%	97			75-125	Pass	
Arsenic	L22-Se0062943	CP	%	132			75-125	Fail	Q08
Cadmium	L22-Se0062943	CP	%	101			75-125	Pass	
Chromium	L22-Se0062943	CP	%	82			75-125	Pass	
Copper	L22-Se0062943	CP	%	64			75-125	Fail	Q08
Iron	L22-Se0062943	CP	%	80			75-125	Pass	
Lead	L22-Se0062943	CP	%	79			75-125	Pass	
Molybdenum	L22-Se0062943	CP	%	113			75-125	Pass	
Nickel	L22-Se0062943	CP	%	71			75-125	Fail	Q08
Selenium	L22-Se0062943	CP	%	124			75-125	Pass	
Zinc	L22-Se0062943	CP	%	69			75-125	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	L22-Se0062944	CP	%	117			75-125	Pass	
Arsenic (filtered)	L22-Se0062944	CP	%	110			75-125	Pass	
Cadmium (filtered)	L22-Se0062944	CP	%	90			75-125	Pass	
Chromium (filtered)	L22-Se0062944	CP	%	86			75-125	Pass	
Lead (filtered)	L22-Se0062944	CP	%	95			75-125	Pass	
Molybdenum (filtered)	L22-Se0062944	CP	%	88			75-125	Pass	
Nickel (filtered)	L22-Se0062944	CP	%	83			75-125	Pass	
Selenium (filtered)	L22-Se0062944	CP	%	95			75-125	Pass	
Zinc (filtered)	L22-Se0062944	CP	%	81			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-Se0062938	CP	mg/L	37000	34000	8.5	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	L22-Se0062940	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic (filtered)	L22-Se0062940	CP	mg/L	0.007	0.007	5.2	30%	Pass	
Cadmium (filtered)	L22-Se0062940	CP	mg/L	0.0001	0.0001	2.5	30%	Pass	
Molybdenum (filtered)	L22-Se0062940	CP	mg/L	0.012	0.012	2.3	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Nickel (filtered)	L22-Se0062940	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Zinc (filtered)	L22-Se0062940	CP	mg/L	0.007	0.006	24	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Douglas Todd	Analytical Services Manager
Kim Rodgers	Senior Analyst-Metal
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: **David Jackson**

Report **933730-W**
Project name **B7 POND WEEK 4**
Received Date **Oct 20, 2022**

Client Sample ID			MWPA-N B7 Pond - North Site	MWPA-S B7 Pond - South Site
Sample Matrix			Water	Water
Eurofins Sample No.			L22- Oc0043335	L22- Oc0043336
Date Sampled			Oct 19 2022	Oct 19, 2022
Test/Reference	LOR	Unit		
Acidity	5	mg CaCO ₃ /L	13	13
Alkalinity	5	mg CaCO ₃ /L	160	150
Ammonia-N	0.02	mg/L	< 0.02	0.84
Bicarbonate	5	mg CaCO ₃ /L	160	150
Carbonate	5	mg CaCO ₃ /L	< 5	< 5
Chloride	5	mg/L	21000	22000
Conductivity	10	uS/cm	57000	57000
Filterable Reactive Phosphorus	0.01	mg/L	0.02	0.16
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01
NOx-N	0.01	mg/L	< 0.01	0.01
pH	0.1	pH Units	7.8	7.8
Sulfate	1	mg/L	2900	2900
Sulfide	0.05	mg/L	0.06	< 0.05
Total Dissolved Solids	5	mg/L	37000	37000
Total Kjeldahl Nitrogen	0.2	mg/L	1.0	4.5
Total Nitrogen	0.2	mg/L	1.0	4.5
Total Phosphorus	0.01	mg/L	0.14	0.15
Total Suspended Solids	5	mg/L	5.0	9.0
Heavy Metals				
Aluminium	0.05	mg/L	< 0.05	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05
Arsenic	0.001	mg/L	0.008	0.008
Arsenic (filtered)	0.001	mg/L	0.009	0.009
Cadmium	0.0001	mg/L	< 0.0001	< 0.0001
Cadmium (filtered)	0.0001	mg/L	< 0.0001	< 0.0001
Chromium	0.001	mg/L	< 0.001	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001
Iron	0.01	mg/L	0.01	< 0.01
Lead	0.001	mg/L	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001
Molybdenum	0.001	mg/L	0.012	0.011

Client Sample ID			MWPA-N B7 Pond - North Site	MWPA-S B7 Pond - South Site
Sample Matrix			Water	Water
Eurofins Sample No.			L22- Oc0043335	L22- Oc0043336
Date Sampled			Oct 19, 2022	Oct 19, 2022
Test/Reference	LOR	Unit		
Heavy Metals				
Molybdenum (filtered)	0.001	mg/L	0.014	0.014
Nickel	0.001	mg/L	0.001	< 0.001
Nickel (filtered)	0.001	mg/L	0.001	< 0.001
Selenium	0.001	mg/L	0.003	0.002
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001
Zinc	0.005	mg/L	0.006	0.006
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Oct 21, 2022	1 Day
- Method: ARL021 - Acidity in Water			
Chloride	Welshpool	Oct 21, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
pH	Welshpool	Oct 21, 2022	1 Day
- Method: ARL014 - pH in Water			
Sulfate	Welshpool	Oct 21, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Sulfide	Welshpool	Oct 21, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Total Suspended Solids	Welshpool	Oct 21, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Heavy Metals	Welshpool	Oct 26, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Oct 21, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Oct 21, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Oct 21, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Oct 21, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Oct 21, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Oct 21, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Oct 21, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Oct 21, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Oct 21, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Oct 21, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Oct 21, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Oct 21, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Oct 21, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Conductivity	Welshpool	Oct 21, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Oct 21, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia-N	L22-Oc0043336	CP	%	98			80-120	Pass	
Filterable Reactive Phosphorus	L22-Oc0043336	CP	%	110			80-120	Pass	
Nitrate-N	L22-Oc0043336	CP	%	91			70-130	Pass	
Nitrite-N	L22-Oc0043336	CP	%	109			80-120	Pass	
NOx-N	L22-Oc0043336	CP	%	98			80-120	Pass	
Total Phosphorus	L22-Oc0043336	CP	%	110			80-120	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	L22-Oc0043336	CP	%	94			75-125	Pass	
Arsenic	L22-Oc0043336	CP	%	109			75-125	Pass	
Cadmium	L22-Oc0043336	CP	%	91			75-125	Pass	
Chromium	L22-Oc0043336	CP	%	84			75-125	Pass	
Copper	L22-Oc0043336	CP	%	67			75-125	Fail	
Iron	L22-Oc0043336	CP	%	79			75-125	Pass	
Lead	L22-Oc0043336	CP	%	74			75-125	Fail	Q08
Molybdenum	L22-Oc0043336	CP	%	103			75-125	Pass	
Nickel	L22-Oc0043336	CP	%	71			75-125	Fail	
Selenium	L22-Oc0043336	CP	%	108			75-125	Pass	
Zinc	L22-Oc0043336	CP	%	65			75-125	Fail	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia-N	L22-Oc0043335	CP	mg/L	< 0.02	< 0.02	<1	20%	Pass	
Chloride	L22-Oc0043335	CP	mg/L	21000	22000	4.8	30%	Pass	
Filterable Reactive Phosphorus	L22-Oc0043335	CP	mg/L	0.02	0.02	<1	20%	Pass	
Nitrate-N	L22-Oc0043335	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nitrite-N	L22-Oc0043335	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx-N	L22-Oc0043335	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Sulfate	L22-Oc0043335	CP	mg/L	2900	2400	18	30%	Pass	
Total Phosphorus	L22-Oc0043335	CP	mg/L	0.14	0.15	2.7	20%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L22-Oc0043335	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic	L22-Oc0043335	CP	mg/L	0.008	0.008	4.6	30%	Pass	
Cadmium	L22-Oc0043335	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Chromium	L22-Oc0043335	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	L22-Oc0043335	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	L22-Oc0043335	CP	mg/L	0.01	< 0.01	21	30%	Pass	
Lead	L22-Oc0043335	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Molybdenum	L22-Oc0043335	CP	mg/L	0.012	0.012	<1	30%	Pass	
Nickel	L22-Oc0043335	CP	mg/L	0.001	< 0.001	12	30%	Pass	
Selenium	L22-Oc0043335	CP	mg/L	0.003	0.003	7.6	30%	Pass	
Zinc	L22-Oc0043335	CP	mg/L	0.006	< 0.005	23	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-Oc0043336	CP	mg/L	37000	38000	2.7	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Tracey Johnston	Analytical Services Manager
Kim Rodgers	Senior Analyst-Metal
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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 equivalence of testing, medical testing, calibration,
 inspection, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **David Jackson**

Report **935561-W**
 Project name **B7 POND WEEK 5**
 Received Date **Oct 27, 2022**

Client Sample ID			MWPA-N North Site	MWPA-S South Site
Sample Matrix			Water	Water
Eurofins Sample No.			L22- Oc0057990	L22- Oc0057991
Date Sampled			Oct 26, 2022	Oct 26, 2022
Test/Reference	LOR	Unit		
Acidity	5	mg CaCO ₃ /L	5.6	< 5
Alkalinity	5	mg CaCO ₃ /L	150	150
Ammonia-N	0.02	mg/L	< 0.02	< 0.02
Bicarbonate	5	mg CaCO ₃ /L	150	150
Carbonate	5	mg CaCO ₃ /L	< 5	< 5
Chloride	5	mg/L	19000	21000
Conductivity	10	uS/cm	58000	58000
Filterable Reactive Phosphorus	0.01	mg/L	< 0.01	< 0.01
Hydroxide	5	mg CaCO ₃ /L	< 5	< 5
Nitrate-N	0.01	mg/L	< 0.01	< 0.01
Nitrite-N	0.01	mg/L	< 0.01	< 0.01
NOx-N	0.01	mg/L	< 0.01	< 0.01
pH	0.1	pH Units	8.2	8.2
Sulfate	1	mg/L	2900	2900
Sulfide	0.05	mg/L	0.06	< 0.05
Total Dissolved Solids	5	mg/L	34000	30000
Total Kjeldahl Nitrogen	0.2	mg/L	0.3	0.2
Total Nitrogen	0.2	mg/L	0.3	0.2
Total Phosphorus	0.01	mg/L	0.11	0.16
Total Suspended Solids	5	mg/L	16	9.0
Heavy Metals				
Aluminium	0.05	mg/L	< 0.05	< 0.5
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05
Arsenic	0.001	mg/L	0.006	< 0.01
Arsenic (filtered)	0.001	mg/L	0.005	0.006
Cadmium	0.0001	mg/L	< 0.0001	< 0.002
Cadmium (filtered)	0.0001	mg/L	< 0.0001	< 0.0001
Chromium	0.001	mg/L	< 0.001	< 0.01
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001
Copper	0.001	mg/L	0.015	^{R16} < 0.01
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001
Iron	0.01	mg/L	0.07	< 0.5
Lead	0.001	mg/L	0.001	< 0.01
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001
Molybdenum	0.001	mg/L	0.012	0.012

Client Sample ID			MWPA-N North Site	MWPA-S South Site
Sample Matrix			Water	Water
Eurofins Sample No.			L22- Oc0057990	L22- Oc0057991
Date Sampled			Oct 26, 2022	Oct 26, 2022
Test/Reference	LOR	Unit		
Heavy Metals				
Molybdenum (filtered)	0.001	mg/L	0.018	0.018
Nickel	0.001	mg/L	< 0.001	< 0.01
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001
Selenium	0.001	mg/L	0.006	0.021
Selenium (filtered)	0.001	mg/L	0.003	0.003
Zinc	0.005	mg/L	0.018	< 0.05
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Oct 27, 2022	1 Day
- Method: ARL021 - Acidity in Water			
Chloride	Welshpool	Oct 27, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
pH	Welshpool	Oct 27, 2022	1 Day
- Method: ARL014 - pH in Water			
Sulfate	Welshpool	Oct 27, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Sulfide	Welshpool	Oct 27, 2022	7 Days
- Method: ARL No. 324 - Sulfide and Hydrogen Sulfide by Microdistillation			
Total Suspended Solids	Welshpool	Oct 27, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Heavy Metals	Welshpool	Oct 27, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Oct 27, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Oct 27, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Oct 27, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Oct 27, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Oct 27, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Oct 27, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Oct 27, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Oct 27, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Oct 27, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Oct 27, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Oct 27, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Oct 27, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Oct 27, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Conductivity	Welshpool	Oct 27, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Oct 27, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Sulfide	L22-Oc0057990	CP	mg/L	0.06	< 0.05	22	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	L22-Oc0057991	CP	mg/L	30000	30000	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R16	The LORs have been raised due to the high concentration of one or more analytes

Authorised by:

Tracey Johnston	Analytical Services Manager
Douglas Todd	Senior Analyst-Inorganic
Kim Rodgers	Senior Analyst-Metal
Maxine Saw	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Mid West Ports Authority
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Geraldton
WA 6531



NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection, proficiency testing scheme providers and
reference materials producers reports and certificates.

Attention: David Jackson

Report 952150-W
Project name B7 POND - Post Dredge
Received Date Dec 20, 2022

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0047904	L22-De0047905	L22-De0047906	L22-De0047907
Date Sampled			Dec 19, 2022	Dec 19, 2022	Dec 19, 2022	Dec 19, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	< 5	-	-	-
Alkalinity	5	mg CaCO ₃ /L	150	-	-	-
Ammonia-N	0.02	mg/L	0.05	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	130	-	-	-
Carbonate	5	mg CaCO ₃ /L	21	-	-	-
Chloride	5	mg/L	21000	-	-	-
Conductivity	10	uS/cm	56000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	0.02	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	8.5	-	-	-
Sulfate	1	mg/L	2800	-	-	-
Total Dissolved Solids	5	mg/L	39000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	0.9	-	-	-
Total Nitrogen	0.2	mg/L	0.9	-	-	-
Total Phosphorus	0.01	mg/L	0.06	-	-	-
Total Suspended Solids	5	mg/L	24	-	-	-
Sulphide (as S)	0.1	mg/L	-	-	-	< 0.1
Heavy Metals						
Aluminium	0.05	mg/L	-	0.54	-	-
Aluminium (filtered)	0.05	mg/L	-	-	0.08	-
Arsenic	0.001	mg/L	-	0.006	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.007	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	0.004	-	-
Copper (filtered)	0.001	mg/L	-	-	0.001	-
Iron	0.01	mg/L	-	0.07	-	-
Lead	0.001	mg/L	-	0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.015	-	-

Client Sample ID			MWPA - N1 B7 Pond - North Site	MWPA - N2 B7 Pond - North Site	MWPA - N3 B7 Pond - North Site	MWPA - N4 B7 Pond - North Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0047904	L22-De0047905	L22-De0047906	L22-De0047907
Date Sampled			Dec 19, 2022	Dec 19, 2022	Dec 19, 2022	Dec 19, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Molybdenum (filtered)	0.001	mg/L	-	-	0.014	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	< 0.001	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.002	-
Zinc	0.005	mg/L	-	0.011	-	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0047908	L22-De0047909	L22-De0047910	L22-De0047911
Date Sampled			Dec 19, 2022	Dec 19, 2022	Dec 19, 2022	Dec 19, 2022
Test/Reference	LOR	Unit				
Acidity	5	mg CaCO ₃ /L	< 5	-	-	-
Alkalinity	5	mg CaCO ₃ /L	150	-	-	-
Ammonia-N	0.02	mg/L	0.10	-	-	-
Bicarbonate	5	mg CaCO ₃ /L	140	-	-	-
Carbonate	5	mg CaCO ₃ /L	< 5	-	-	-
Chloride	5	mg/L	21000	-	-	-
Conductivity	10	uS/cm	55000	-	-	-
Filterable Reactive Phosphorus	0.01	mg/L	0.02	-	-	-
Hydroxide	5	mg CaCO ₃ /L	< 5	-	-	-
Nitrate-N	0.01	mg/L	< 0.01	-	-	-
Nitrite-N	0.01	mg/L	< 0.01	-	-	-
NOx-N	0.01	mg/L	< 0.01	-	-	-
pH	0.1	pH Units	8.3	-	-	-
Sulfate	1	mg/L	2800	-	-	-
Total Dissolved Solids	5	mg/L	34000	-	-	-
Total Kjeldahl Nitrogen	0.2	mg/L	1.0	-	-	-
Total Nitrogen	0.2	mg/L	1.0	-	-	-
Total Phosphorus	0.01	mg/L	0.08	-	-	-
Total Suspended Solids	5	mg/L	5.0	-	-	-
Sulphide (as S)	0.1	mg/L	-	-	-	< 0.1
Heavy Metals						
Aluminium	0.05	mg/L	-	0.08	-	-
Aluminium (filtered)	0.05	mg/L	-	-	< 0.05	-
Arsenic	0.001	mg/L	-	0.006	-	-
Arsenic (filtered)	0.001	mg/L	-	-	0.007	-
Cadmium	0.0001	mg/L	-	< 0.0001	-	-
Cadmium (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Chromium	0.001	mg/L	-	< 0.001	-	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper	0.001	mg/L	-	0.001	-	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-

Client Sample ID			MWPA - S1 B7 Pond - South Site	MWPA - S2 B7 Pond - South Site	MWPA - S3 B7 Pond - South Site	MWPA - S4 B7 Pond - South Site
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-De0047908	L22-De0047909	L22-De0047910	L22-De0047911
Date Sampled			Dec 19, 2022	Dec 19, 2022	Dec 19, 2022	Dec 19, 2022
Test/Reference	LOR	Unit				
Heavy Metals						
Iron	0.01	mg/L	-	0.02	-	-
Lead	0.001	mg/L	-	< 0.001	-	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Molybdenum	0.001	mg/L	-	0.016	-	-
Molybdenum (filtered)	0.001	mg/L	-	-	0.014	-
Nickel	0.001	mg/L	-	< 0.001	-	-
Nickel (filtered)	0.001	mg/L	-	-	< 0.001	-
Selenium	0.001	mg/L	-	< 0.001	-	-
Selenium (filtered)	0.001	mg/L	-	-	0.003	-
Zinc	0.005	mg/L	-	0.005	-	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acidity	Welshpool	Dec 22, 2022	1 Day
- Method: ARL021 - Acidity in Water			
pH	Welshpool	Dec 22, 2022	1 Day
- Method: ARL014 - pH in Water			
Total Suspended Solids	Welshpool	Dec 22, 2022	7 Days
- Method: ARL No. 016 - Total Suspended Solids			
Sulphide (as S)	Melbourne	Dec 22, 2022	28 Days
- Method: LTM-INO-4011 Suphide			
Heavy Metals	Welshpool	Dec 28, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals (filtered)	Welshpool	Dec 22, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Alkalinity	Welshpool	Dec 22, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Bicarbonate	Welshpool	Dec 22, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Carbonate	Welshpool	Dec 22, 2022	14 Days
- Method: ARL037 - Alkalinity in Water			
Hydroxide	Welshpool	Dec 22, 2022	14 Day
- Method: ARL037 - Alkalinity in Water			
Ammonia-N	Welshpool	Dec 22, 2022	28 Days
- Method: ARL303 - Ammonia in Water by Discrete Analyser			
Filterable Reactive Phosphorus	Welshpool	Dec 22, 2022	28 Days
- Method: ARL309 - Filterable Reactive Phosphorus in Water by Discrete Analyser			
Nitrate-N	Welshpool	Dec 22, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Nitrite-N	Welshpool	Dec 22, 2022	2 Days
- Method: ARL311 - Nitrite in Water by Discrete Analyser			
NOx-N	Welshpool	Dec 22, 2022	28 Days
- Method: ARL313/319 - NOx in Water by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Dec 20, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Nitrogen	Welshpool	Dec 22, 2022	28 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
Total Phosphorus	Welshpool	Dec 22, 2022	28 Days
- Method: ARL308 - Total Phosphorus in Water by Discrete Analyser			
Chloride	Welshpool	Dec 22, 2022	28 Days
- Method: ARL305 - Chloride in Water by Discrete Analyser			
Sulfate	Welshpool	Dec 22, 2022	28 Days
- Method: ARL301 - Sulfate in Water by Discrete Analyser			
Conductivity	Welshpool	Dec 22, 2022	28 Days
- Method: ARL019 - Conductivity and Salinity in Water			
Total Dissolved Solids	Welshpool	Dec 22, 2022	7 Days
- Method: ARL No. 017 - Total Dissolved Solids			

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia-N	L22-De0047908	CP	%	107			80-120	Pass	
Filterable Reactive Phosphorus	L22-De0047908	CP	%	108			80-120	Pass	
Nitrate-N	L22-De0047908	CP	%	83			70-130	Pass	
Nitrite-N	L22-De0047908	CP	%	105			80-120	Pass	
NOx-N	L22-De0047908	CP	%	92			80-120	Pass	
Sulfate	L22-De0047908	CP	%	98			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Filterable Reactive Phosphorus	L22-De0047904	CP	mg/L	0.02	0.02	5.7	20%	Pass	
Nitrate-N	L22-De0047904	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nitrite-N	L22-De0047904	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
NOx-N	L22-De0047904	CP	mg/L	< 0.01	< 0.01	<1	20%	Pass	
Sulfate	L22-De0047904	CP	mg/L	2800	2800	1.1	30%	Pass	
Total Dissolved Solids	L22-De0047904	CP	mg/L	39000	36000	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity	L22-De0047908	CP	uS/cm	55000	56000	<1	20%	Pass	
pH	L22-De0047908	CP	pH Units	8.3	8.3	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Tracey Johnston	Analytical Services Manager
Douglas Todd	Senior Analyst-Inorganic
Kim Rodgers	Senior Analyst-Metal
Mary Makarios	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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