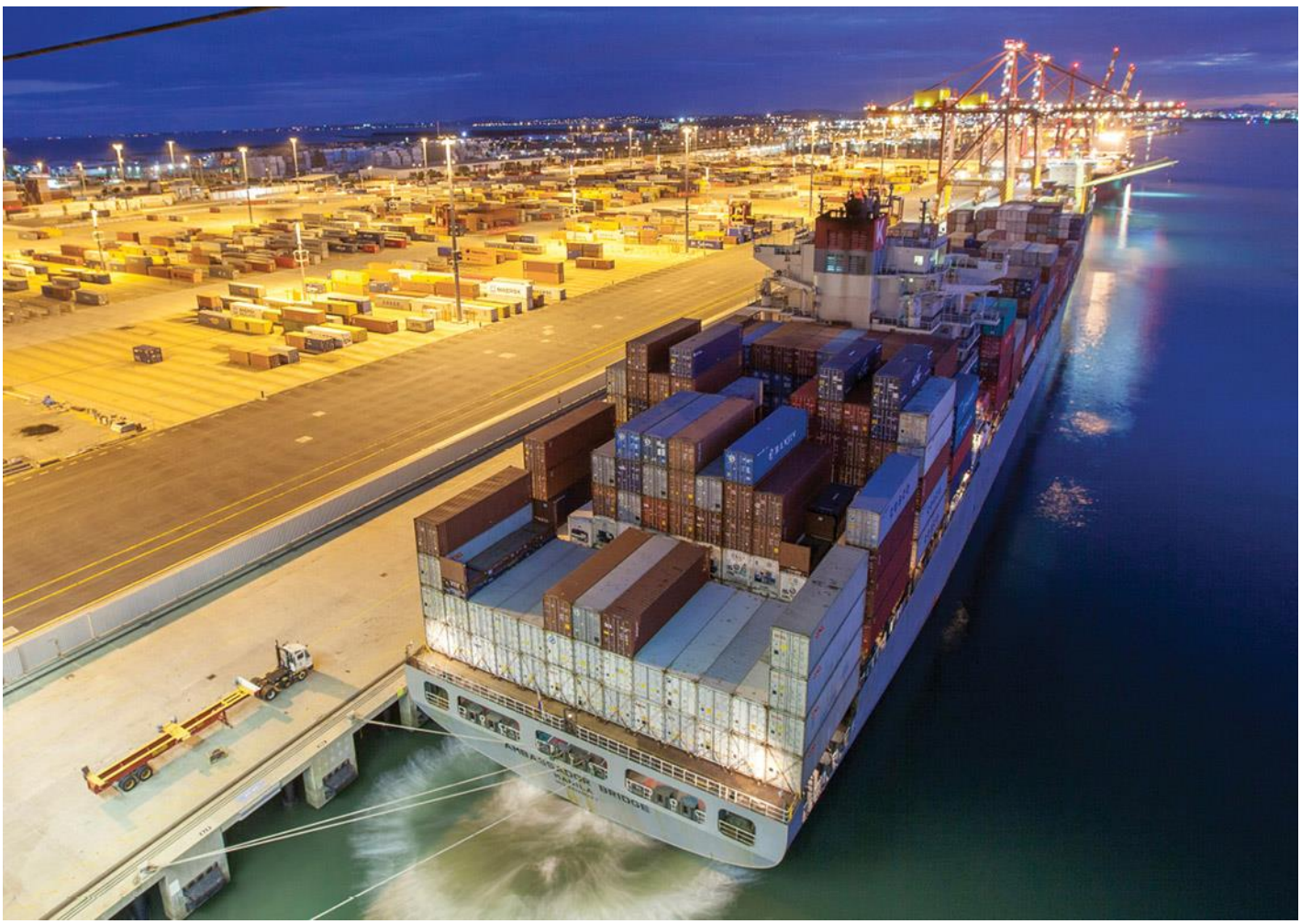
Drinking Water Service

2022-23 Annual Report

15 DECEMBER 2023



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Introduction

The Port of Brisbane is located at the mouth of the Brisbane River. The port is managed by the Port of Brisbane Pty Ltd (PBPL) and processes more than 2,600 ships each year.

PBPL is responsible for the site potable water reticulation network and is committed to ensuring that the water systems are managed so that the supply does not constitute a hazard to employees or the public. PBPL draws its drinking water supply from Urban Utilities' (UU) reticulated supply through metered supply points for Fisherman Islands, Port Gate, Port West, Port North and the Brisbane International Cruise Terminal (BICT). The management of water quality until it is supplied to PBPL is the responsibility of UU. The Australian Drinking Water Guidelines (ADWG) require management of drinking water quality through to the consumer and therefore PBPL is considered a Water Service Provider under Queensland legislation. PBPL is required to have a Drinking Water Quality Management Plan (DWQMP) in place to manage water quality within its reticulation system.

This report is the seventh annual report of the DWQMP and summarises all relevant actions taken in the 2022-23 financial year.

Purpose and objectives of the DWQMP

The PBPL DWQMP contributes to maintaining a safe and reliable drinking water supply for consumers. The plan is based on the principles described in the Framework for Management of Drinking Water Quality contained in the Australian Drinking Water Guidelines 2011, version 3.8 updated September 2022 (ADWG).

The purpose of the DWQMP is to provide an overview of PBPL's current management system for achieving/maintaining drinking water quality and plans to develop and continually improve the water quality management systems. The management plan focuses on the section of the drinking water scheme over which PBPL has direct control (reticulation operation, maintenance, monitoring, and corrective action). The supply components over which PBPL has no control (catchment management, treatment, and storage) are the responsibility of UU and SEQWater and are considered by their respective DWQMP's.

The PBPL DWQMP addresses the 12 elements of the ADWG Framework in order to meet the required levels of service relating to drinking water quality and the legislative requirements of the Queensland *Water Supply (Safety and Reliability) Act 2008* and the *Queensland Public Health Regulation 2018*. The specific objectives of the Drinking Water Quality Management Plan are:

- To demonstrate due diligence and protect public health by implementing a management strategy to ensure a high-quality water is supplied to consumers.
- To improve consumer confidence in water quality and the supplier.
- Clearly define current and future management procedures and strategies for maintaining water quality.
- Clearly define strategies for monitoring the quality of water supplied to consumers; and
- To implement a process for continual review, development, and improvement of the water quality management system.

Implementation of the DWQMP

Collaborative Risk Assessment workshop with UU

PBPL conducted a Risk assessment workshop with UU in June 2023 to identify risks associated with drinking water supply and quality. Two partners worked through the water quality notification trigger points and proposed improvement actions to mitigate the risk of water supply interruption to PBPL.

Authorised Person Training

Authorised Person training has been delivered by a third-party training provider for both PBPL and Trade Services contractor's relevant staff in November 2022.

Critical documents review

PBPL has reviewed and updated its Critical Incident Plan and Business Continuity Plan in April 2023 to address courses of action in the event of an emergency related to water and sewerage infrastructure.

Introduced maintenance schedule to prevent microorganism growth in buildings water system

PBPL started a six-monthly flushing/sanitation of amenities' taps inside PBPL's owned buildings to mitigate Legionella risk. In the meanwhile, Water and Sewerage update Newsletter addressing microorganisms' proliferation in buildings' water systems during warm summer months, has been released in PBPL's website on February 23 encouraging the building managers/occupiers to check and sanitize showers and water taps in accordance with
https://www.health.qld.gov.au/public-health/industry-environment/environment-land-water/water/risk-management/plan/manage

Monitoring and Compliance

Quarterly Monitoring

PBPL undertakes quarterly verification monitoring at five representative sites at the Port of Brisbane. The original DWQMP included only three test sites. A fourth site, Port West Bunnings, was added in September 2013 to capture water quality at the new PBPL Port West estate. A fifth site, reclamation, was added in May 2014 to capture water quality at the Port of Brisbane reclamation site office. An additional site located at the Brisbane International Cruise Terminal was added in June 2022 prior to operations commencing.

Verification sampling was undertaken September 2022, December 2022, March 2023 and June 2023 (Appendix). No exceedances were recorded in FY22-23. Elevated levels of heterotrophic plate count were detected during each sampling period across each site. No action was taken in regard to these levels.

E.coli Monitoring

PBPL undertake weekly monitoring for E.coli at the PBPL Main Office. Initial samples are tested in a desktop E.coli sample kit. Where results indicate possible E.coli, a sample is sent to a laboratory for analysis.

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
No. samples collected	4	4	4	4	4	3	4	4	5	4	4	5
No. samples collected in which E.coli detected	0	0	0	0	0	0	0	0	0	0	0	0
No. detections in previous 12 months	0	0	0	0	0	0	0	0	0	0	0	0
% samples that comply	100	100	100	100	100	100	100	100	100	100	100	100
Compliance with 98% annual value	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Incidents reported to the regulator

There were no incidents in the reporting period.

Drinking water quality related customer complaints

We have received one complaint in the reporting period.

Date	Type	Tenant	Precinct	Root cause	Action
29/11/2022	Cloudy water	Mondial VGL	Port Gate	Since the water meter has been replaced on Saturday the 26th Nov, the water coming from the kitchen tap and the water fountain in the warehouse is all coming out murky	Contractor advised he was unable to flush the domestic line after the installation as all taps were within the property and he did not have access, he could only do the fire hoses. Please open the kitchen tap and any other tap that is releasing murky water and let them run

	for 15-20 mins to flush the line out The murkiness is most likely air in the line, so should resolve after being flushed. Murkiness resolved after above actions were taken.

DWQMP Review and Audit

DWQMP Review

A review of the DWQMP was undertaken in 2016 with the revised document submitted to the Regulator for approval in November 2016. A number of changes were made to the document. A new monitoring location (Pinkenba kitchen) was added to capture the provision of water on the northern side of the river. The BMT kitchen location was removed. An application for approval of another revision (addressing the requirements of an Information Requirement Notice and a Further Information Request received in response to PBPL's 2016 application for amendment of the plan) was approved by DEWS in January 2018. A further review of the DWQMP was undertaken in October 2020 and approved by DRDMW in June 2021. A new monitoring location was added at the Brisbane International Cruise Terminal in June 2022 to capture the provision of water at the new facility and a minor amendment approved by DRDMW. The last review of DWQMP was carried out in October 2022 and approved by regulator in November 2022 including minor amendments as follows:

- The wording Queensland Urban Utilities and in brackets (QUU) is replaced with Urban Utilities (UU) throughout the whole plan.
- The wording and abbreviation of Department of Natural Resources Mines and Energy (DNRME) is replaced with Department of Regional Development, Manufacturing and Water (DRDMW) throughout the whole plan.
- Other minor changes made to correct wording in the DWQMP and make other changes that are not a change of substance and does not adversely impact upon the quality of water supplied and risk profile.

DWQMP Audit

An audit of the DWQMP was undertaken in March 2020. There have been no further external audits.

Customer service standards review outcomes

PBPL customer service standards were reviewed in October 2022. Water quality service standards remained intact however, a number of changes were made to the document as set out below:

Water Service Reliability

Service standard has changed from "less than or equal to 3 unplanned water or sewerage service interruptions within each precinct, each year" to "less than or equal to 12 unplanned water service interruptions per year".

Water Flow

Title has changed to Water Flow/Pressure.
Service standard has amended from "Maintain water flow to within 90% of the rate it is supplied at the head meter for each precinct being Fisherman Island, Port Gate and Port West" to "Maintain water pressure not less than 22 meters head of water in all areas"

Appendix-Quarterly monitoring results

YEAR			2022												2023											
MONTH			September						December						March						June					
Analyte	Unit	ADWG Health Guideline	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pinkenba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pinkenba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
pH	pH Unit	**6.5-8.5**	7.91	7.49	7.95	8.1	8.06	8.07	7.87	7.95	7.91	8.14	8.07	8.04	7.58	7.3	7.53	7.73	7.56	7.43	7.64	7.73	7.7	8.01	7.7	7.87
TDS	mg/L	-	239	223	238	244	235	290	388	386	391	386	379	358	298	231	288	298	286	277	285	298	292	308	283	286
Colour (True)	PCU	-	2	2	2	2	2	2	5	2	2	2	2	2	2	5	2	2	5	2	2	2	2	2	2	2
Turbidity	NTU	**5**	2.4	0.1	0.1	0.2	0.2	0.2	2.2	0.2	0.2	0.1	0.2	0.3	<0.1	3.4	0.1	0.1	0.3	0.2	0.4	0.1	0.2	0.1	0.2	0.2
Total Hardness as CaCO3	mg/L	-	95	80	87	105	92	128	172	181	176	184	184	180	138	110	132	145	140	126	142	138	144	148	145	138
Hydroxide Alkalinity as CaCO3	mg/L	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	mg/L	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	-	68	65	61	78	72	83	113	120	117	125	122	116	82	68	82	89	82	80	104	98	97	108	96	97
Total Alkalinity as CaCO3	mg/L	-	68	65	61	78	72	83	113	120	117	125	122	116	82	68	82	89	82	80	104	98	97	108	96	97
Sulfate as SO4	mg/L	**500**	47	48	55	46	54	56	69	70	70	67	60	57	47	40	48	47	48	47	37	38	39	39	38	38
Chloride	mg/L	**250**	54	46	47	51	45	72	84	89	84	84	86	94	58	43	58	60	69	55	66	63	64	69	66	66
Dissolved Major Cations																										
Calcium	mg/L	-	20	17	20	24	22	28	39	41	39	44	44	36	32	26	30	35	33	29	34	32	33	36	35	32
Magnesium	mg/L	-	11	9	9	11	9	14	18	19	19	18	18	22	14	11	14	14	14	13	14	14	15	14	14	14
Sodium	mg/L	-	42	38	39	41	40	48	53	54	52	53	53	62	45	38	45	46	46	43	40	41	39	42	38	39
Potassium	mg/L	-	3	3	3	3	3	3	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3
Dissolved Metals																										
Aluminium	mg/L	-	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.02	0.04	0.05	0.04	0.03	0.02	0.02	0.02	0.03	0.06	0.02
Antimony	mg/L	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	**0.01**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	**2**	0.02	0.016	0.018	0.019	0.014	0.024	0.033	0.036	0.033	0.043	0.035	0.029	0.027	0.022	0.028	0.036	0.029	0.025	0.026	0.026	0.026	0.03	0.024	0.025

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Analyte	Unit	ADWG Health Guideline	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pinkenba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pinkenba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
Cadmium	mg/L	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	**2**	0.113	0.113	0.033	0.004	0.024	0.596	0.195	0.122	0.029	0.008	0.051	0.28	0.198	0.286	0.06	0.008	0.028	0.152	0.199	0.12	0.05	0.005	0.029	0.04
Lead	mg/L	**0.01**	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	**0.5**	0.006	<0.001	0.002	<0.001	<0.001	0.003	0.009	<0.001	0.002	<0.001	0.001	0.002	<0.001	0.011	0.002	<0.001	<0.001	0.002	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	**0.02**	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	mg/L	**0.1**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	-	0.124	0.013	0.009	0.006	<0.005	0.162	0.296	0.013	0.008	0.01	<0.005	0.028	0.019	0.307	0.018	0.007	0.014	0.023	0.51	0.014	0.011	0.006	0.01	0.008
Boron	mg/L	**4**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	mg/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.3	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Metals																										
Aluminium	mg/L	-	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.05	0.04	0.03	0.03	0.04	0.03	0.04	0.08	0.05	0.03	0.03	0.02	0.02	0.04	0.02	0.03
Antimony	mg/L	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	**0.01**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	**2**	0.022	0.02	0.021	0.024	0.019	0.026	0.032	0.034	0.032	0.042	0.034	0.032	0.027	0.022	0.028	0.036	0.029	0.025	0.026	0.026	0.026	0.034	0.027	0.027
Cadmium	mg/L	**0.002**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	**2**	0.246	0.143	0.035	0.007	0.033	0.635	0.265	0.142	0.03	0.009	0.054	0.287	0.198	0.286	0.06	0.008	0.028	0.158	0.263	0.162	0.057	0.007	0.03	0.04
Lead	mg/L	**0.01**	0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	**0.5**	0.009	0.001	0.002	0.001	0.001	0.004	0.01	0.002	0.004	0.001	0.002	0.004	<0.001	0.011	0.002	<0.001	0.007	0.002	0.005	<0.001	0.002	<0.001	0.002	0.003
Molybdenum	mg/L	**0.05**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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Nickel	mg/L	**0.02**	<0.001	<0.001	<0.001	<0.001	0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	**0.01**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	mg/L	**0.1**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	mg/L	-	0.131	0.018	0.009	0.008	<0.005	0.149	0.29	0.013	0.008	0.008	<0.005	0.033	0.019	0.307	0.018	0.007	0.014	0.036	0.517	0.018	0.012	0.006	0.02	0.007
Boron	mg/L	**4**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	mg/L	-	0.34	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.3	<0.05	0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Mercury	mg/L		<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.0001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001
Total Cyanide	mg/L		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004						<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Fluoride	mg/L	**1.5**	0.8	0.8	0.8	0.8	0.8	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	0.7	0.8	0.7	0.8	0.7	0.5	0.7	0.8	0.4	0.6	0.8
Ammonia	mg/L	-	0.03	0.03	0.12	<0.01	0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.02	<0.01	0.01	<0.01	<0.01	0.04	0.09	0.05	0.1	<0.01	<0.01	0.03
Nitrite	mg/L	**3**	<0.01	0.01	0.14	<0.01	0.01	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	0.02	<0.01	<0.01	0.05	<0.01	0.03	0.55	0.03	<0.01	0.16	<0.01	0.06	0.3
Nitrate	mg/L	**50**	0.62	0.72	0.48	0.83	0.8	0.4	0.53	0.66	0.57	0.78	0.7	0.52	0.67	0.54	0.67	0.84	0.74	0.55	0.33	0.56	0.38	0.67	0.54	0.26
Nitrite and Nitrate as N	mg/L	-	0.62	0.73	0.62	0.83	0.81	0.4	0.53	0.66	0.66	0.78	0.7	0.54	0.67	0.54	0.72	0.84	0.77	0.61	0.36	0.56	0.54	0.67	0.6	0.56
Sulfide as S2	mg/L	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Monocyclic Aromatic Hydrocarbons																										
Benzene	µg/L	**1**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L	**800**	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Ethylbenzene	µg/L	**300**	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	µg/L	**600**	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Styrene	µg/L	**30**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
ortho-Xylene	µg/L	**600**	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Isopropylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
n-Propylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.3.5-Trimethylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

YEAR			2022												2023											
MONTH			September						December						March						June					
Analyte	Unit	ADWG Health Guideline	Pink enba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pink enba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pink enba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pink enba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
sec-Butylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2.4-Trimethylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
tert-Butylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
p-Isopropyltoluene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
n-Butylbenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Butanone (MEK)	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Methyl-2-pentanone (MIBK)	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Hexanone (MBK)	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Carbon disulfide	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2.2-Dichloropropane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2-Dichloropropane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
cis-1.3-Dichloropropylene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
trans-1.3-Dichloropropylene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2-Dibromoethane (EDB)	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Halogenated Aliphatic Compounds																										
Dichlorodifluoromethane	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Chloromethane	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Vinyl chloride	µg/L	0.3	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Bromomethane	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Chloroethane	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Trichlorofluoromethane	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
1.1-Dichloroethene	µg/L	30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

YEAR			2022												2023											
MONTH			September						December						March						June					
Analyte	Unit	ADWG Health Guideline	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pinkenba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pinkenba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
Iodomethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
trans-1.2-Dichloroethene	µg/L	60	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1-Dichloroethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
cis-1.2-Dichloroethene	µg/L	30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1.1-Trichloroethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1-Dichloropropylene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon Tetrachloride	µg/L	3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2-Dichloroethane	µg/L	3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dibromomethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1.2-Trichloroethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.3-Dichloropropane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	µg/L	50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1.1.2-Tetrachloroethane	µg/L	50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
trans-1.4-Dichloro-2-butene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
cis-1.4-Dichloro-2-butene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.1.2.2-Tetrachloroethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2.3-Trichloropropane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Pentachloroethane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2-Dibromo-3-chloropropane	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Hexachlorobutadiene	µg/L	0.7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

YEAR			2022												2023											
MONTH			September						December						March						June					
Analyte	Unit	ADWG Health Guideline	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pinkenba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pinkenba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
Halogenated Aromatic Compounds																										
Chlorobenzene	µg/L	**300**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromobenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Chlorotoluene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4-Chlorotoluene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.3-Dichlorobenzene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.4-Dichlorobenzene	µg/L	**40**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2-Dichlorobenzene	µg/L	**1500**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2.4-Trichlorobenzene	µg/L	**30**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1.2.3-Trichlorobenzene	µg/L	**30**	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trihalomethanes																										
Chloroform	µg/L	**250**	26	28	28	30	24	15	29	30	29	32	25	18	31	27	27	28	28	27	17	16	16	18	14	14
Bromodichloromethane	µg/L	**250**	20	16	21	<5	15	16	25	14	33	<5	23	22	17	18	28	<5	26	21	21	15	20	<5	18	18
Dibromochloromethane	µg/L	**250**	10	6	10	<5	<5	12	19	11	30	<5	11	28	<5	11	20	<5	17	16	17	13	19	<5	12	18
Bromoform	µg/L	**250**	<5	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Naphthalene	µg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
VOC Surrogates																										
1.2-Dichloroethane-D4	%	-	93.5	95.8	97.4	96	92.6	95.9	99	97.4	98.6	98	99.4	92.9	91.7	93.4	92.1	91.3	94.9	94.8	105	106	108	106	101	108
Toluene-D8	%	-	102	102	104	105	106	106	104	105	103	105	104	102	99	102	102	102	100	104	107	105	103	105	103	103
4-Bromofluorobenzene	%	-	95	96.9	99.5	99.2	101	102	105	102	102	104	101	99.5	98.9	106	104	102	104	101	98.2	110	100	102	99.7	98.7
Total Petroleum Hydrocarbons																										
C6 - C9 Fraction	µg/L	-	40	30	40	30	30	30	40	30	40	20	30	50	30	30	40	20	40	40	30	20	30	<20	20	20
C10 - C14 Fraction	µg/L	-	<50	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

YEAR			2022												2023											
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Analyte	Unit	ADWG Health Guideline	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	Pinkenba kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal	NPO Ground Floor Bathroom	Pinkenba Kitchen	Port West Warehouse	Reclamation	Tea Room Maintenance Building	BICT	Pinkenba Kitchen	NPO Ground Floor Bathroom	Port West Warehouse	Reclamation	Tea Room Maintenance Building	International Terminal
C29 - C36 Fraction	µg/L	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	-	<50	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	<50	<50	<50
Heterotrophic Plate Count (22°C)	CFU/mL	-	49	160	<1	63	40	140	140	57	13	78	38	110	39	91	11	17	~4	150	1300	110	<1	25	~4	~4
Heterotrophic Plate Count (36°C)	CFU/mL	-	260	100	<1	110	31	230	430	~1200	32	150	35	540	61	100	33	25	11	190	~6700	150	23	36	~5	~7
Faecal Coliforms	CFU/100mL	**nil**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Escherichia coli	CFU/100mL	**nil**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Coliforms	CFU/100mL	-	<1	<1	<1	<1	<1	<1	<1	53	<1	46	<1	<1	95	<1	<1	~8	<1	<1	<1	83	<1	38	<1	<1
Total Chlorine	mg/L	**5**													0.03	0.02	0.08	~0.01	0.07	<0.01	----	0.04	0.36	0.05	----	0.16

Parameters tested with ADWG health guideline value color-coded.

Within ADWG health guideline value

Exceedance of ADWG health guideline value

Limit of reporting for the standard method testing of Vinyl chloride didn't comply with ADWG health limit. It was communicated with ALS lab and was corrected as of December 2023 sampling round.