麥寮工業區專用港管理股份有限公司
MAI LIAO HARBOR ADMINISTRATION CORPORATION

經濟部
產業園區管理局
Bureau of Industrial Parks
Ministry of Economic Affairs

國立成功大學水工試驗所
Tainan Hydraulics Laboratory, National Cheng Kung University

環興科技股份有限公司
SINOTECH ENGINEERING SERVICES, LTD.

Mailiao Industrial Harbor Environmental Report 2023

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2023

Contents

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Mailiao Industrial Harbor Environmental Report

This environmental report presents Mailiao Harbor’ s achievements in environmental protection from 2021 to 2022 as well as the environmental policy, commitments and action plans of the Mailiao Harbor Administration Corporation.

If you have any inquiries regarding this report, please contact us.

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01 Mailiao Harbor Environmental Policy

Mailiao Harbor Environmental Policies

Mailiao Harbor Administration Corporation firmly believes that environmental protection is as important as economic development of the harbor. As the administrative entity of the Mailiao Harbor, we take on the responsibility of protecting the environment and the safety of our employees. We strive to achieve our environmental goals by providing sufficient training and assuring the compliance of relevant regulations by all stakeholders.

The following principles are promoted to ensure the conformity of our environmental performance and government policies.

Comply with Environmental Regulations, Dedicate to Eco-Friendly Actions.

Proceed with Environmental Monitoring, Maintain Cleanness of the Harbor.

Environmental Education and Training, Heighten Environmental Awareness.

Safety and Environment Management, Achieve Sustainable Development.

The following objectives have been established to tackle the top 10 major harbor environmental issues. The environmental policies need to be reviewed annually to improve our actions and fulfill our commitment to environmental protection. In addition, all staffs working in the harbor, ship companies and local residents should be informed of these environmental policies. At the same time, the environmental policies are announced on our official website.

1. **Improve Air Quality in Harbor.**
   Supply Alternative Maritime Power. Only low-sulfur fuel is allowed in harbor. Enforcing boats to travel at a lower velocity. Promoting green transportation. Setting up gas recycling system. Reduction of Air pollutant emission.
2. **Climate Change Adaptation and Mitigation**
   Establishing wave observation systems to enhance potential risk detection and reduce the impact on the port. Periodic inventory of greenhouse gases to grasp the carbon emissions status of Mailiao Harbor and promote carbon reductions.
3. **Transforming Green Energy Efficiency**
   Creating a green office environment (including replacing energy-efficient lighting and creating a paperless office environment) and implementing green energy policies (including promoting solar energy green power supply and implementing rainwater harvesting projects).
4. **Maintaining Water Quality.**
   Develop ocean pollution prevention and emergency plan. Regular water quality monitoring. Improve marine pollution identification and reporting mechanism.
5. **Strengthen Dredging and Dumping Management**:
   Make the dredging and dumping plan according to EIA promise. Monitoring the water quality during dredging and dumping process.
6. **Waste Management**.
   Enforce recycling on docked ships and office buildings. Encourage waste reduction and recycling.
7. **Wastewater Discharge Prohibition.**
   Prohibit wastewater discharge from all vessels in port. Launching wastewater collection services. Integrate harbor inspection with law enforcement units.
8. **Marine Habitat Protection:**
   Implement regular water quality monitoring and ecological survey in harbor vicinity. Banning fishing to maintain marine habitat.
9. **Strict Management of Dangerous Cargo.**
   Establish the regulations governing dangerous goods loading and unloading at Mailiao Harbor administration. Deploying oil boom to prevent leaking oil from spreading. Setting up alarm and detection systems. Employing GasFindIR and professional decontamination vessels. Reinforce emergency drills.
10. **Careful Attention to Ship Refueling Procedures.**
    Introduction of vessel refueling operation procedures to protect both the environment and workers' safety.

Chairman of Mailiao Harbor Administration Corporation CHEN BAO-LANG

02 Message from the Chairman

A Word from the Chairman of the Board

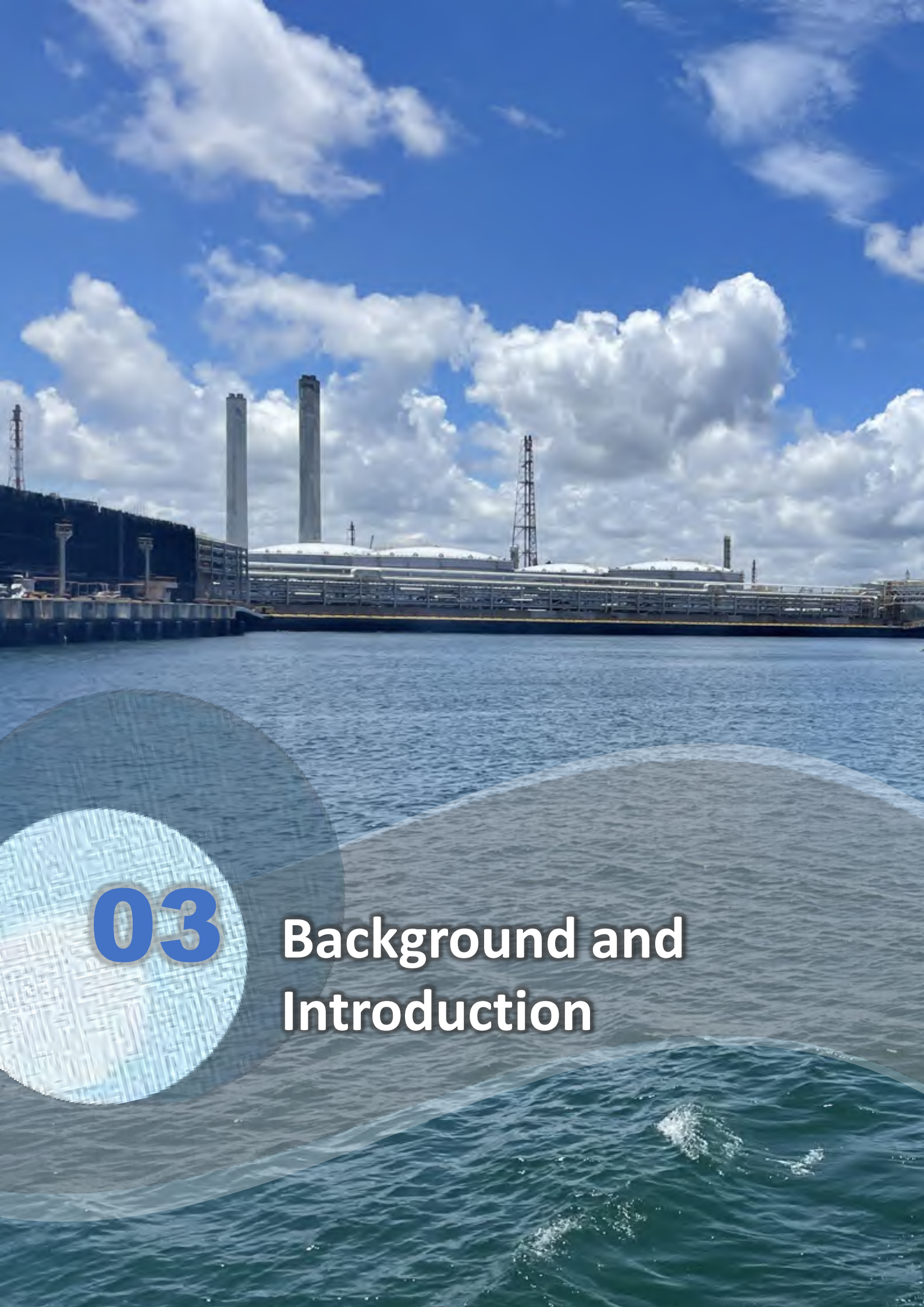
Amidst continual development of the global shipping industry, port operations will have a devastating effect on the environment if relevant protection measures are disregarded. In recent years, the concept of "EcoPorts" has received the attention of major international ports, including those in Europe and North America. The Mailiao Harbor in Taiwan has also focused on this concept since its opening, upholding equal emphasis on environment preservation and industrial development, to ensure sustainable development.

The Mailiao Harbor is Taiwan's largest industrial port and a pioneer in promoting environmental protection, where the harbor leads by example. The harbor possesses complete environment management policies, monitors all of its operations via strict management and control, and implements environmentally friendly and ecological protection-oriented measures, maintaining clean water surrounding the harbor and a wealth of terrain and marine ecological resources.

Regardless of various focuses on transportation development for port operations, green transportation has undoubtedly become the basic foundation in response to the development trend of global shipping industry. The Mailiao Harbor operates in a cautious and conscientious manner, complies with applicable environmental policies strictly, and engages in environmentally friendly endeavors. In addition, it implements relevant plans, performs reviews persistently, and refines and improves its plans to ensure the adequate execution of its policies and goals. In the future, the harbor will continue to elevate its operating performance and port service quality as well as apply for the European Union EcoPorts Certification to facilitate international exchanges and learning, transforming into a green port that saves energy, reduces carbon, emits minimal pollution, and practices environmental protection.

Chairman of Mailiao Harbor Administration Corporation

Bao-Lang CHEN



03 Background and Introduction

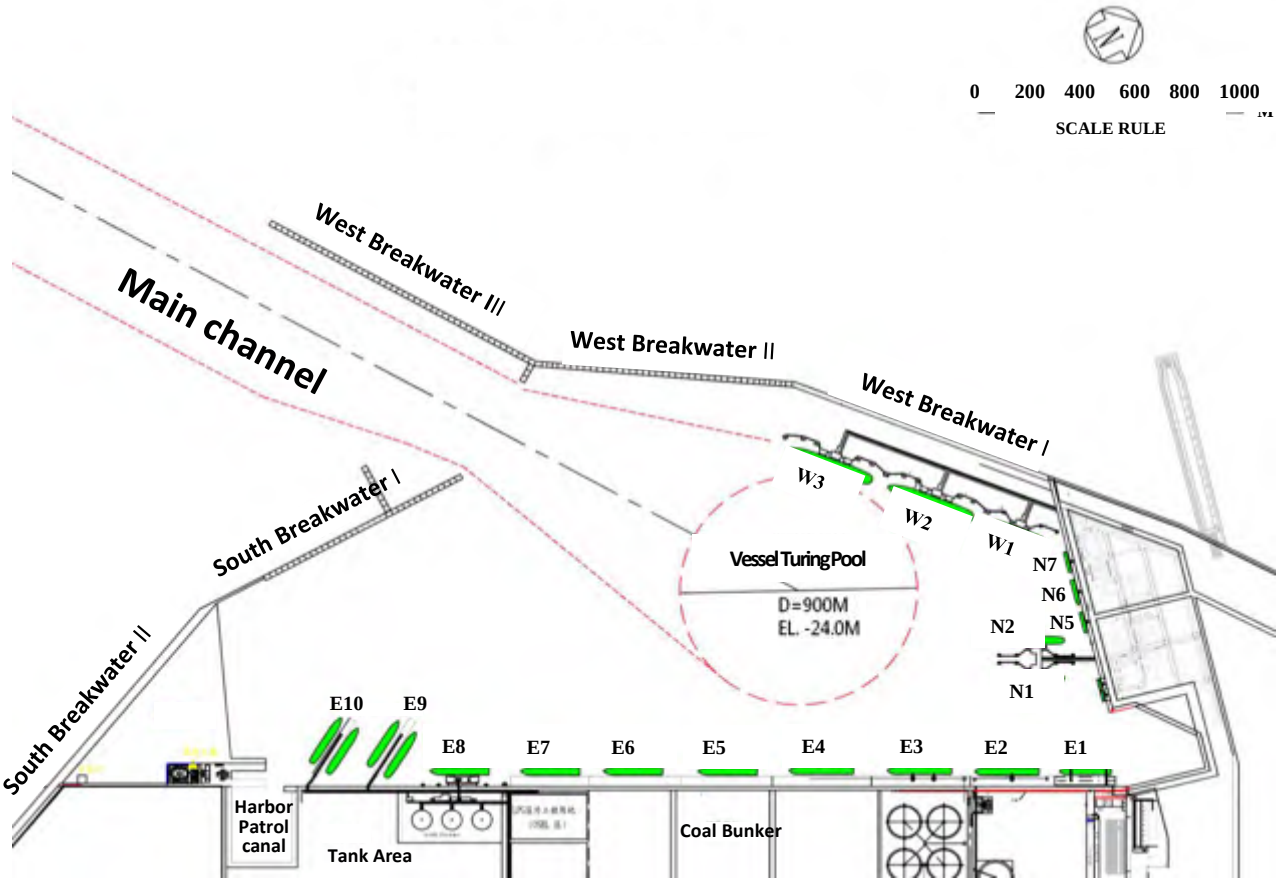

FPMC

Introduction

Mailiao Industrial Harbor (hereinafter referred to as Mailiao Harbor) is located in the Mailiao area of the Yunlin Offshore Industrial Zone, Taiwan. The Yunlin Offshore Industrial Zone was developed by the Ministry of Economic Affairs to enhance basic industries in our country. Yunlin Offshore Industrial Zone is planned to provide the land needed for the expansion project of Mailiao Industrial Park; it is expected to meet current and future needs of the petrochemical industry for plant construction and relocation. The plan included extracting sand from the sea areas near Yunlin County for landfilling, to create land for the development of the Yunlin Offshore Industrial Zone. The industrial zone was divided into the Mailiao, Hsin Hsing, Taixi, and Sihu zones; the land area of the petrochemical industrial zone in the Mailiao zone was created by the Formosa Plastics Group by landfilling; and the appropriated berths in the Mailiao Harbor were built for the use of the Mailiao Industrial Zone. The Executive Yuan approved the construction of Mailiao Harbor on July 7, 1993. The harbor officially began operations on March 1, 2001.

Mailiao Harbor is located at the central point of Taiwan's west coast (120°08.9' E, 23°46.9' N). Situated in the Yunlin Offshore Industrial Zone, Mailiao Harbor is the first international harbor in Taiwan funded and built by nongovernmental corporates. To the north lies the south bank of the Zhuoshui River Estuary; to the south lies the Hsinhuwei River Estuary; and to the west is the Penghu Channel. The Port of Taichung and the Port of Keelung is approximately 40 and 150 nautical miles north of the harbor, respectively; and the Port of Kaohsiung is about 80 nautical miles south of the harbor. The harbor entry faces west with a 34° angle to the south (between west-south-west and south-west), and the waterway at mid-tide is 24 m deep. It is the deepest harbor in Taiwan, capable to accommodate a 300,000-ton vessel.

Location of the Appropriated Berths in the Mailiao Harbor



Status of Mailiao Harbor

Item	Information
Harbor	Faces west with a 34° angle to the south; water depth EL-24 m; width 390 m
Entering/exiting channels	Channel length approximately 2,500 m; water depth 24 m at mid-tide
Vessel turning pool	Diameter 900 m
Berth	Supporting 20 appropriated berths
Harbor patrol canal	For mooring, water refilling, and refueling of harbor craft boats
Factory and repairing slipway	For repair, inspection, and maintenance of harbor craft boats
Harbor area	A total area of 1599.15 ha; interior harbor area 476 ha; terrestrial area 179.15 ha; exterior harbor water area 944 ha
Breakwater	West breakwater 3,243 m; south breakwater 2,227 m

Primary Commercial Activities

Operations statistics of Mailiao Harbor in 2021 and 2022

Item		2021 (a)	2022 (b)	Annual business comparison (b-a)	
				Actual number	%
Incoming and outgoing vessels	No. of incoming vessels (vessel)	2,252	2,091	-161	-7.15%
	Gross tonnage of import (ton)	53,210,341	53,570,501	360,160	0.68%
	No. of outgoing vessels (vessel)	2,242	2,102	-140	-6.24%
	Gross tonnage of export (ton)	53,016,853	53,600,101	583,248	1.10%
Cargo throughput	Tonnage of imports (metric ton)	45,556,430	44,485,268	-1,071,162	-2.35%
	Tonnage of exports (metric ton)	19,056,831	2,031,309	-17,025,522	-89.34%
	Tonnage of imports and exports (metric ton)	64,613,261	64,795,577	182,316	0.28%
Loading/ unloading volume	Total (metric ton)	64,864,877	64,750,493	-114,384	-0.18%

Main Cargo

Incoming and outgoing goods at Mailiao Harbor are primarily oil-based products, followed by chemicals, ores, and dry bulk cargo of related industrial goods.

Primary goods in Mailiao Harbor

Petroleum
Crude oil LPG (Liquefied petroleum gas) Refined oil
Pyrites minerals/Ores
Coal Sulphur
Chemicals
Sodium hydroxide Ethylene Glycol
Dry bulk
Coke Industrial salt

Key Initiatives Promoted in these Years

Mailiao Harbor has been dedicated to promoting green energy in response to energy transition policies.

Key Projects	Execution Focus
Shore Power System	• In addition to the seven low-voltage AMP facilities used by harbor tugboats, the newly operational high-voltage AMP facility (6.6kV/1800kW) at Dock 3 East can serve 200,000-ton bulk carriers and coal ships. Incentive measures are provided; ships that use high-voltage shore power while docked are exempt from usage and electricity fees, contributing to air pollution reduction and carbon credit acquisition.
Tugboat Renewal	• To support the renewal of harbor tugboats, Mailiao Harbor has replaced seven tugboats in recent years, including four 5,000-horsepower and three 2,400-horsepower tugboats. This renewal has effectively enhanced tugboat operation efficiency, improved towing service quality, and strengthened port firefighting safety.
Green Energy and Carbon Reduction	• **Implementing green energy policies and promoting a green office** environment**:** 1. Three 20-ton rainwater recycling tanks have been installed in the harbor office building, improving rainwater storage efficiency and promoting sustainable water resource utilization. 2. A 35-item green office checklist has been established to ensure practical implementation, covering temperature control for air conditioning, energy-efficient lighting, water-saving facilities, paperless office initiatives, waste sorting and recycling, transitioning to electric vehicles for official use, and organizing environmental knowledge training and seminars. 3. Solar-powered navigation beacons and lights have been installed in the harbor area. Additionally, solar panels are planned for the harbor parking lot, with an estimated capacity of 241.76 kWp.
Climate Change Adaptation	• **Strengthening climate change adaptation capabilities and assessing potential impact risks:** 1. Wave monitoring stations have been set up at North Docks 2 and 5, using wave gauges to monitor port conditions in real-time, aiding ship operations and cargo handling personnel in disaster prevention. 2. In response to rising sea levels due to severe climate change, improvements have been made to elevate the deck panels at the harbor tugboat docks, mitigating the impact of seawater flooding caused by heavy rain and storm surges. 3. Regular greenhouse gas emission inventories are conducted in the harbor area, aligning with Formosa Plastics Group's goal to reduce carbon emissions by 2050, based on 2018 levels, and continuing to plan and implement carbon reduction initiatives.

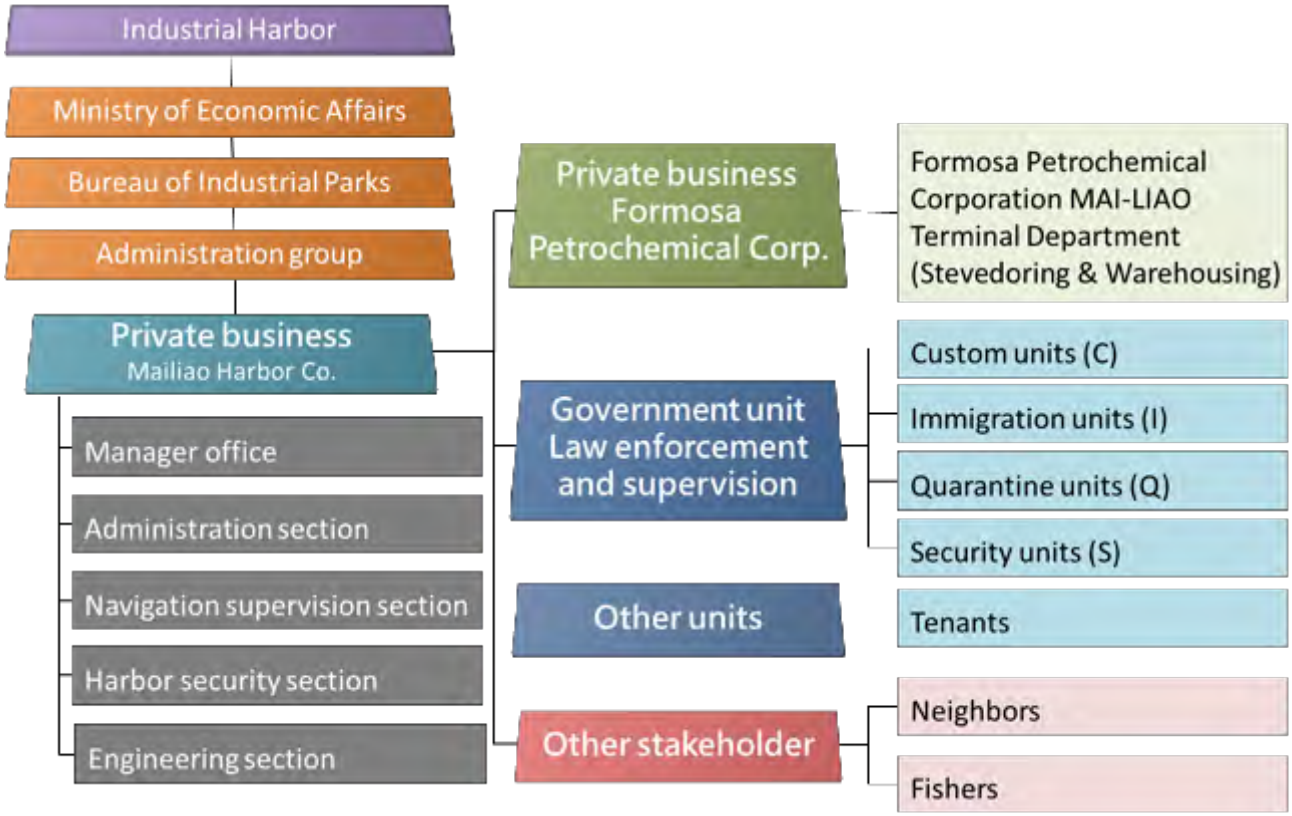
04 Environmental Management System

Organizational Structure and Explanations

The environmental preservation of Mailiao Harbor is the responsibility of the Mailiao Harbor Administration Corporation (hereinafter referred to as the "MHAC"), primary stakeholders, secondary stakeholders, and other stakeholders. The primary stakeholder in this case is the Formosa Petrochemical Corporation MAI-LIAO Terminal Department. Secondary stakeholders can be divided into government units and other units. Government units are customs units (e.g., the Customs Administration, Ministry of Finance, Taichung Customs Business Group 2, Mailiao Business Division), immigration units (e.g., Mailiao Branch, Taichung Port Brigade, Border Affairs Corps, National Immigration Agency, Ministry of the Interior), quarantine units (e.g., the Mailiao Harbor Office, Southern Region Control Center, Taiwan Centers for Disease Control), and security units (e.g., Mailiao Industry Harbor Security Office, Fourth Coastal Guard, Central Branch, Coast Guard Administration, and Ocean Affairs Council). Other units are harbor tenants. Other stakeholders are fishers and neighbors.

The MHAC operates and manages Mailiao Harbor, whereas the management team exercises governmental authority. The customs unit, immigration unit, quarantine unit, security unit, and tenants cooperate with administrative management personnel.

Organizational Structure of Mailiao Harbor Operations



The MHAC is committed to environmental management in Mailiao Harbor. In order to smoothly carry out various management operations, the port company evaluates the stakeholders based on the implemented management actions and orientations, and truly understands their needs and expectations. This forms the basis for considering the promotion of port environmental management. In addition, the MHAC also establishes effective communication bridges with stakeholders through regular coordination meetings, communication groups, harbor visiting , advocacy activities, publication of green port promotion achievements, publication of environmental report, and responding to feedback in the official email.

The needs and expectations of the stakeholders of Mailiao Harbor

Stakeholders	Needs and Expectations	engagement of stakeholders with the environmental port activities
[Primary stakeholder]		
1. Private business Formosa Petrochemical Corp.	• Reduce or contain the environmental impact at the harbor ✓ Energy and resource consumption ✓ General waste recycling rate	• The regular meeting of the industrial safety and the environmental protection every month • Harbor visiting for the employee and their family • The coordination meeting for Eco-ports every quarter
[Secondary stakeholder]		
2. Custom units	• Government unit Law enforcement and supervision	• Stay connected via instant messaging (Line) • The regular meeting and activity: ✓ Stakeholder consultative meeting ✓ Training ✓ Advocacy
3. Immigration units		
4. Quarantine units		
5. Security units		
6. Tenants	• Good reputation, risk prevention	• The regular meeting with contractors every month
[Non-stakeholder]		
7. fishers and neighbors	• Environmental and Ecological Conservation ✓ Air quality ✓ Habitat/(marine) ecosystem	• Publications on Official Websites: environmental policy and the environmental report • Official email (jeff huang@fpcc.com.tw) • Contribute to the society: ✓ Call for large-scale beach cleaning ✓ Measures of fry releasing ✓ Conferences to promote Eco-ports ✓ Invitation to visit the harbor

The Mailiao Harbor Co. was jointly founded by industrialists within the industrial zone. On May 2, 1995, the Industrial Development Bureau of the Ministry of Economic Affairs approved the funding, construction, and operation of Mailiao Industrial Harbor by the Mailiao Harbor Co.

The operational goal of the Mailiao Harbor Co. was to provide prompt and convenient port functions to reduce the freight and warehousing costs for businesses, enhance industrial competitiveness, and stimulate the economy. Thus, simplicity and efficiency are the foremost considerations of the organization. The internal organizations of the Mailiao Harbor Co. include the port engineering, port security, port traffic control, and administration sections. The stevedoring operations at the wharves are managed by the Formosa Petrochemical Terminal Department. The responsibilities of the various organizational units are as follows.

Administration section

- Manage and implement business operations, and collect harbor fees.

Port traffic control section

- Monitor vessels entering and exiting the harbor, allocate berths, and dispatch boats for harbor patrol.

Port security section

- Maintain security in the harbor area and maintain environmental cleanliness.

Port engineering section

- Manage harbor area constructions and maintain harbor facilities.

Formosa Petrochemical Corporation MAI-LIAO Terminal Department

- Perform stevedoring of incoming and outgoing cargo at the wharves.

Regulations Governing Environmental Protection

The Mailiao Harbor Co. follows relevant international regulations and conventions, including the International Convention for the Prevention of Pollution From Ships (MARPOL 73/78), the London Convention (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter), the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), and the International Convention for the Control and Management of Ships' Ballast Water and Sediments.

The Mailiao Harbor Co. follows relevant national regulations and environmental management practices, which are as follows:

National environmental regulations governing Mailiao Harbor

Type of laws	Regulation name/s	Central authority	Local authority
Laws related to harbor construction	Statute for Industrial Innovation	Industrial Development Administration Ministry of Economic Affairs	Yunlin County Government
	Regulations Governing Administration of Reuse of Enterprise Waste		Environmental Protection Bureau, Yunlin County
Laws governing transportation departments	The Law of Ships	Maritime Port Bureau, Ministry of Transportation and Communications	Mailiao Harbor Office
	The Commercial Port Law		
	Shipping Act		
Laws governing interior departments	Fire Services Act	National Fire Agency, Ministry of the Interior	Fire Department, Yunlin County
Laws governing agricultural departments	Wildlife Conservation Act	Council of Agriculture, Executive Yuan	Agriculture Bureau, Yunlin County
Laws governing environmental protection departments	Marine Pollution Control Act	Ocean Affairs Council	
	Basic Environment Act	Ministry of Environment	Environmental Protection Bureau, Yunlin County
	Air Pollution Control Act		
	Water Pollution Control Act		
	Waste Disposal Act		
	Resource Recycling Act		
	Environmental Impact Assessment Act		
	The Environmental Education Act		
	Noise Control Act		
	Indoor Air Quality Act		
	Toxic and Concerned Chemical Substances Control Act		
	Soil and Groundwater Pollution Remediation Act		
	Climate Change Response Act		
	Public Nuisance Dispute Mediation Act		Public Nuisance Arbitration Committee, Yunlin County
Laws related to cross-departments	Disaster Prevention and Protection Act	Ministry of the Interior	Yunlin County Government (The competent authority or local units differ based on disaster type)

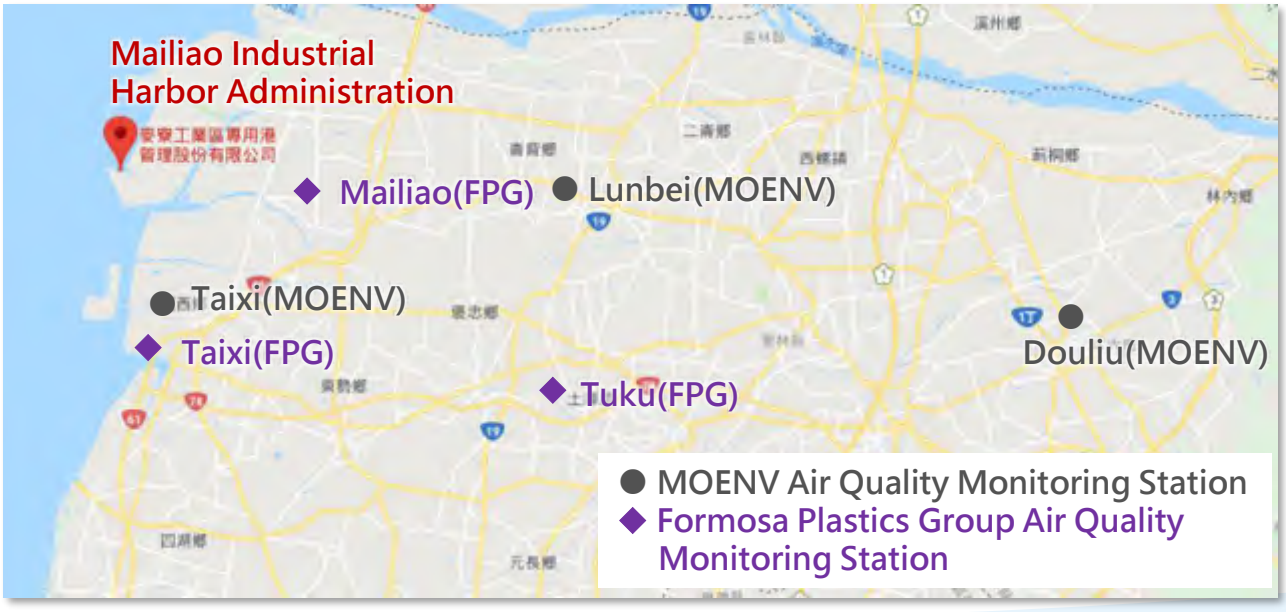
05 Environmental Status

Air Quality

The primary function of Mailiao Harbor is to service the Yunlin Offshore Industrial Zone. It has spared no effort in protecting overall air quality. In the Formosa Plastics Group Sixth Naphtha Cracking Complex, the implementation of "Environmental Monitoring of Sixth Naphtha" was based on the environmental monitoring plans included in the "Environmental Impact Statement of the 6th Naphtha Expansion Project" and the "Environmental Impact Report of the 6th Naphtha Expansion Project." The aforementioned Statement and Report were proposed by Formosa Plastics Group and approved by the Ministry of Environment (MOENV). Each quarter, the monitoring results are sent to the 6th Naphtha Environmental Monitoring Committee for review; if the monitoring data are abnormal, the Formosa Plastics Group proposes response measures and keeps track of the situation. The monitoring and data analysis results of each quarter are compiled into a monitoring report and sent to the MOENV; the complete report is published on the MOENV website.

The air quality monitoring stations of Mailiao Harbor and Formosa Plastics Group are joint setups of Mailiao Industrial Zone. The air quality data monitored over the years from the three nearby air quality auto-monitoring stations at Taixi (Taixi Junior High School), Tuku (Honglun Elementary School), and Mailiao (Mailiao Junior High School) that were set up by the Formosa Plastics Group, along with the data from the three nearby air quality monitoring stations at Douliu, Lunbei, and Taixi in Yunlin County set up by the MOENV, were also compiled. The locations of these air quality monitoring stations are illustrated in the following figure, and the air quality monitoring data are presented and explained in the following table:

Location of air quality monitoring stations near Mailiao Harbor



Mailiao Harbor is in the vicinity of six air quality monitoring stations; they monitor the levels of sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), suspended particulates with a particle size of 10 microns or less (PM_{10}), nitrogen dioxide (NO_2), and nonmethane hydrocarbons (NMHC). Except for carbon monoxide (CO) and non-methane hydrocarbons (NMHC), the concentrations of the rest of the items are far below the regulated standards.

Air quality monitoring results over the years

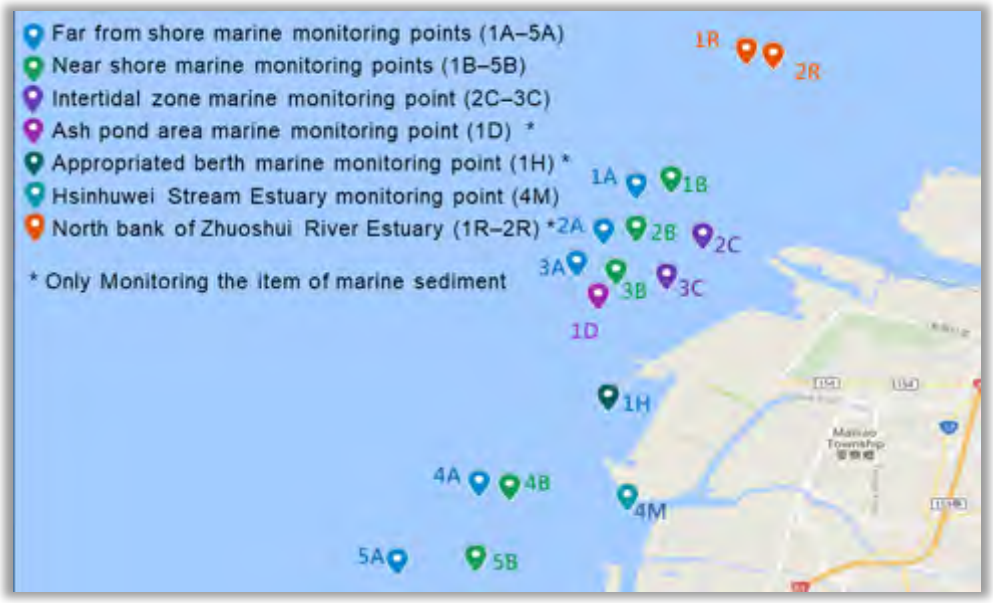
Monitored item (unit)			SO_2	CO	$O_{3,\,max}$	$O_{3,\,8hr}$	PM_{10}	NO_2	NMHC
Air quality standard (Applicable before 9/18/2020)			30	-	120	-	65	50	-
Air quality standard (Applicable starting 9/18/2020)			20	-	120	60	50	30	-
Type	Station	Year	ppb	ppm	ppb	ppb	$\mu g/m^3$	ppb	ppm
FPG monitoring stations	Mailiao	2020	2.37	0.40	50.90	44.30	43.82	9.26	0.06
	Taixi		2.33	0.38	53.32	46.98	34.95	8.32	0.05
	Tuku		2.32	0.41	54.32	46.20	42.12	9.70	0.10
	Mailiao	2021	2.34	0.34	49.12	42.90	45.03	9.03	0.05
	Taixi		2.30	0.34	53.42	46.78	37.71	9.30	0.05
	Tuku		2.27	0.37	52.86	44.97	46.47	9.16	0.06
	Mailiao	2022	2.23	0.33	53.10	46.69	39.18	7.64	0.04
	Taixi		2.07	0.32	52.52	46.51	31.06	7.25	0.03
	Tuku		2.30	0.35	53.51	45.55	35.22	8.34	0.05
MOENV monitoring stations	Lunbei	2020	2.18	0.28	54.63	46.48	41.70	8.73	-
	Taixi		2.20	0.23	54.77	48.16	34.90	7.12	0.03
	Douliu		2.25	0.32	65.62	53.40	39.30	9.90	-
	Lunbei	2021	2.14	0.25	52.35	43.84	43.40	8.48	-
	Taixi		2.17	0.21	54.36	46.57	35.30	7.22	-
	Douliu		2.36	0.30	61.53	49.58	40.90	9.17	-
	Lunbei	2022	1.50	0.24	50.46	42.89	35.50	6.51	-
	Taixi		1.57	0.22	52.06	45.75	30.10	5.34	0.03
	Douliu		1.62	0.28	59.49	47.87	35.80	8.33	-

- Note: "–" denotes no monitoring data or no air quality standar
- Data source: Environmental Impact Assessment supervision–Sixth Naphtha Environmental Monitoring data, MOENV, Executive Yuan (Environmental Monitoring Report for the "Offshore Industrial Zone Petrochemicals Industry Comprehensive Area Development Project," a subsidiary of Formosa Plastics Group) https://www.moenv.gov.tw/

Marine Sediment and Water Quality

The marine sediment monitoring points near Mailiao Harbor are situated in the sea area near the Mailiao Industrial Zone. A total of 17 monitoring points exist, and they are classified into far from shore (1A–5A), near shore (1B–5B), intertidal zone (2C–3C), ash pond area (1D), appropriated berths (1H), Hsinhuwei Stream Estuary (4M), and north bank of Zhuoshui River Estuary (1R–2R).

Marine sediment and water quality monitoring stations



Sediment

The monitored items are the heavy metals Cd, Cr, Cu, Ni, Pb, Zn, As, and Hg. During 2021 to 2022, all pollutants were below the lower threshold and quality test qualification rate was 100%.

The monitoring of heavy metals in the sediment of Mailiao Harbor revealed that, except for some gauging stations with Ni and As concentrations exceeding the lower threshold of sediment quality. However, the concentration of heavy metals in sediment is affected by several factors, such as the marine sedimentary environment, the sediment source, particle size, the amount of organic carbon, geochemical functions, and whether contamination exists (Luoma, 1990). According to the sediment research related to the Taiwan Strait, the Ni concentration in the sediment of the southwest coast of Taiwan was 16.2–95.2 mg/kg, exceeding the upper limit (Lee et al., 1998a). The Ni concentration in the ocean sediment in Kaohsiung and Pingtung ranged from 25 to 64 mg/kg; all concentrations in this range are below the lower limit. The concentration of As was 11.2–15.7 mg/kg (Hung, 2004 and 2009); this range exceeded the lower limit, revealing that the high concentrations of Ni and As in the sediment in the southwest ocean of Taiwan were the result of geological characteristics rather than harbor activities.

Sediment monitoring indices

Unit: mg/kg		Cd	Cr	Cu	Ni	Pb	Zn	As	Hg
Sediment Quality Guidelines	Lower limit	0.65	76.0	50.0	24.0	48.0	140	11.0	0.23
	Upper limit	2.49	233	157	80.0	161	384	33.0	0.87
Sediment Biohazard Guidelines (NOAA, U.S.)	Lower limit	1.2	81	34	20.9	46.7	150	8.2	0.15
	Upper limit	9.6	370	270	51.6	218	410	70	0.71

Sediment heavy metal concentration range of monitoring stations at the Mailiao sea area

	Cd (mg/kg)			Cr (mg/kg)			Cu (mg/kg)			Ni (mg/kg)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
2021Q1	0.02	0.05	0.03	13.48	33.25	18.69	3.39	17.00	5.54	14.00	23.40	16.80
2021Q2	0.002	0.15	0.06	14.17	55.15	21.55	4.11	30.70	7.45	7.38	22.10	14.40
2021Q3	0.02	0.09	0.05	14.25	35.31	21.64	4.53	19.80	7.87	12.90	23.20	16.60
2021Q4	0.04	0.09	0.07	11.40	39.48	20.64	4.35	18.80	8.16	5.50	21.70	12.50
2022Q1	0.03	0.13	0.06	13.40	49.01	23.03	4.23	29.70	7.97	8.20	22.90	14.70
2022Q2	0.03	0.12	0.07	15.84	37.61	21.51	4.52	19.90	8.09	13.00	21.60	15.80
2022Q3	0.02	0.13	0.05	13.32	50.94	20.85	4.49	29.50	8.01	13.20	22.90	17.00
2022Q4	0.05	0.09	0.07	11.80	56.87	24.25	3.54	17.80	7.51	11.50	22.70	17.00

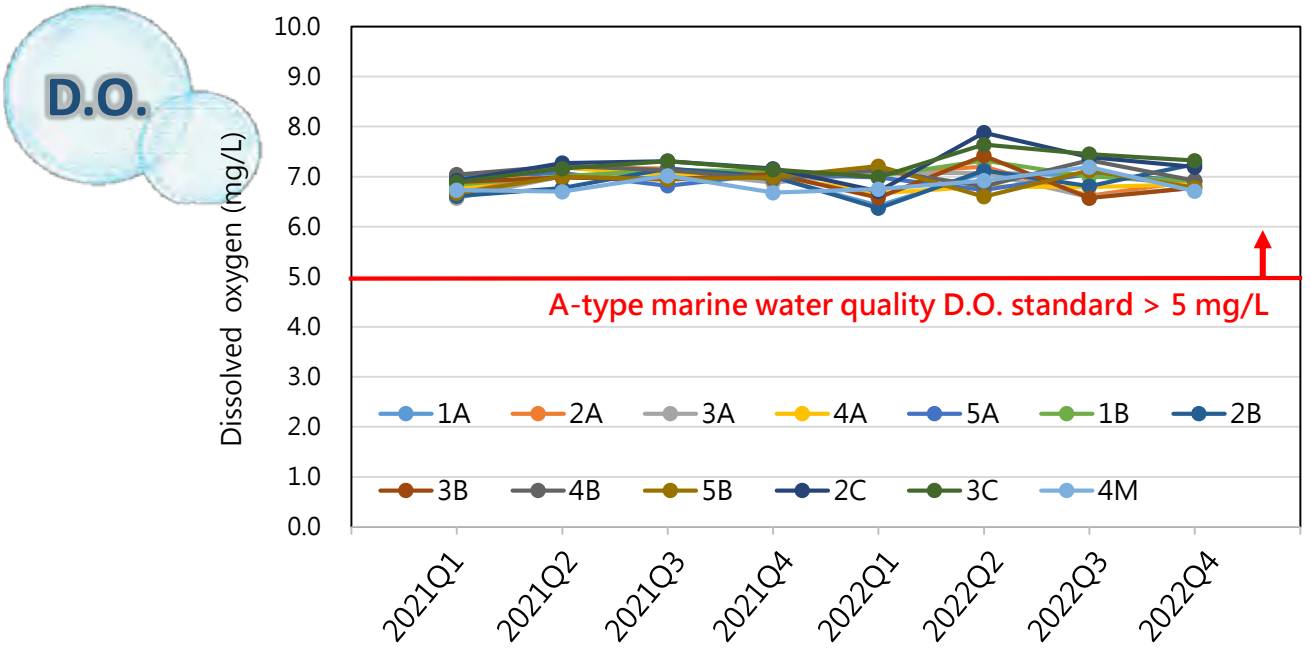
	Pb (mg/kg)			Zn (mg/kg)			As (mg/kg)			Hg (mg/kg)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
2021Q1	9.38	18.80	12.10	29.40	79.50	43.10	5.90	10.60	8.40	0.00	0.05	0.02
2021Q2	8.73	32.60	12.90	22.70	107.60	41.20	4.80	10.70	8.20	0.02	0.11	0.03
2021Q3	10.00	21.30	14.50	33.40	63.00	44.40	5.10	10.80	7.70	0.02	0.08	0.04
2021Q4	12.40	24.00	16.20	36.40	99.90	57.80	5.70	10.50	8.10	0.01	0.06	0.03
2022Q1	8.59	25.90	12.80	29.00	98.10	45.80	5.60	10.40	8.10	0.02	0.09	0.05
2022Q2	12.30	26.50	16.70	43.60	98.90	65.90	5.30	10.80	8.10	0.01	0.10	0.04
2022Q3	11.90	29.50	15.90	47.00	109.60	67.10	6.30	10.80	8.30	0.01	0.09	0.05
2022Q4	10.50	22.30	16.00	31.10	68.70	46.00	5.30	10.70	8.30	0.02	0.07	0.05

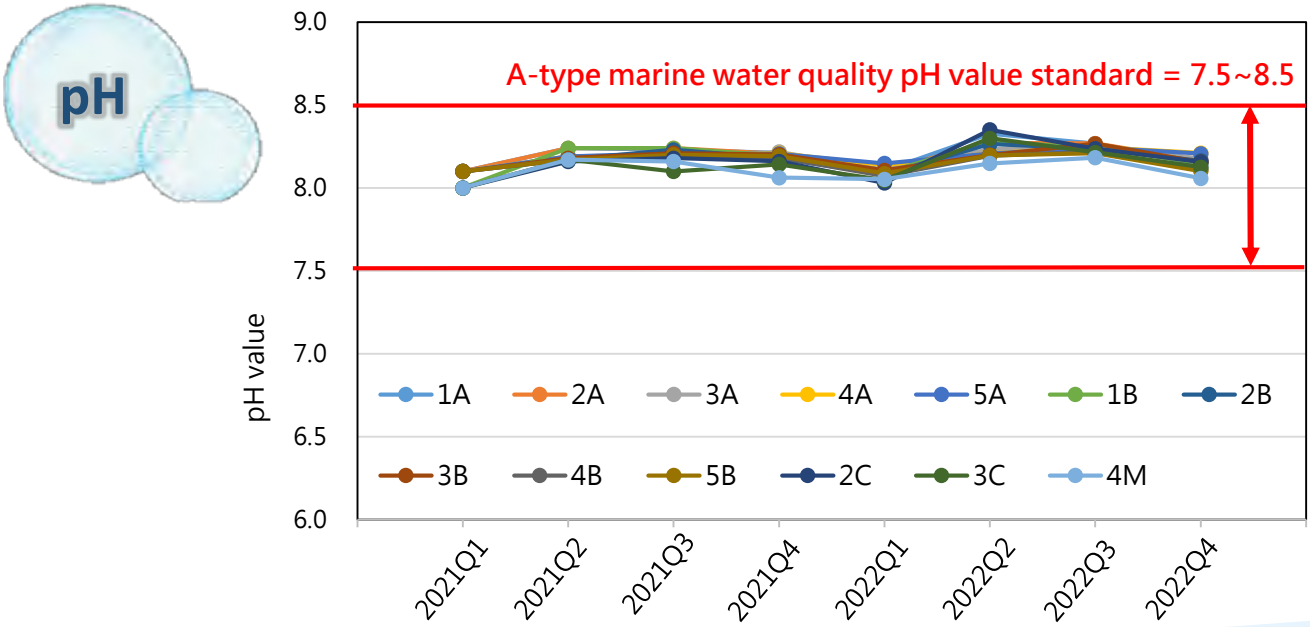
Marine water quality

Marine water quality is subject to the influence of natural factors such as upstream scour and rising and ebbing tides that are cannot be controlled by the harbor. The marine water quality monitoring points are situated in the sea area near the Mailiao Industrial Zone. A total of 13 monitoring points are setting up to monitor 29 monitoring items such as temperature, salinity, dissolved oxygen, pH value, nitrate, E-coli, biochemical oxygen demand, chemical oxygen demand, ammonia nitrogen, total phosphorus, heavy metals, and volatile organics.

Marine water quality test qualification rate was 100% in 2021 and 2022. The detailed monitoring results were attached as Appendix 1. ◦

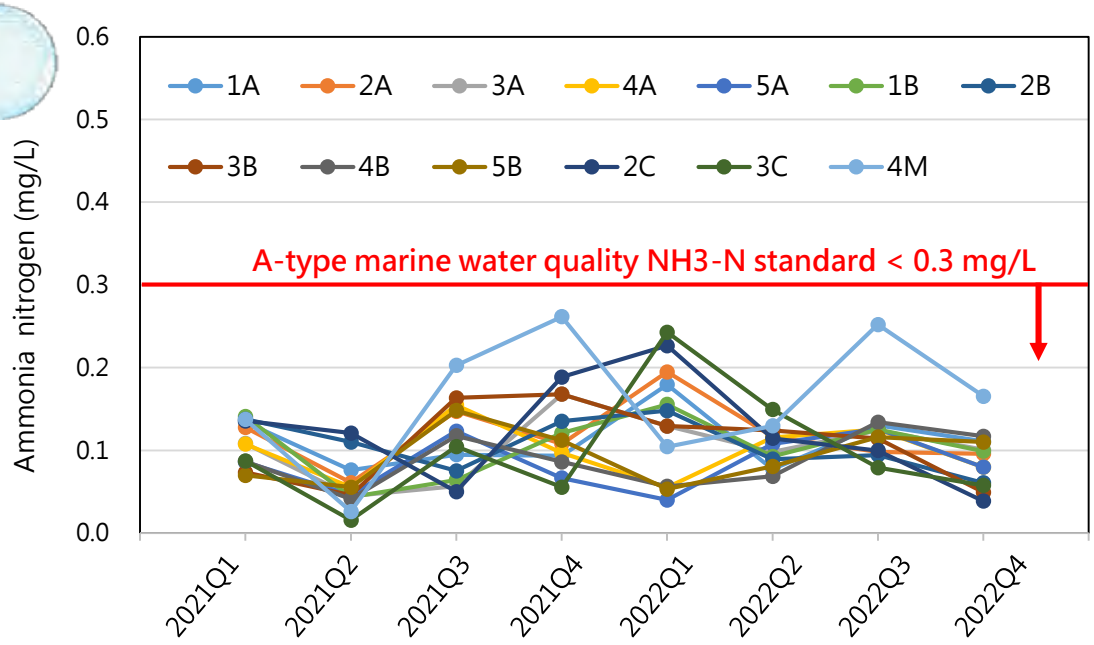
Marine water quality of Mailiao Harbor in 2021 and 2022



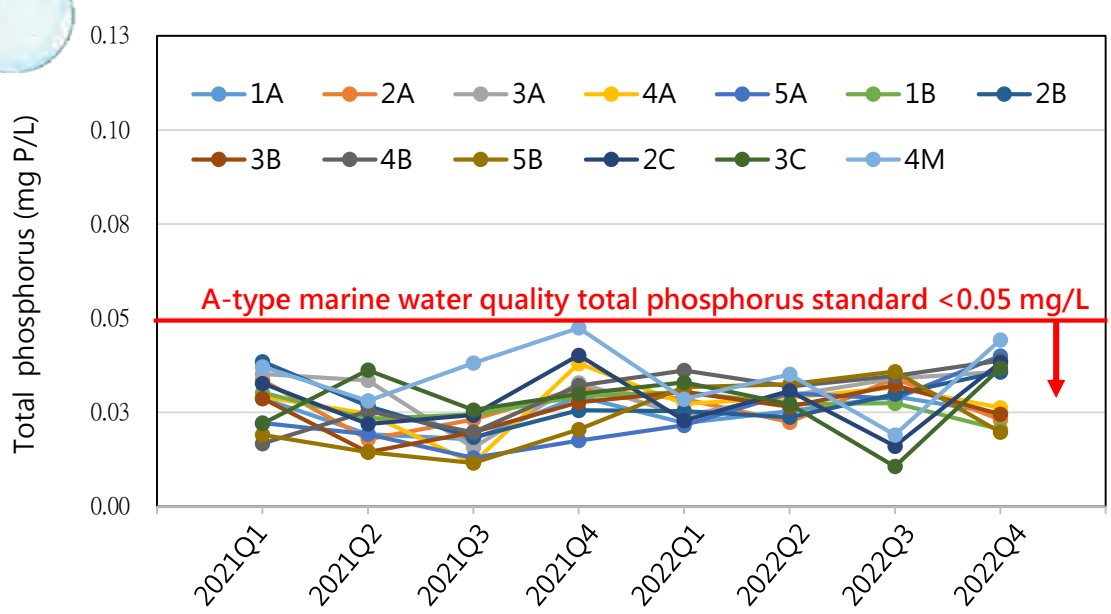


Marine water quality of Mailiao Harbor in 2021 and 2022

NH_3-N



Total Phosphorus

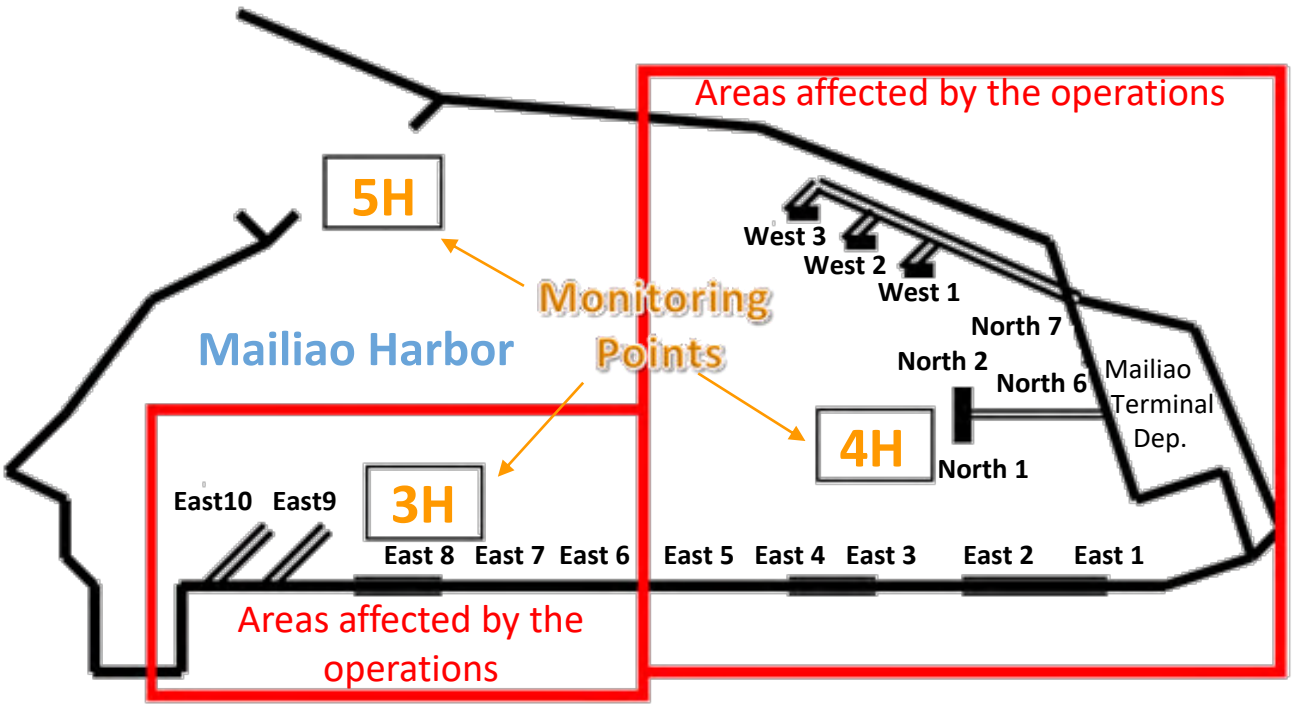


Harbor Area Water Quality

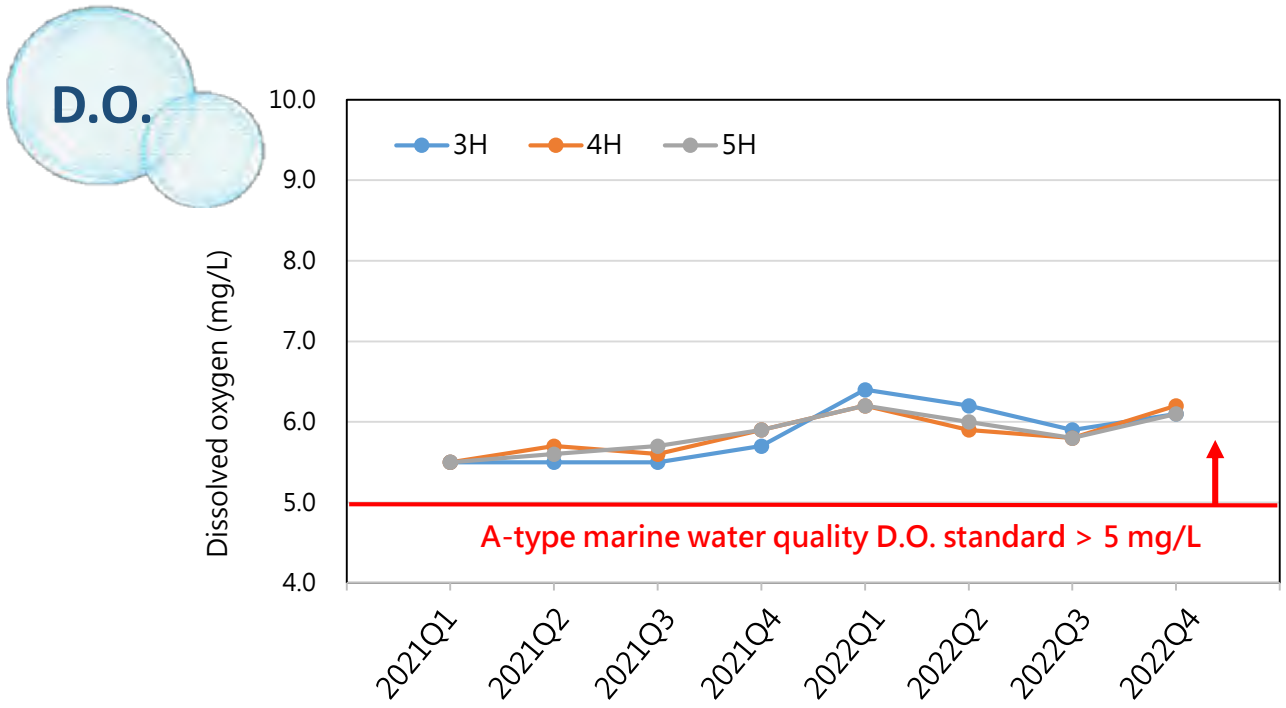
The incoming and outgoing cargoes at Mailiao Harbor are primarily industrial raw materials. To prevent chemical goods from polluting the sea when entering or exiting the harbor, a set of comprehensive guidelines has been formulated and implemented at Mailiao Harbor for water quality protection, including water quality assessment. Three monitoring points were set up within the harbor area, namely 3H–5H.

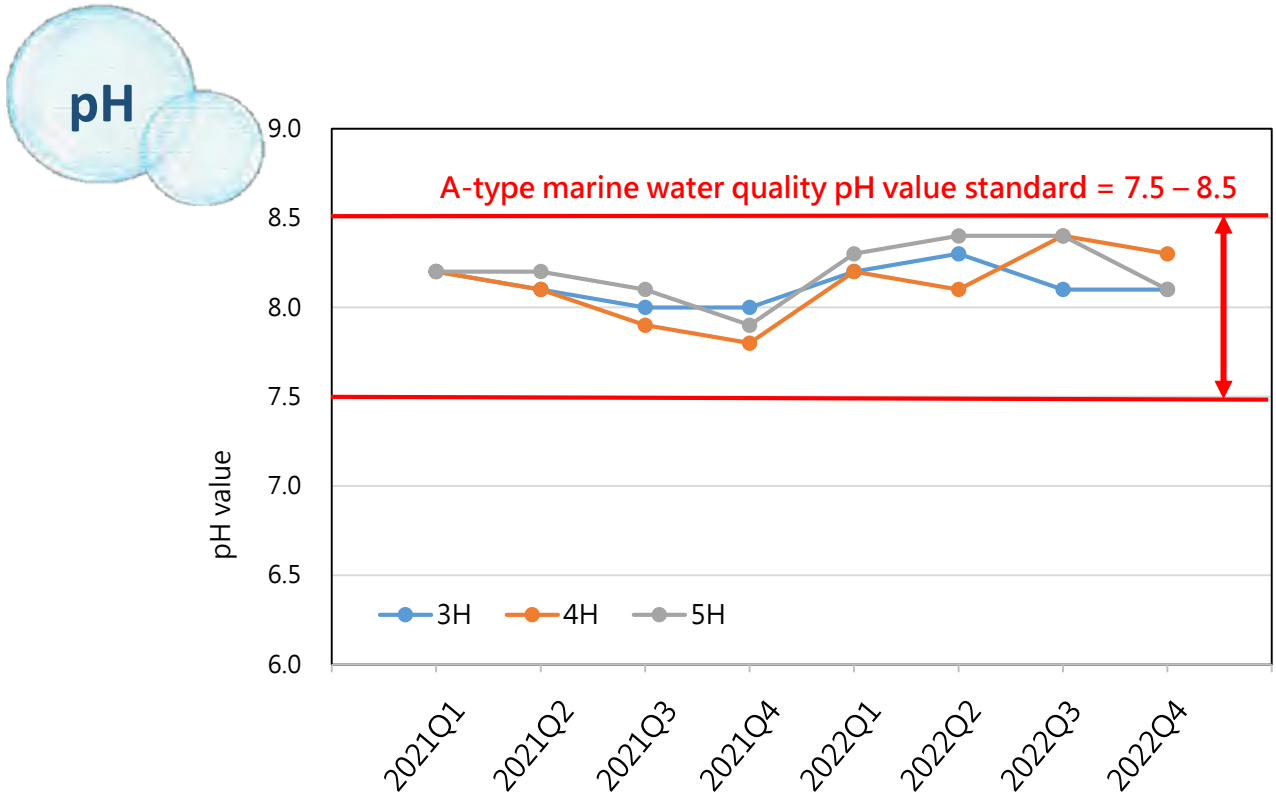
A compilation of the quarter-based assessment results from 2021 to 2022 indicated compliance with the A-type marine water quality standards of the “marine environment categories and marine environment quality standards” stated in Article 8 Paragraph 1 of the “Marine Pollution Control Act.” The detailed monitoring results were attached as Appendix 2.

Location of sea water quality monitoring points at Mailiao Harbor



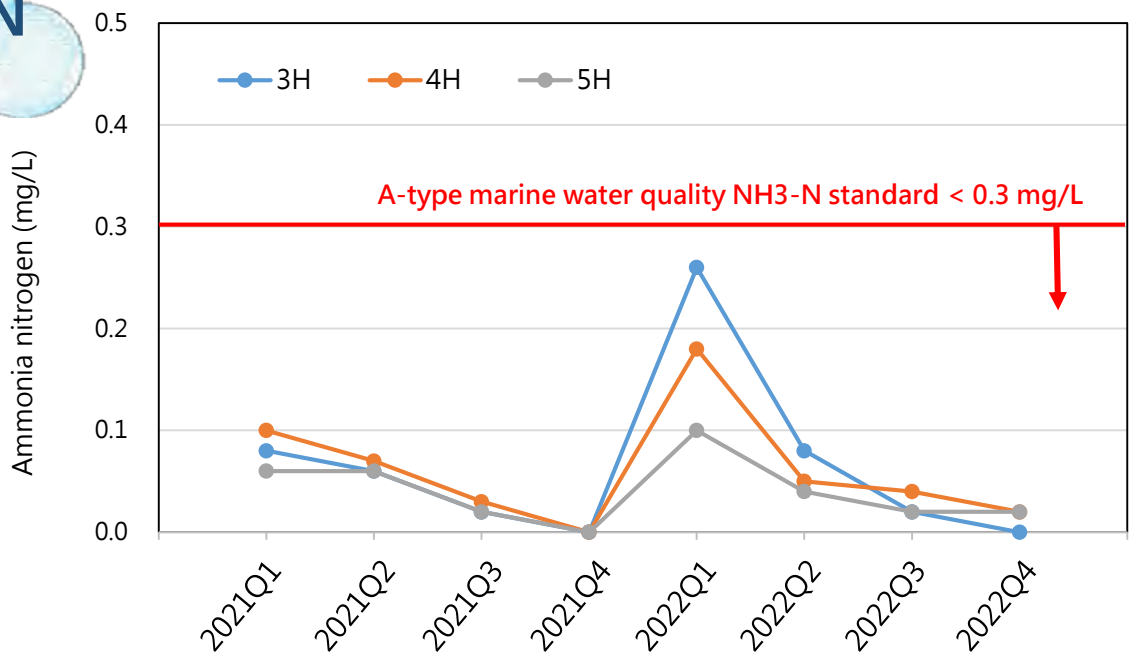
Harbor area water quality of Mailiao Harbor in 2021 and 2022



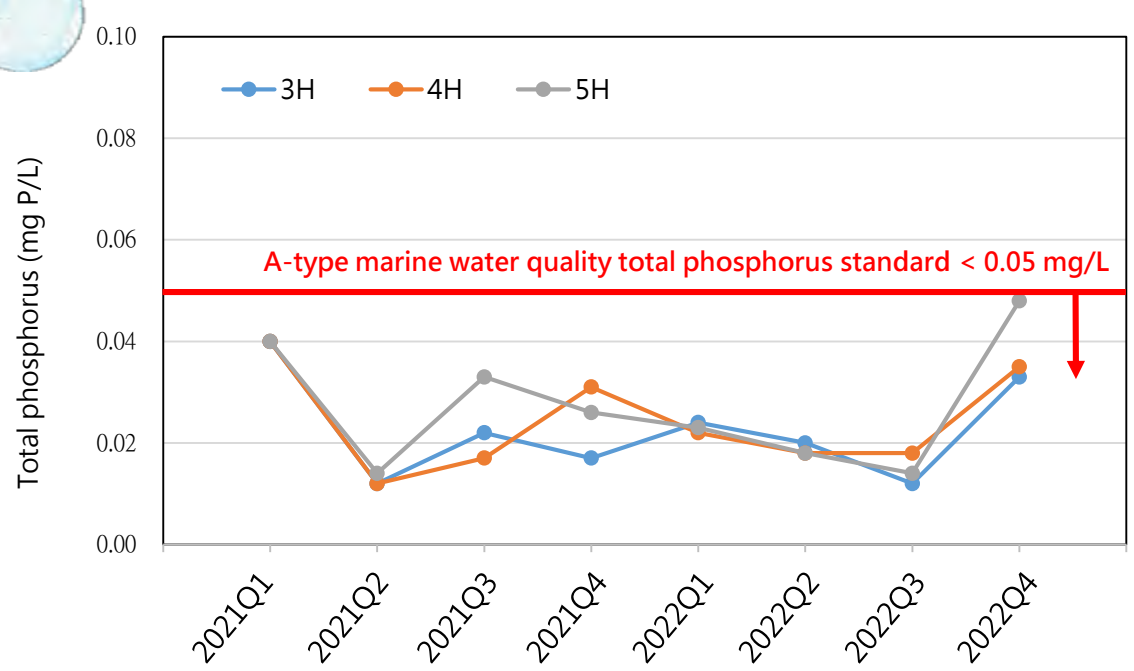


Harbor area water quality of Mailiao Harbor in 2021 and 2022

NH_3-N



Total Phosphorus



Ship Discharge and Bunkering

Additionally, Mailiao Harbor highly values the sea and implements several protection measures, such as requiring all cabin-washing water to be recycled as per the regulations; other requirements include leakage prevention measures and response measures in case of leakage, and they are explained as follows:

Regulations governing cabin prewashing operations

To fulfill the commitment included in the finalized Environmental Impact Statement of the 6th Naphtha Expansion Project and to meet the requirements of the Mailiao Harbor Marine Pollution Control Plan, the harbor has put in place controls for transportation of importing (incoming) chemical cargo vessels. To prevent randomly discharged toxic liquids from polluting the marine environment, the vessels must conduct cabin prewashing operations after unloading their cargo, and the water used must be treated and recycled as per the regulations. Hence, the harbor has clearly defined the scope and method for cabin prewashing. These control operations are clearly defined in the “computer-based tracking and control operations of cabin prewashing wastewater in Mailiao Harbor.” If the control operations are not conducted because the shipped goods are in a different category, then the “Mailiao Harbor cabin prewashing wastewater tracking and control system” is adopted instead to track the vessel to the next port and replace the operating results of Mailiao Harbor with those of the next port, thereby fulfilling management responsibilities.

Leakage prevention and response measures

To prevent marine pollution, two levels of regulations have been established. Level 1 regulations are to formulate appropriate regulations to prevent any possibility of leakage, which include regulations on refueling, standards in the stevedoring of dangerous goods, and unloading guidelines. Level 2 regulations are to formulate response measures to be taken during a leakage event, including immediate treatment and preventing leaks from spreading. Relevant guidelines include the mandatory use of an oil boom to surround the vessel during the stevedoring of oil-based products and chemicals, the installation of pollution prevention facilities and cleaning equipment at all connecting points of the refueling pipeline in the refueling ship during refueling, and the immediate termination of operations in case of oil leakage and any abnormalities. The aforementioned measures are clearly defined in the “Regulations Governing Vessel Refueling at Mailiao Industrial Harbor Administration” and the “Regulations Governing Dangerous Goods Loading and Unloading at Mailiao Industrial Harbor Administration.”

Management of dangerous Cargo

Because Mailiao Harbor is located near the Mailiao Industrial Zone, the possibility of harbor area soil being polluted cannot be ruled out. To prevent pollution of soil and groundwater, the company has implemented pollution prevention measures in the storage tank area. These measures are complemented by the oil and terminal departments, and are explained as follows:

Pollution prevention measures for the storage tank area

To prevent leakage of oil or oil-based products and to reduce the environmental impact incurred by such incidents, the bottom of the storage tanks in the factory area and the surrounding areas are reinforced with barrier constructions, including waterproof material and spill dikes. Leakage test tubes and oil leakage monitors are installed parallel to the bottom and side of the storage tanks. Regular inspection or real-time monitoring is conducted to assess the potential of oil leakage on or near the storage tanks. Oil leakages are managed at various levels based on the leakage potential to achieve the ultimate goal of pollution prevention.

1. Leakage prevention measures

1) Before laying the floorboard of the storage tanks, check that the base has at least 95% compaction.
   Purpose: Floor compaction reduces soil permeability and prevents uneven sinking or tilting of storage tanks.
2) Remove rust and paint the tank floor, as well as apply an anti-corrosion layer and fiber-reinforced plastic (FRP) coating to the joint connecting the floor and exterior wall.
   Purpose: To prevent leakage caused by the corrosion of storage tank steel plates.

2. Barrier measures

1) Before laying the floorboard of the storage tanks, lay high density polyethylene (HDPE) waterproof material.
   Purpose: Prevent leaks from directly permeating the ground and causing groundwater and soil pollution.
2) Construct an interceptor ditch with a reinforced concrete (RC) base on the exterior of the storage tank base.
   Purpose: An RC interceptor ditch can stop leaked oil from flowing into the soil.
3) Construct a spill dike near the storage tank.
   Purpose: To prevent leaks from directly permeating the ground and causing groundwater and soil pollution.

3. Leak test measures

1) Bury horizontal tilt detection tubes at the base of the storage tank.
   Purpose: If leakages flow into the RC interceptor ditch through the tilt detection tubes, then the leak sensor inside the PIT sends an alert signal to staff.
2) Install fuel gas detector (for the oil-based product storage tank).
   Purpose: To send an alert signal to staff immediately when the storage tank leaks.
3) Install a groundwater monitoring well for long-term monitoring of water quality.
   Purpose: To determine whether the storage tank is leaking by understanding the water level and water quality changes in groundwater.
4) Monitor sinking of the storage tank.
   Purpose: To determine changes in elevation of the storage tank, and prevent uneven sinking and tilting of the storage tank.
5) Monitor sinking of the RC interceptor ditch of the storage tank (for storage tanks with an RC base).
   Purpose: To determine the base elevation and prevents the base from uneven sinking and tilting.

Oil tank leakage prevention and detection measures

1. Leakage prevention measures for storage tank floor

1.1 Compaction of storage tank base
1.2 Leak prevention layer on storage tank base
1.3 Drainage tube
1.4 Fuel gases detector tube
1.5 Horizontal inclinometer tube

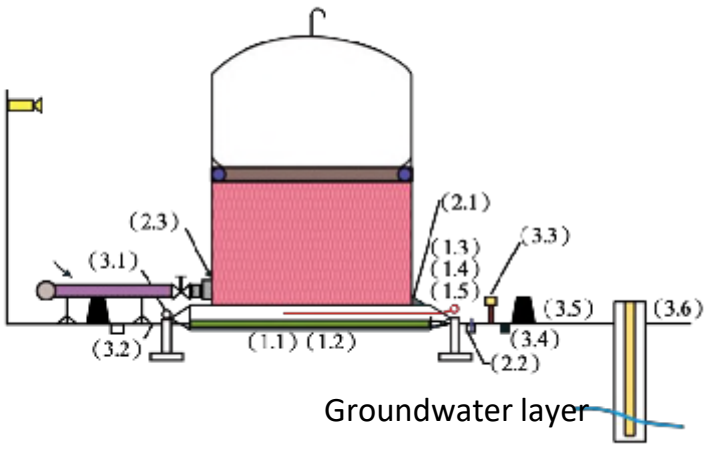


Diagram of leakage prevention measures for a 130,000 kiloliter crude oil storage tank

2. Leakage prevention measures for the body floor

2.1 Anti-corrosion engineering for the floor
2.2 Oil leak detector
2.3 Monitors for body sinking

3. Breakage and leakage prevention measures for the tank body

3.1 RC base sinking monitor
3.2 Floor compaction
3.3 Gas detector
3.4 Rain and wastewater drainage
3.5 Spill dike
3.6 Groundwater monitoring well

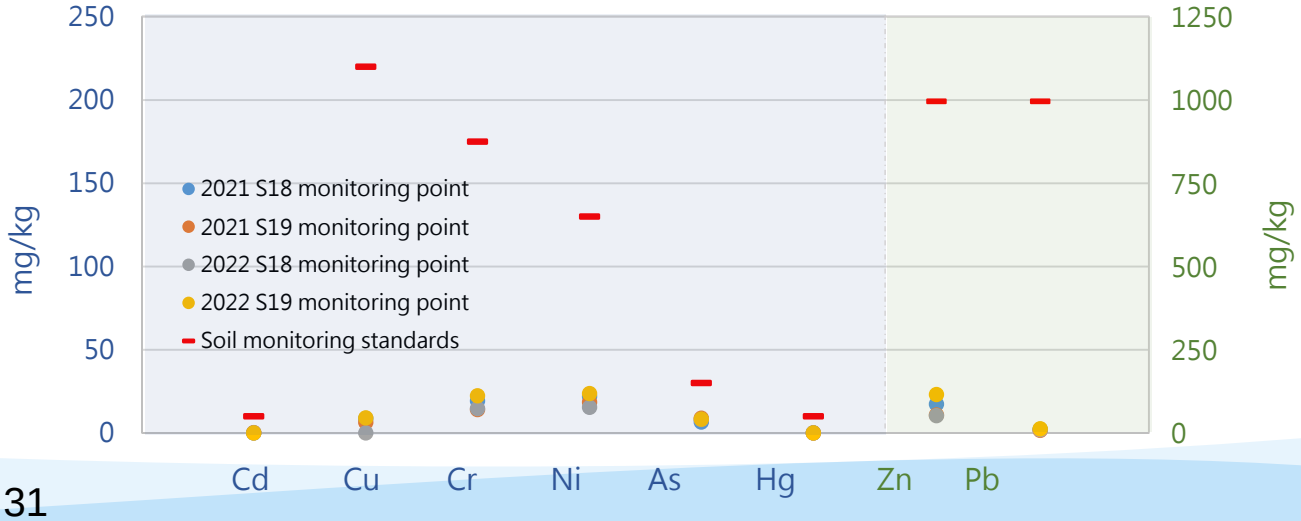
Soil and groundwater

Four soil monitoring points exist near the harbor. Points S18 and S19 monitor soil pH value, eight types of heavy metal element (i.e., cadmium [Cd], chromium [Cr], copper [Cu], nickel [Ni], lead [Pb], zinc [Zn], arsenic [As], and mercury [Hg]), 20 types of volatile organic substances (benzene, toluene, ethylbenzene, xylene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, carbon tetrachloride, chloroform, 1,2-dichloroethane, cis-1,2-dichlorobenzene ethylene, trans-1,2-dichloroethylene, 1,2-dichloropropane, tetrachloroethylene, trichloroethylene, vinyl chloride, hexachlorobenzene, 3,3-dichlorobenzidine, 2,4,6- Trichlorophenol, 2,4,5-trichlorophenol, and pentachlorophenol), and total petroleum hydrocarbons. Points S31 and S32 monitor acrylonitrile.

Mailiao Harbor soil sampling locations map

According to the 2021 and 2022 soil monitoring data, the eight types of heavy metal monitored at stations S18 and S19 were within the limits of soil pollution monitoring standards. None of the 20 types of volatile organic substances were detected. The highest value for total petroleum hydrocarbons was 32.0 mg/kg, which was far lower than the regulatory standard of 1,000 mg/kg. Acrylonitrile, monitored at S31 and S32, was below the detection limit, showing that the soil near the harbor did not suffer any significant pollution.

Heavy metals concentration in soil at monitoring points near the harbor



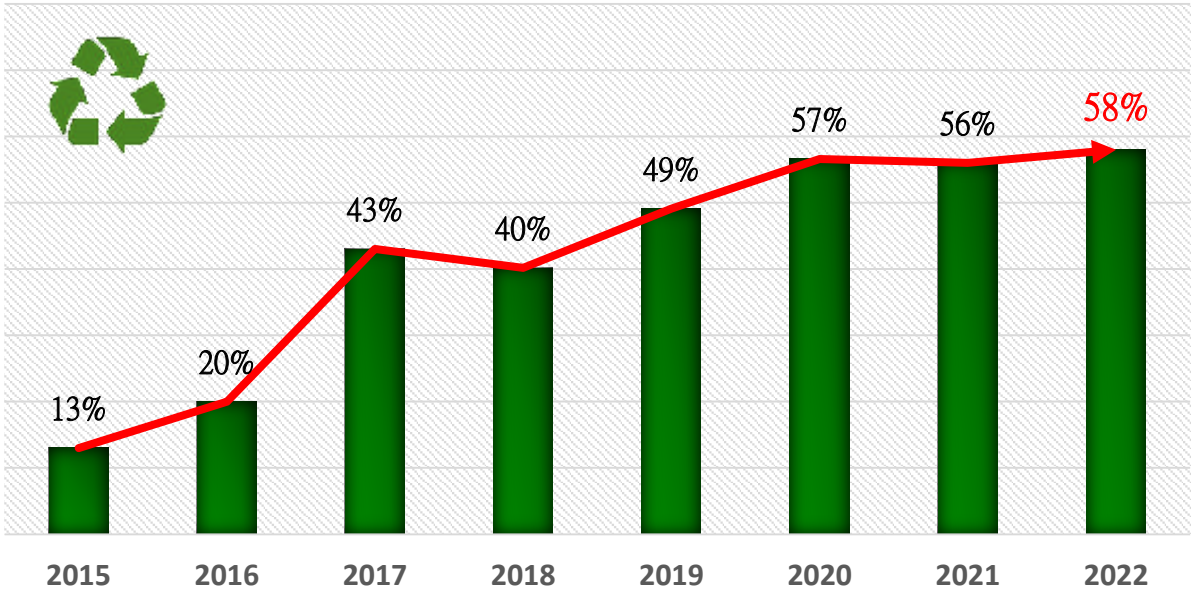
Harbor waste

Mailiao Harbor greatly emphasizes a clean harbor environment. To maintain cleanliness at the harbor and ensure appropriate treatment of waste, the harbor commissioned qualified operators for waste disposal according to the Waste Disposal Act, and clearly defined waste disposal timings to be followed by relevant harbor personnel. Vessels moored at the harbor must comply with the "Notification Form of Garbage Removal from the Vessels Berthing at Mailiao Industrial Harbor" when sorting waste. The Mailiao Harbor Co. actively promotes the importance of sorting waste and has installed waste sorting bins at all offices to enhance the recycling rate of waste at the harbor.

According to refuse management from 2015 to 2022, the recycling rate increased from 13% in 2015 to 58% in 2022. The total amount of refuse collected was reduced from 4,528.21 tons in 2015 to 1,475.02 tons in 2022, highlighting the MHAC's increasing emphasis on and effective promotion of recycling and the reduction of waste. The corporation will continue to promote and implement proper waste management.

Recycling status in 2015 to 2022

(MHAC and the Formosa Petrochemical Corp. MAI-LIAO Terminal Department)



The various operations are explained as follows.

1. Waste reduction at source

1) Garbage produced by vessels berthing at the harbor

- After a vessel berths at the wharf, the “Notification Form of Garbage Removal from the Vessels Berthing at Mailiao Industrial Harbor” is sent to the shipper, requesting the shipper to sort garbage according to the regulations.
- Garbage removal time is 13:00–15:00 daily.

2) Garbage produced by vessels offshore

- Promote garbage sorting to related workers and contractors during meetings.
- Set up waste sorting bins at offices.

2. Waste sorting

1) Garbage produced by vessels berthing at the harbor

- Collect the garbage produced by vessels berthing at the harbor every day, and ask the cleaning personnel to sort the garbage according to company regulations.

2) Garbage produced by vessels offshore

- Dispose and transport the garbage in the garbage sorting bins every day to the waste collection yard, and ask the cleaning personnel to re-sort the garbage according to company regulations.

3. Recycling

After sorting, the garbage at the harbor area (harbor vessel and offshore vessel garbage), are temporarily kept at the waste collection yard.

- According to the type of garbage, recycling firms collect the recyclable wastes, and transport them to various recycling plants for recycling and reuse.
- Garbage that cannot be recycled is transported to a subsidiary of the Formosa Petrochemical Corporation, the Nan Ya recycling plant, for incineration or landfill.

The following table details the types and amounts of industrial waste processed by the MHAC in 2021 and 2022. In 2021 and 2022, the MHAC processed industrial waste including valuable waste, recyclables, general industrial waste, and waste oil and sewage. We calculated the balance, output, and clearance of each type of waste. Among them, valuable waste was mainly waste ferrous materials. The total amount of waste collected was approximately 44 metric tons. Resource recyclables consisted of waste rock wool, waste wood, and waste leather belts; the total amount of such waste was approximately 269 metric tons. General industrial waste comprised cold insulation, paint waste, waste oil, sludge mix, and foam concentrate; the total quantity of such waste collected was approximately 2 metric tons. The total quantity of waste oil and sewage collected was approximately 1,148 metric tons.

Regarding industrial waste, the MHAC conducts regular, random inspections of manufacturers' construction site environment to ensure that waste is appropriately categorized and temporarily stored according to regulations.

MHAC industrial waste types and processing volume in 2021 and 2022

(unit: metric ton)

Type	Valuable	Resource recycling			General industrial waste					Waste oil Sewage
Item	Waste ferrous materials	Waste rock wool	Waste wood	Waste leather belts	Cold insulation	Paint waste	Waste oil	Sludge mix	Primary foaming liquid	
Balance	165	0	16	806	63	0	0	0	0	—
Output	20	5	8	55	0	0	0	0	0	—
Clearance	44	5	14	250	2	0	0	0	0	1,148

Dredging management

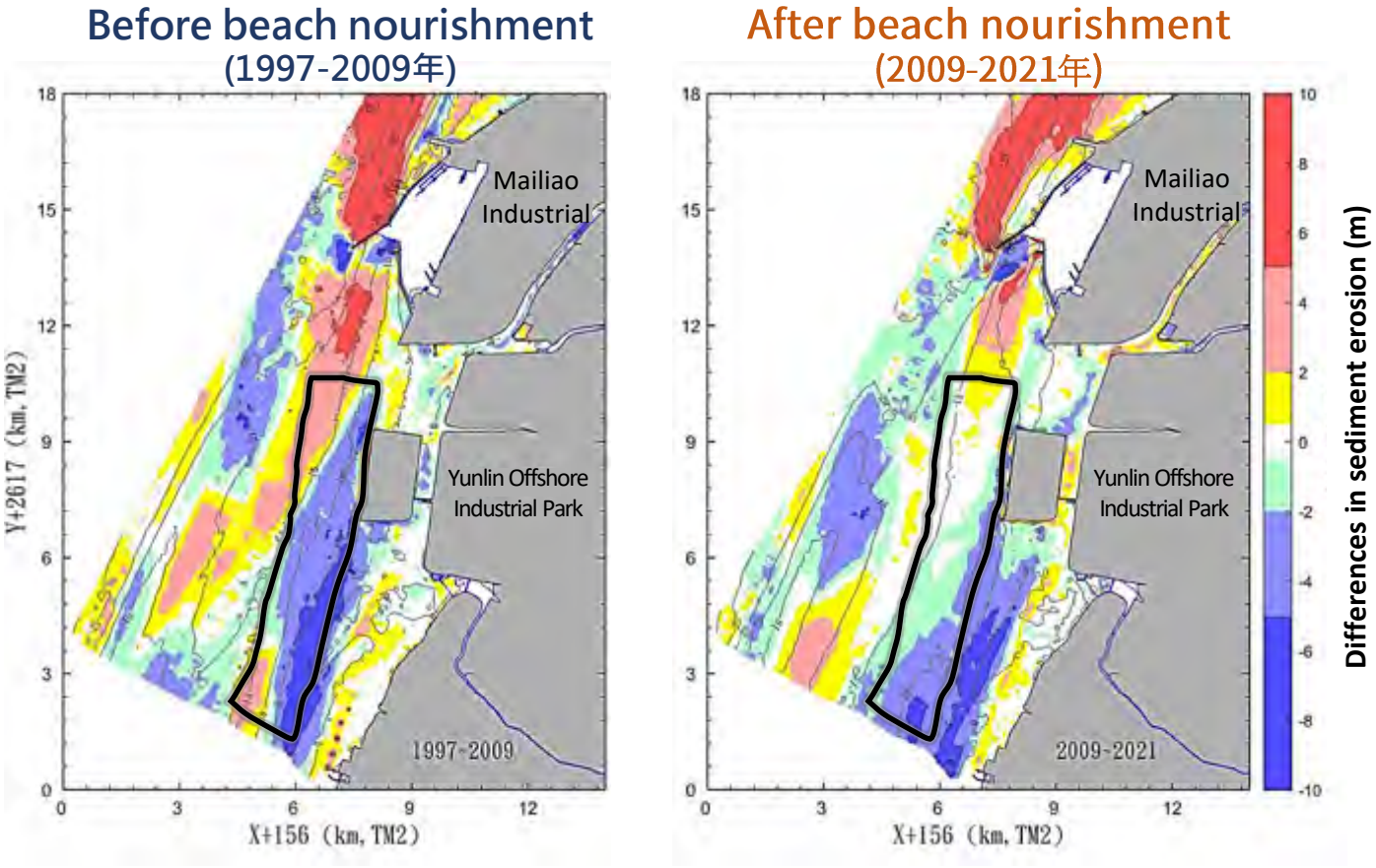
To maintain the course and depth of the harbor, dredging and silting are mandatory. According to the review conclusions of the "Environmental Impact Statement of the Mailiao Harbor Transformation Plan in Yunlin Offshore Industrial Zone," Mailiao Harbor uses sediments of sound quality from external channel dredging excavation to cover erosion at the south bank caused by development of Mailiao Industrial Park. This landfill operation, which began in 2009, is ongoing.

The landfill volume is based on the numerical simulation results obtained by professional research institutes. The simulation results estimated that a throwing amount of 600,000 to 1,000,000 m^3 of sand could achieve sand transport balance.

The landfill method used a sand dredger to dredge channel silt, and then the suspended sand in the upper layer of the cabin was eliminated using the overflow method; finally, superior-quality sand with larger particles that settled at the bottom of the cabin was transported and dumped at the landfill site. Landfilling is paused during oyster spawning, and water quality monitoring is conducted during landfilling to prevent the activity from affecting the marine ecology.

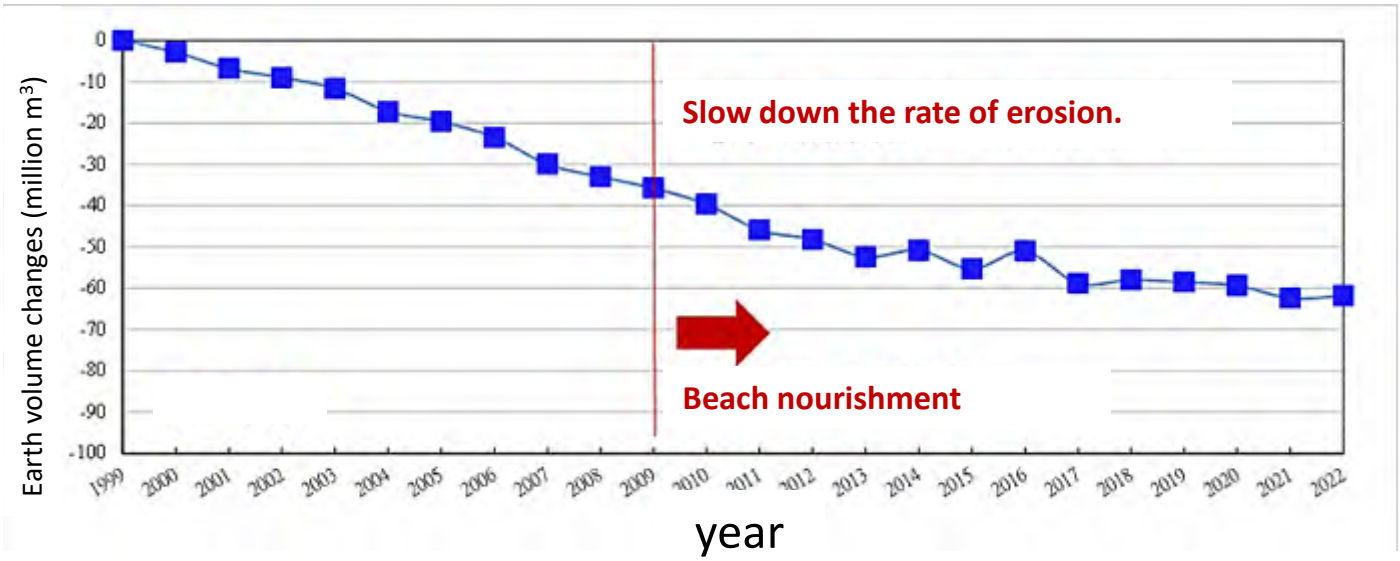
The survey results of water depth topography over the years have indicated that landfill and beach nourishment could make up for a part of the sand source of the eroded area, and help to reduce regional changes in plane siltation. For example, the south side of the Hsin Hsing Zone, which has a depth of 10–15 m, continues to show erosion. The water depth and topography will continue to be monitored, and the effectiveness of landfill and beach nourishment shall be reviewed periodically.

Comparison of Mailiao Harbor 12 years before beach nourishment and 12 years after beach nourishment



*Note：The black frame indicates the beach nourishment area.

Earth volume changes from 1999 to 2022 (the beach nourishment area)



(Date source: Bureau of industrial Parks, Ministry of Economic Affairs, 2022)

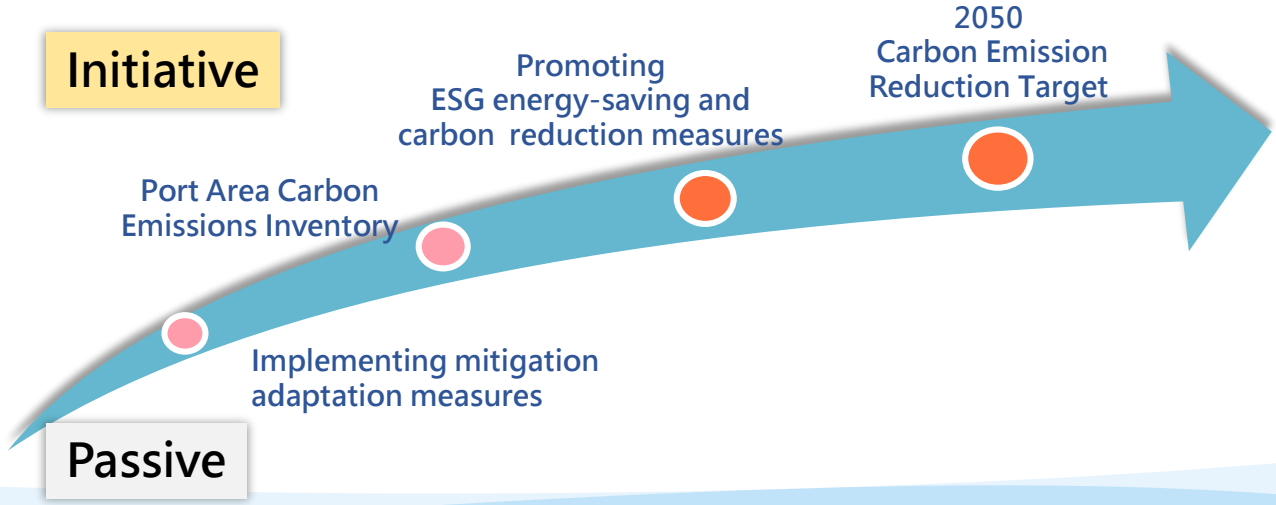
Climate Change Adaptation and Green Energy Transition

In response to global climate change and the need to implement necessary mitigation and adaptation strategies, our country takes the responsibility of environmental protection as a priority. On April 22, 2021, Earth Day, Taiwan declared its goal to achieve net-zero emissions by 2050 and amended the original “Greenhouse Gas Reduction and Management Act" to the "Climate Change Response Act" on February 15, 2023. The aim is to reach net-zero emissions goal by the policies for greenhouse gas (GHG) reduction and climate change adaptation.

Formosa Plastics Group shows its dedication to reducing air pollution and supporting environmental sustainability. They hosted an environmental forum on July 20, 2021, bringing together experts from various sectors. With the Ministry of Environment and other stakeholders present, they signed the "Carbon Neutrality and Green Energy Technology for Sustainable Environment" declaration with Yunlin County Government. This initiative emphasizes circular economy planning, energy-saving measures, and achieving net-zero carbon emissions by 2050.

Port Area Climate Change Adaptation

Climate change has major impacts on port areas. Rising global temperatures cause sea ice to melt/expand, leading to higher sea levels and increased tidal fluctuations, storms, waves, and extreme weather. To ensure Mailiao Harbor's sustainability and safety, the port company has taken adaptation measures. This includes conducting a carbon emissions inventory, promoting energy-saving measures, and aiming to reduce carbon emissions by 2050.



Establishment of wave monitoring system

Mailiao Harbor has strengthened its assessment of potential impacts and risks from climate change on the port area by establishing a wave monitoring system. The port has commissioned professionals from National Kaohsiung University of Science and Technology to implement the "Mailiao Harbor Wave Monitoring Program." Real-time wave monitoring stations have been set up at North Piers 2 and 5 in Mailiao Harbor, utilizing the Nortek Acoustic Wave and Current profiler (AWAC) to monitor wave conditions. The information is provided to ship operators and loading/unloading equipment personnel for reference, and data is statistically analyzed to establish appropriate wave alert values specifically for Mailiao Harbor's operations. This proactive approach aims to prevent and mitigate potential damages caused by adverse wave conditions.

Wave observation station site

Nortek AWAC

Wharf revetment road elevation improvement

With climate change becoming increasingly severe, rising sea levels accompanied by heavy rain, storm surges, and the impacts of typhoons, the Port area has historically been prone to sea water flooding on the dock roads during spring and neap tides or periods of elevated water levels due to low pressure, which affects the safety of vehicular and pedestrian traffic. Therefore, the MHAC commissioned CECI Engineering Consultants to conduct an assessment of raising the dock face panels and revetments on the southeast and northeast sides of the port's quay area. This assessment considered current design regulations and estimated the corrosion rate of steel piles up to a 50-year limit, ensuring the safety and integrity of the facility's structure. The revetment road elevation project, completed in 2019, successfully resolved the prior problem of dock flooding caused by monthly tidal cycles.

Wharf revetment road elevation improvement

Before improvement work

After improvement work

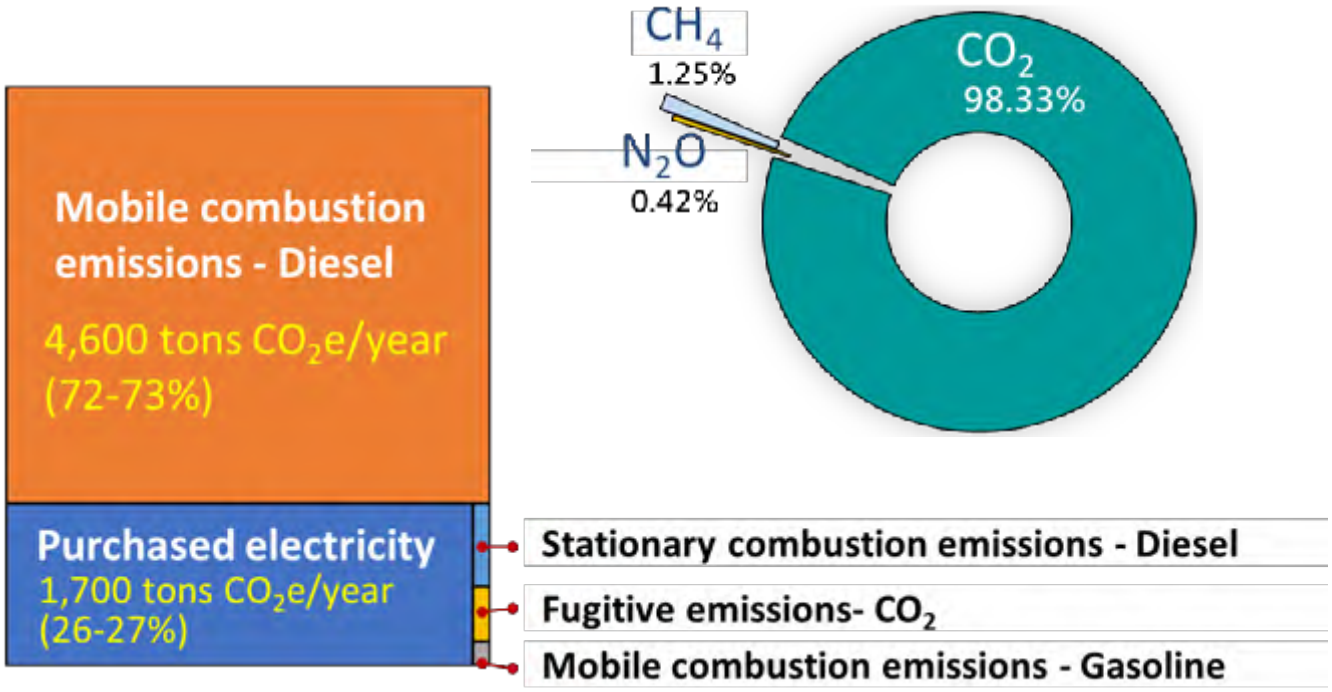
Regular GHG inventory

To monitor GHG emissions in the port area, the port company conducts regular GHG inventories of GHG emitted within the port area. This includes calculating emissions from direct GHG sources and indirect energy sources related to port operations, such as fixed combustion emissions (diesel), mobile combustion emissions (diesel, gasoline), fugitive emissions (from septic tanks), and purchased electricity. The emissions inventory covers six GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

In 2021 and 2022, GHG emissions at Mailiao Harbor were primarily from mobile sources using diesel fuel, accounting for 72-73% of the port area's GHG total emission, with an annual emission of approximately 4,600 metric tons of CO2e. The main operational activity contributing to these emissions is the use of diesel fuel in port tugboats. The second-largest source is purchased electricity consumption, accounting for 26-27% of emissions, with an annual emission of about 1,700 metric tons of CO2e. Other operational activities' emissions account for less than 2% of the total. Furthermore, the GHG emissions during 2021 and 2022 were mainly composed of carbon dioxide (CO_2) at 98.33%, followed by nitrous oxide (N_2O) at 1.25% and methane (CH_4) at 0.42%.

In alignment with Formosa Plastics Group's 2050 carbon emission reduction goal, Mailiao Harbor continues to plan and implement carbon reduction initiatives. Using 2018 as the baseline year, the initial target is set to achieve a 7% reduction in carbon emissions by 2025.

Mailiao Harbor GHG inventory results and emission percentages for 2021 to 2022



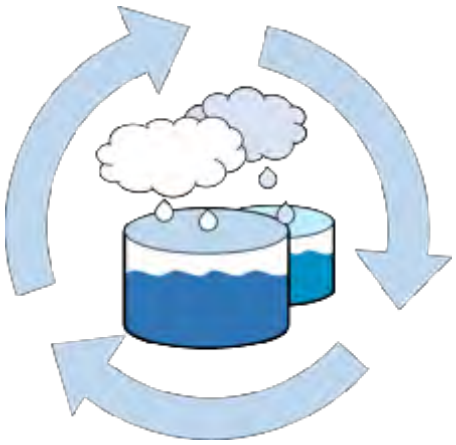
Adoption of green office environment practices

To implement green practices in the port area, the port company has developed a checklist of 35 measures for green office initiatives. These measures are categorized into five indicators: energy and resource conservation (such as reducing electricity, water, oil, and paper usage), waste reduction at the source (including sorting and recycling), green procurement, environmental beautification, and advocacy. The implementation includes actions like regulating office air conditioning temperatures, using energy-saving lighting and water-saving facilities, paperless office practices, promoting carpooling, enforcing waste recycling and sorting, organizing environmental knowledge training or lectures, and utilizing green lifestyle materials for promoting green living among the port company's employees through internal community and media resources.

Rainwater harvesting project

Promoting sustainable water resource utilization, Mailiao Harbor has installed three rainwater collection tanks with a capacity of 20 tons each at the port administration building. Through rainwater collection equipment, rainwater retention and reuse have been enhanced to achieve water-saving benefits. Additionally, spill-proof barriers are installed in the dock operation and unloading area to directly collect runoff rainwater. Rainwater from road surfaces is collected through dedicated discharge channels, and the design of catch basins effectively removes pollutants and solid waste particles.

From 2021 to 2022, the cumulative rainwater collection in the Mailiao Harbor area has been measured. The port administration building collected 337 metric tons of rainwater, while the tank area collected 723,488 metric tons. The rainwater reuse rate after collection reached 100%



LED lighting and energy storage equipment

In alignment with Formosa Plastics Group's ESG energy-saving and carbon reduction policies, the port company has actively replaced energy-efficient lighting fixtures since 2016. As of now, the entire administrative area of the port has completed the replacement of all lighting fixtures, totaling 706 lamps, resulting in significant energy savings.

Additionally, efforts have been made to enhance the efficiency of green energy usage by powering navigation lighthouses and fixtures in the port area with solar energy. In 2021, a feasibility assessment was conducted, and plans were made to install solar panels on a 2,497.5 square meter parking lot,, with a capacity of approximately 241.76 peak kilowatts (kWp). This is estimated to generate 320.09 thousand kilowatt-hours (kWh), effectively reducing carbon emissions from electricity use in the Mailiao Harbor area. The installation is expected to be completed by 2025.

Ecological conservation

In response to rapid changes to the environment, in addition to avoiding the pollution that could be caused by various types of human activities, Mailiao Harbor considers ecological conservation and regeneration urgent and critical. The harbor places great emphasis on the marine environment and the symbiotic system of the marine ecosystem, and actively participates in marine regeneration work, including conservation measures for the protection of the critically endangered white dolphin and regeneration of fishery resources. Thus, the Mailiao Harbor Company not only shows a responsible spirit for pollution prevention, but also is active in ecological conservation and regeneration. The white dolphin conservation measures and release of fry are detailed in the following paragraphs.

White dolphin conservation measures

The International Union for Conservation of Nature declared the Chinese white dolphin critically endangered (CR) in August 2008. However, since March 2008, Formosa Plastics Group has continually run a survey project, and the results obtained so far indicate that the Chinese white dolphin is mainly found in long and narrow sea area within 3 km offshore, in water less than 15 m in depth, and primarily moving in a north–south direction. The number of white dolphins along the Yunlin coast constitutes more than half of the species' number along Taiwan's west coast; this is also a vital nursery area. The white dolphin conservation measures implemented by Mailiao Harbor are explained as follows.

1. Regulation of incoming and outgoing vessel speed

Cargo carriers entering and exiting the harbor should be alert for white dolphins. If white dolphins are sighted ahead, then the vessel must reduce its speed to less than 6 knots provided it does not affect navigational safety; however, because of weather and sea conditions, some large vessels must maintain a speed of more than 7 knots. For instance, if the sea condition is a flat tide with no flow (within 0.5 hr before and after a high or low tide), and the visibility is more than 2,100 m with a wind speed of less than 3, then the signal station would inform the pilot, who would first consider the navigational safety before deciding whether to enter the harbor at under 6 knots.

2. Regulation of sand dredging and landfill vessels

Before dredging the channel for sand, the work boats should ensure that no white dolphins are in the harbor before performing sand extraction and landfill operations. The monitoring and regulation of sand extraction vessels are conducted by the Mailiao Harbor signal station, which is explained as follows:

1) Sand extraction vessels use radar and a global positioning system for vessel positioning and navigation.
2) The signal station uses radar and an automatic identification system on vessels to monitor their position, which it continues to record. Upon receiving a report of a white dolphin sighting, the signal station immediately informs the sand extraction vessel and nearby merchant vessels to reduce vessel speed and implement appropriate collision avoidance measures.
3) Originally, a plan existed to install monitoring recorder systems on sand extraction vessels to record operations. However, considering the low efficiency of the original sand extraction vessels, sand extraction operations were commissioned to foreign professional sand extraction vessels, enabling a reduction in the number of sailings as well as reducing the probability of affecting white dolphin activities.

3. The pH value of marine water quality near Yunlin

According to the monitoring results of water quality in nearby sea areas, the pH can be maintained between 7.5–8.5, and the pH value of discharged water by various factories can conform to the legal requirements of the MOENV. The pH value of seawater near Yunlin will be continuously monitored.

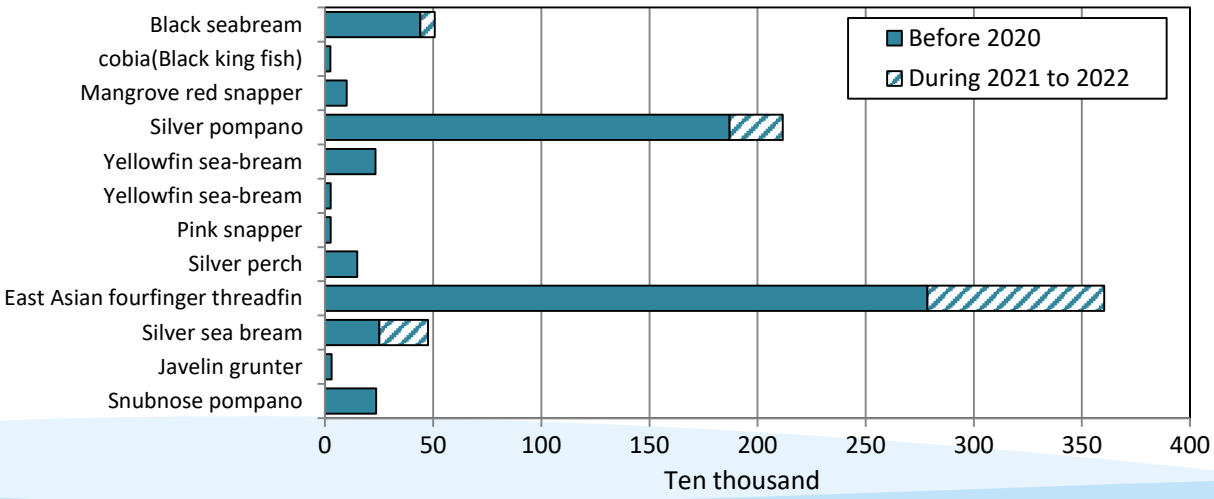
Measures of fry releasing

Because of the depletion of coastal resources in Taiwan, and in order to exhibit friendliness to local environment, Formosa Plastics Group has promoted the proliferation and release of fry for conservation purposes in the Yunlin Mailiao marine area for many years.

This was in response to the regeneration of fishery resources promoted by the local government, and it has enriched local fishery resources and enhanced the catches of fishermen in the area. Since the initial release of fry in 2008, the operation has been implemented more than 15 years, releasing close to 7 million fry. Additionally, to enhance the ecology conservation concept of the masses, conservation activities have actively been promoted; lecturers with a background in marine ecology conservation as well as knowledge of fisheries were hired to teach conservation lessons with the expectation that this regeneration strategy would be used to stimulate sustainable development of local fisheries. In 2014, Formosa Plastics Group was awarded the “Marine Oscar”, an award set by the Council of Agriculture, as the model for marine resources proliferation and fry release.

Additionally, Formosa Plastics Group and the Yunlin Fishery Association released fry at Boziliao Fish Harbor, inviting children and government authorities to witness the event. The fish species released included the East Asian fourfinger threadfin, silver pompano, and black seabream. The Yunlin Fishery Association reported significant increases in catches due to Formosa Plastics Group's long-term participation in marine regeneration and expressed hope for the group to continue these operations. Consequently, high-value fish species that had become scarce due to overfishing are now reappearing.

Statistical diagram of the total amount of fry released during 2008~2022



Marine Ecology and Environmental Photography project

Mailiao Harbor, located on the western coast of Yunlin County, sits on reclaimed land dedicated to the development of the Yunlin Offshore Industrial Park. To record the underwater ecology inside and outside the harbor, Mailiao Harbor commissioned the Coastal Waters and Environment Center of National Marine Technology University of Kaohsiung to conduct a survey on the undertake marine environment photography.

The underwater marine ecology in six main areas inside and outside Mailiao Harbor were photographed: (A)Harbor Patrol canal; (B)Bulk Cargo Terminal (East Berths 1-5); (c)Oil and Chemical Terminal (East Berths 6-10); (D)Northwest Pier Wharf; (E)South Breakwater; (F)West Breakwater. Also photographed were the marine environment monitoring operation process inside and outside the harbor, and harbor operations such as vessels entering and exiting the harbor, stevedoring operations at the wharves, and harbor health, safety, and environmental protection management operations. The green ecological environment in adjacent areas, such as the green and environmental construction of the Mailiao Industrial Zone, was also recorded.

The underwater ecological survey revealed a rich diversity of marine life within the harbor, which is more diverse than in 2016. As of September 2023, recorded species include chordates, arthropods, mollusks, cnidarians, echinoderms, sponges, annelids, bryozoans, comb jellies, and red algae from the plant kingdom. There were 10 phyla in total, including 87 species newly recorded. With the increasing frequency of surveys, the cumulative number of biological species is also showing an upward trend.

The six main underwater ecological areas of Mailiao Harbor

Harbor ecology

Telmatactis sp.

Turbinaria peltata

Ctenophores

Phidiana militaris

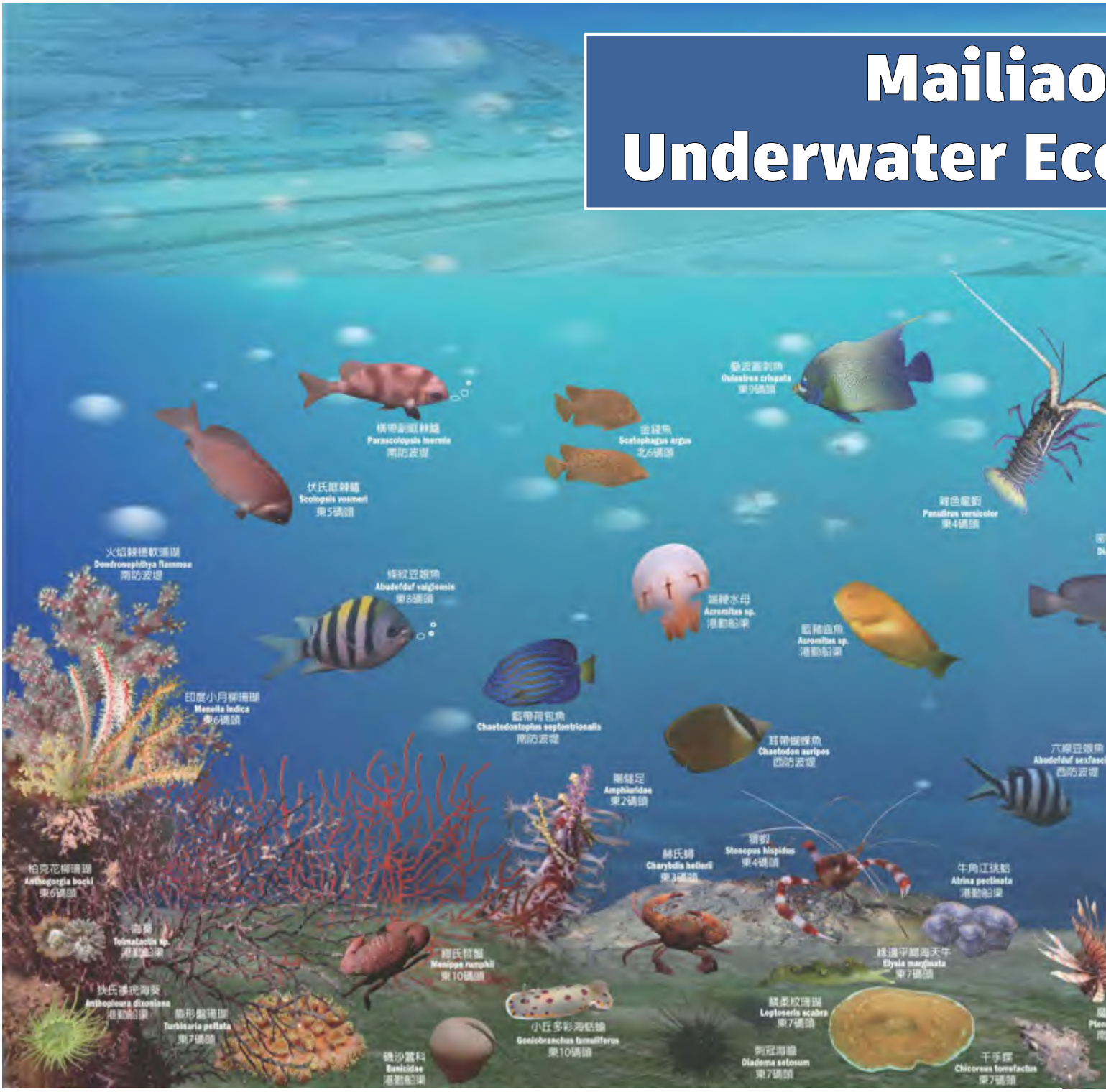
Pinctada margaritifera

Doclea sp.

Stichopus horrens

Pomacanthus annularis

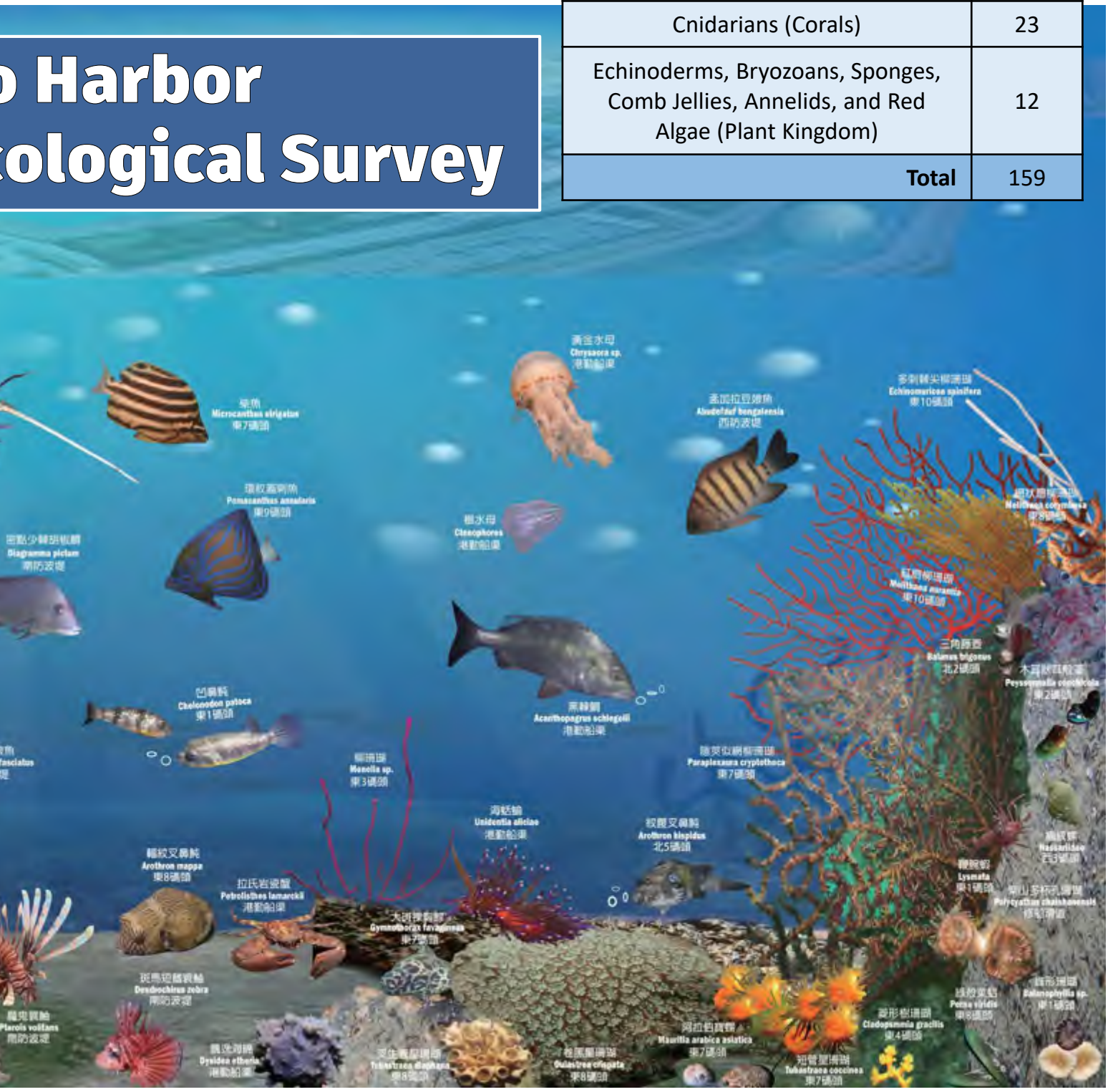
Ostracion immaculatum



(Coastal Water and Environme

o Harbor
cological Survey

Category	Count
Chordates (Fish)	71
Arthropods (Shrimp and Crab)	29
Mollusks (Snails and Bivalves)	24
Cnidarians (Corals)	23
Echinoderms, Bryozoans, Sponges, Comb Jellies, Annelids, and Red Algae (Plant Kingdom)	12
Total	159



ment Center, National Kaohsiung University of Science and Technology, Assisted in Production.)

Environmental performance indices - Port authority

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
1. Air quality	Ratio of harbor craft boats using low-emission fuel and the usage volume (super diesel; sulfur content <10 ppm):	•Number of harbor craft boats using low-emission fuel (super diesel) ÷ Total number of harbor craft boats × 100% •Volume of low-emission fuel used by harbor craft boats	100%		100% ■Harbor craft boats: 13; harbor craft boats using low-emission fuel: 13 ■Low-emission fuel used by harbor craft boats: 1,747.212 kL (The boats are replaced with new ones annually as needed.)	100% ■Harbor craft boats: 13; harbor craft boats using low-emission fuel: 13 ■Low-emission fuel used by harbor craft boats: 1,780.796 kL (The boats are replaced with new ones annually as needed.)
	Ratio of harbor craft boats using shore power	Number of harbor craft boats using shore power (vessel) ÷ Total number of harbor craft boats (vessel) × 100%	100%		100% ■Harbor craft boats: 13; boats using shore power: 13 (The boats are replaced with new ones annually as needed.)	100% ■Harbor craft boats: 13; boats using shore power: 13 (The boats are replaced with new ones annually as needed.)
	Emission standards for air pollution control equipment	Conduct flue detection for air pollutants (i.e., TSP, SO2, NOx and VOCs) in waste gas at the rear of the incinerator.	TSP	100%	100%	100%
			SO_2	100%	100%	100%
			NOx	100%	100%	100%
			VOCs	100%	100%	100%
	Rate of appropriate volatile organic compound (VOC) leakage handling	Periodically use GasFind IR; once leakage is discovered, immediately repair or change the component.	100%		■Number of leaking components: 0; number of appropriately handled components (including repaired or changed): 0	■Number of leaking components: 0; number of appropriately handled components (including repaired or changed): 0
2. Climate change	Greenhouse Gas Management in Port Area	Annual Port Area Greenhouse Gas Inventory	≥1 time/year		1 time/year ■Greenhouse gas inventory: 6,349.9 tons CO2e	1 time/year ■Greenhouse gas inventory: 7,026.1tons CO2e
		Continuously track the main sources of greenhouse gas emissions in the port area	≥1 time/month		1 time/month ■Primary Source Tracking; Mobile Combustion Emissions - Diesel	1 time/month ■Primary Source Tracking; Mobile Combustion Emissions - Diesel

Environmental performance indices - Port authority

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
3. Energy Consumption	Rainwater harvesting	According to the rainwater harvesting project, the annual volume of rainwater harvested and usage rate at the harbor administration building and trough area are calculated. Water conservation measures: The harbor company installed three water harvesting troughs (20 tons ×3) for rainwater harvesting and reuse in the harbor operations administration area.	Trough area	100%	100% ■rainwater harvesting volume: 321,550 tons	100% ■rainwater harvesting volume: 401,938 tons
			Harbor	100%	100% ■rainwater harvesting volume: 160 tons	100% ■rainwater harvesting volume: 177 tons
	Exchange rate of lighting equipment	Number of harbor administration area street lamps changed to power-saving LED lamps. Total number of lamps changed ÷ Total number of lamps = Lamp exchange rate	100%		100% ■Port authority: All replacements have been completed. (A total of 706 lamps have been replaced since 2016.)	
4. Water quality	Qualification rate of marine water quality	Ratio of the monitoring results from the marine water quality monitoring stations outside Mailiao Harbor conforming to the marine environment classification and ocean environment quality standard .	90% (Marine water quality qualification rate is not set to 100% because it is subject to the influence of natural factors such as upstream scour and rising and ebbing tides that are cannot be controlled by the harbor.)		100%	100%
	Harbor water quality qualification rate	Ratio of the monitoring results from the marine water quality monitoring stations inside Mailiao Harbor conforming to the marine environment classification and ocean environment quality standard.	100%		100%	100%
5. Management of dredging	Qualification rate of water quality after beach nourishment	Test for water turbidity 1 hour after landfill and beach nourishment operations to determine whether the turbidity level falls below the level of Class A marine environment (i.e., 50 NTU), a level that does not affect the survival of oysters	100%		100%	100%
	Qualification rate of sediment quality (Ar, Cd, Cr, Cu, Hg, Ni, Pb, and Zn)	Sediment quality satisfying the upper limit of sediment quality indices in the “Regulations Governing the Classified Management of Sediment Quality and Usage Restrictions.”	100%		100%	100%

Environmental performance indices - Port authority

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
6. Harbor waste	Implementation rate of ship waste oil and sewage cleanup by qualified businesses	The number of ships commissioning qualified businesses to collect waste oil and sewage ÷ the number of ships whose waste oil and sewage are collected × 100%	100%		100% ■Number of ship cleaning operations conducted: 33次	100% ■Number of ship cleaning operations conducted: 24次
7. Vessel discharge (sewage)	Locking of vessel sewage valve	When conducting vessel safety and sanitation inspections, the port security section personnel check whether the external sewage valve has been closed and locked.	Sampling rate	15%	**13.5%** **(Affected by the COVID-19 pandemic and the government's pandemic prevention regulations; the on-board inspection rate was below 15%.**	**11.4%** **(Affected by the COVID-19 pandemic and the government's pandemic prevention regulations; the on-board inspection rate was below 15%.**
			locking of vessel sewage valve	100%	100%	100%
	Water quality test in trough area before and after sewage processing	Raw qualification rate of sewage collection = Raw number of qualification in sewage collection test/number of sampling tests Qualification rate of sewage discharge = Number of qualification in sewage discharge test/number of sampling tests	Raw qualification rate of sewage collection	100%	100% ■Number of sampling tests:467	100% ■Number of sampling tests:467
			Qualification rate of sewage discharge	100%	100% ■Number of sampling tests:365	100% ■Number of sampling tests:365
8. Habitat/ (marine) ecosystem	White dolphin conservation measures (in accordance with the commitment made in the environmental impact assessment, under weather and sea conditions that are safe for navigation, vessels should reduce speed to below 6 knots; calculate the implementation rate of vessels complying with speed restriction guidelines)	Number of times sea conditions were confirmed ÷ number of flat tides × 100%	100%		100% ■Number of sea-state assessments:1,410	100% ■Number of sea-state assessments:1,409

Environmental performance indices - Port authority

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
9. Hazardous goods (handling/ storage)	Total number of disasters		0 disaster		■Number of disasters: 0	■Number of disasters: 0
	Number of spill incidents		zero times		zero times	zero times
	Number of drills for emergency responses to spills		Within the harbor	≥2 time/year	2 time/year	2 time/year
			Outside the harbor	≥1 time/year	1 time/year	1 time/year
	Number of times the harbor area has been patrolled		≥5 time/day		5 time/day	5 time/day
	Frequency of joint supervision for harbor safety		≥5 time/year		5 time/year	5 time/year
10. Vessel refueling	Implementation rate of refueling operations	Ratio of refueling operations performed according to the “Regulations Governing Refueling Operations at Mailiao Harbor.	Onshore pipeline	100%	100% ■fuel refueling volume: 56,865kL ■diesel refueling volume: 9,795 KL	100% ■fuel refueling volume: 79,576 kL ■diesel refueling volume: 6,384 kL
			Oil barge	100%	100% ■fuel refueling volume: 18,756 kL ■diesel refueling volume: 0 kL	100% ■fuel refueling volume: 45,030 kL ■diesel refueling volume: 881 kL
			Vehicle	100%	No vehicle refueling operations	No vehicle refueling operations
	Implementation rate of refueling operations using an oil boom	Before a refueling vessel is connected to the pipeline during onshore refueling operations, the ratio of harbor staff performing the loading and unloading of oil-based products in accordance with related regulations in the “Regulations Governing the Loading and Unloading of Dangerous Goods at Mailiao Industrial Harbor.”	100%		100%	100%

Environmental performance indices - Primary stakeholder
(Formosa Petrochemical Corporation MAI-LIAO Terminal Department)

Issues	Index item	Calculation method	Index target	Index results	
				2021	2022
3. Energy and resource consumption	Exchange rate of lighting equipment	Total number of lamps changed ÷ Total number of lamps = Lamp exchange rate	100%	100% ■Replacement of 112 lamps(Accumulate)	
6. Harbor waste	General waste recycling rate	General waste recycling volume ÷ general waste volume removed × 100%	10%	45% ■General waste volume:829.35 tons ■General waste removed: 1,824.69 tons	45% ■General waste volume: 663.48 tons ■General waste removed: 1,459.75 tons

Environmental performance indices - Secondary stakeholder
(Government units: customs units, immigration units, quarantine units, security units; Other units: harbor tenants)

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
1. Air quality	Qualification rate of air quality (393 items, including acetaldehyde, acetic acid, acetonitrile, and acetone in the air)	Two monitoring vehicles are used to strictly control the values of various common air pollution indices. They periodically move to appropriate areas for sampling, and the sampled data are checked according to the following regulations governing harbor air pollutant concentrations. ■ The appendix table of the standards for the emissions at peripheral boundaries, which is attached to the fixed pollution source air pollutants emission standards. ■ Permissible concentration of hazardous substances in the air in a working environment with workers. ■ “Odor threshold of odorous substances at offshore industrial zone,” (CTCI, 1990). ■ Maximum incremental reactivity scale.	Monitoring frequency	≥1 time/year	1 time/year	1 time/year
			Qualification rate	100%	100%	100%

Environmental performance indices - Secondary stakeholder

(Government units: customs units, immigration units, quarantine units, security units; Other units: harbor tenants)

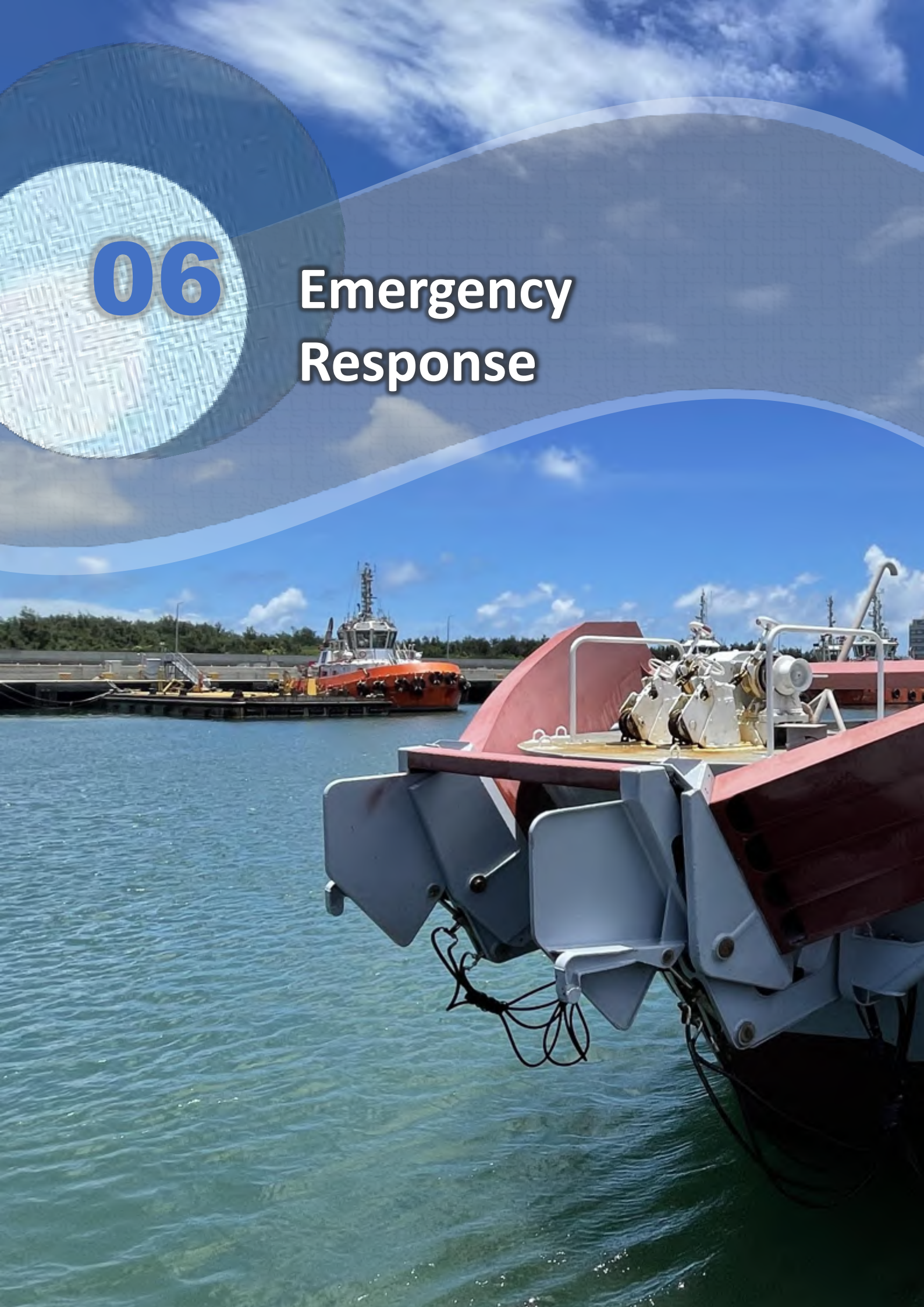
Issues	Index item	Calculation method	Index target	Index results	
				2021	2022
1. Air quality	Proportion of inbound ships using low-sulfur fuel (sulfur concentration: ≤0.5%) (Mailiao Harbor is an air quality maintenance zone, and its competent authority autonomously established a green transportation project)	The number of inbound ships using low-sulfur fuel ÷ the total number of inbound ships × 100%	100%	100%	100%
	Proportion of large diesel-powered vehicles conforming to emission standards in Q1–Q3 (Mailiao Harbor is an air quality maintenance area, and its competent authority autonomously established a green transportation project)	The number of inbound diesel-powered vehicles conforming to emission standards ÷ the total number of inbound diesel-powered vehicles × 100%	100%	100%	100%

Environmental performance indices - Other stakeholders

(Neighbors and fishers)

Issues	Index item	Calculation method	Index target		Index results	
					2021	2022
8. Habitat/ (marine) ecosystem	Regeneration of fishery resources (release of fry into adjacent sea areas)	Times of fry releasing	Release of fry : ≥ 1 time/year		1 time/year ■609,500 fry in total	1 time/year ■743,000 fry in total
[Others] community relations	Number of activities	Calculate the number of community feedback activities, or participation in seminars and promotional activities	Visiting	≥ 1 time/year	48 time/year ■Number of visitors: 1,657	144 time/year ■Number of visitors: 4,563
			Other	≥ 1 time/year	4 time/year ■Beach cleaning activities: 4 (Number of visitors: 1,044)	5 time/year ■Conferences: 2 ■Beach cleaning activities: 3 (Number of visitors: 783)
	Response rate to official website opinion letters	Number of reply letters ÷ number of submission letters × 100%	100%		100%	100%

06 Emergency Response

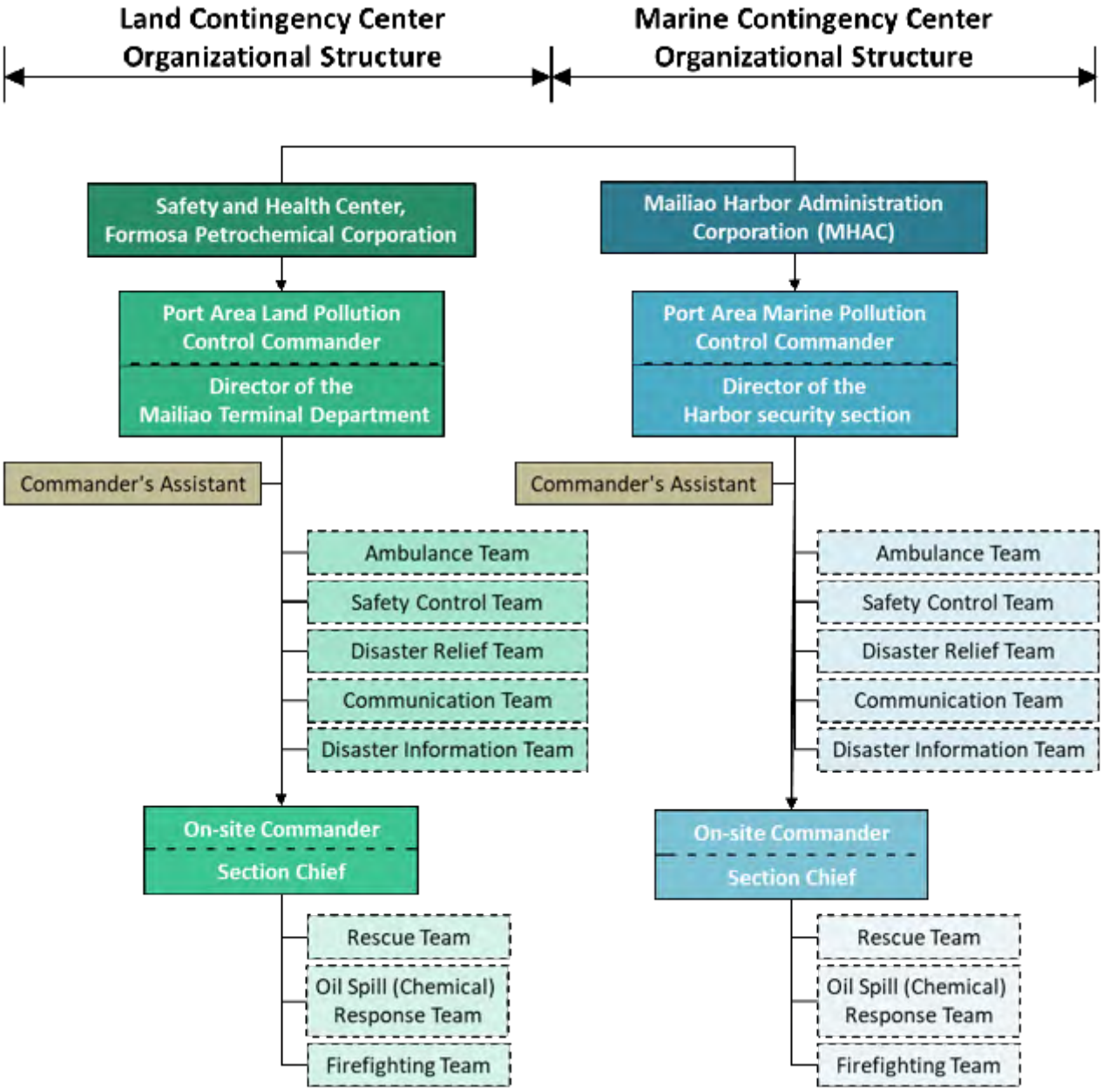



麥寮海洋 MAILIAO MARINE

Harbor emergency response

To prevent and mitigate accidents, as well as reduce the harm caused by them, Mailiao Port conducts regular emergency response drills for various potential accidents and strengthens emergency response measures for marine pollution. A comprehensive emergency response organizational structure has been established, adopting a three-stage response approach to ensure timely and appropriate handling of emergencies.

MHAC emergency response organization structure



Regular emergency response drills

To familiarize all staff members with emergency response operations during an accident, the harbor regularly implements simulation drills (every 6 months) according to the “Emergency Response Plan.” The emergency response drill plan includes the drill process and drill manual; explanations for the complete emergency response organization structure, operations flowchart, and notification process; and recovery operations and accident investigations after an accident. During the drill, all participating personnel must wear protective gear; thus, they learn how to use the various types of protective gear, and determine any problems for review. The drills are practiced in the hope of controlling a disaster in the shortest time possible after its occurrence, to prevent the disaster from spreading, and to minimize damage and threats. The drills are also hoped to instill disaster awareness in all staff, achieve process safety management, ensure process safety, and prevent disasters. Moreover, the identified areas of problem will be continually reviewed and improved to prevent similar abnormal events from reoccurring.

Emergency response for marine pollution

To prevent, eliminate, or reduce the impact of marine oil pollution emergency incidents on the ecological environment at Mailiao Harbor and the health and property of nearby residents, whenever an emergency incident of marine oil pollution is anticipated or has occurred, notification should be conducted immediately to implement response measures. The resources of government authorities, businesses, and co-operating businesses are integrated promptly and effectively to obtain pollution handling equipment, materials, and expert technicians, to achieve safe, immediate, effective, and coordinated response operations.

Therefore, to enhance the accident response ability of harbor staff, Mailiao Harbor co-ordinates with various authorities each year, holding various drills that include marine oil pollution and chemical disaster prevention to familiarize harbor staff with the marine pollution emergency notification system and to continually improve the system. Moreover, the harbor integrates and coordinates the resources and response operations of government authorities, businesses, and cooperating businesses, and establishes a joint defense system. Other measures implemented by the harbor include enhancing emergency response and handling capabilities for marine pollution incidents, and effectively preventing marine accidents or minimizing damage caused by marine accidents, thereby enhancing the accident response capability of the harbor area.

Through these marine pollution emergency response operations, the harbor has enhanced the familiarity of harbor staff with the notification process and clarified the division of responsibility during marine pollution emergencies for the most rapid response, and established better communications and mutual supporting channels between authorities, businesses, and cooperating businesses during marine pollution emergencies. Disaster rescue resources, labor, and equipment are used to enhance the overall disaster rescue capability and reduce impacts on humans, ecology, environment, and property. Moreover, the operations have enhanced the awareness of relevant operational personnel and the public regarding disaster management, specifically through workshops, training, drills, and concept promotion. A coordinated marine accident emergency response system was established, and the related procedures were formulated.

Offshore oil boom drill

Working boat assisting with handling of oil contamination

Mailiao Ocean

Furthermore, to enhance the emergency response capacity of the harbor, Mailiao Harbor purchased Taiwan's first offshore pollution cleanup vessel, named "Mailiao Ocean" It was manufactured by Ecoceane (France), and delivered to Taiwan in November 2015. The entire vessel is made of aluminum alloy, and it is lighter than a steel vessel. It features spark-free performance in collision accidents, providing superior safety. In the place of traditional oil skimmers, the vessel uses patented water tunnel system technology to suck oil floating on the ocean surface into the vessel, and then uses a physical method to separate the oil from water directly. The vessel can be moved to any other sea areas in Taiwan on the demand of the MOENV to assist in treating marine pollution in such areas.

As of 2022, practical implementation cases include assisting in handling the oil spill incident from the CPC Corporation's Dalin Refinery offshore oil transfer pipeline in June 2021, and will remain on standby to assist in emergency events.

Drill of oil spill collection by the vacuum drainage system of Mailiao Ocean

Passage planning in the pilot cabin

Marine communication system

Control room in Mailiao Ocean (1)

Control room in Mailiao Ocean (2)

Oil collection operation

07 Examples of Environmental Practices

Recycling of Waste Rock Wool

For industrial waste, Mailiao Harbor regularly and randomly inspects contractors' construction sites to ensure environmental compliance and is committed to recycling waste materials.

Mailiao Harbor has commissioned qualified contractors to process waste rock wool for resource recovery. The waste rock wool is crushed and mixture to produce recycled aggregate. Based on the requirements of end-users, the recycled aggregate is classified into different particle sizes, including 0-30 mm for backfill protection material used in road excavation and pipeline burial, classified as Controlled Low Strength Material (CLSM); and 30-100 mm for road subbase, backfill material, and concrete blocks with compressive strength of 90 or more. Furthermore, third-party certification agencies are involved to meet engineering requirements, ensuring continuous resource cycling and reducing the environmental burden of waste in the port area

Centralized Collection for Recycling

Transportation to Specialized Facilities for Processing

Reuse of processed waste rock wool

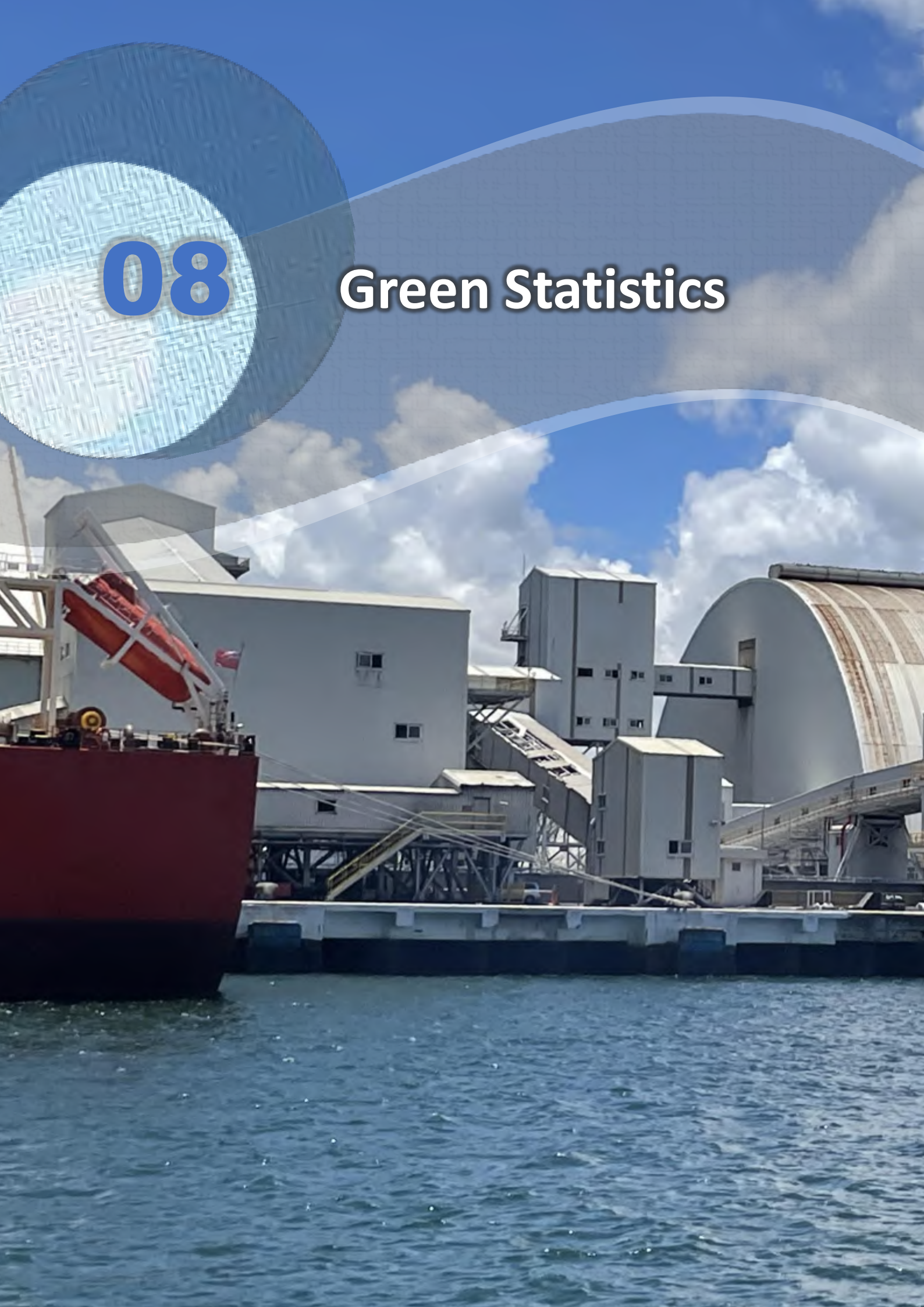
Environmental Education Promotion

Mailiao Harbor, in line with corporate social responsibility, utilizes limited social and natural resources to achieve environmental protection and community care. It continues to play a positive role in assisting social growth by promoting marine environmental ecological education activities extensively and over a long period. This includes visits by nearby schools' students and academic experts, participation in community activities by setting up promotion booths, regular opening of the port area for employee and family visits, and ongoing involvement in related activities.

- 2020/06/13 RE-THINK Beach Cleaning Campaign (Participation)
- 2020/09/29 Cleaning and Environmental Education Event at the Mouth of the Dajia River
- 2021/04/22 Earth Day - International Beach Cleaning Action
- 2021/09/25 Love Earth Beach Cleaning and Environmental Protection Awareness
- 2021/11/12 International Beach Cleaning Action
- 2021/12/10 Eco-friendly Habitat Xinxiwang (Participation/Sponsorship)
- 2022/07/23 National Marine Day Clean Beach Walk (Participation/Sponsorship)
- 2022/10/18 Promote "Conservation of Taiwan's Horseshoe Crab" Environmental Education
- 2022/11/20 Salute to the Sea Beach Cleaning Activity (Participation)

An environmental ecology established to showcase Mailiao Harbor's adherence to ecological protection standards. Through experiments conducted in this laboratory, they ensure Formosa Plastics Group's commitment to marine environmental friendliness. Additionally, the Mailiao Park area has renovated the "Mailiao Ecological Park Exhibition Hall" which which displays effort devoted to environmental protection such as ongoing environmental air quality monitoring, ocean friendly water reuse, coastal fisheries resource restoration in response to government initiatives, and corporate waste recycling promotion. A diverse and interactive environmental education programs will be developed as an important part of giving back to society.

08 Green Statistics



Environmental Investment and Costs

The costs of investment for Mailiao Harbor in environmental issues could be classified into employees, environmental maintenance and management, environmental monitoring, emergency response, and communication and publications. The goal was to enhance the environmental awareness of employees, maintain harbor area environment and enhance quality, increase emergency response ability, and enhance public understanding of the harbor. The various costs are explained as follows:

- **Employees:** The staff costs for hiring employees handling environmental affairs and the expenses of environmental education and training
- **Environmental maintenance and management:** Harbor area landscaping, waste removal, and harbor dredging
- **Environmental monitoring and planning:** Environmental monitoring such as air, noise, water quality, sediment, dredging, and environmental patrol; planning focused on the harbor's environmental protection objectives or measures
- **Emergency response:** Accident handling expenses, and verification expenses for materials and dangerous substances polluting the harbor area
- **Communications and publications:** Website maintenance, promotional activities, and environmental publications

The total costs of investment for Mailiao Harbor in 2021 and 2022 were NT$ 1,497,870,598 and NT$ 1,482,891,892, respectively, equaling approximately 44.93 million Euros and 44.48 million Euros. The following table presents the detailed cost breakdown.

The cost of investment of Mailiao Harbor toward environmental issues in 2021 and 2022

(Unit: NT$)

Expenses	2021	2022
Employees	449,209,807	444,717,709
Environmental maintenance and management	986,546,434	976,680,969
Environmental monitoring and planning	51,609,127	51,093,035
Emergency response	2,699,730	2,672,733
Communications and publications	7,805,501	7,727,446
Total	1,497,870,598	1,482,891,892

Environmental Assets

To develop the harbor into an environmentally friendly green port, Mailiao Harbor invested considerable fixed assets toward tackling environmental issues to promote harbor development and renewal. The total amount of fixed assets invested by Mailiao Harbor toward environmental issues in 2021and 2022 was NT$ 38,800 and NT$ 557,452,678, respectively, equaling approximately 1,164 Euros and 16,720,000 Euros.

Assets invested by Mailiao Harbor toward environmental issues in 2021 and 2022

(Unit: NT$)

Year	Type of asset	Item	Amount	Total
2021	Machine and equipment	Industrial-grade handheld computer	38,800	38,800
2022	Machine and equipment	Inflatable oil containment boom	2,980,000	557,452,678
		Broadcast system equipment	176,000	
		Industrial-grade handheld computer	36,800	
	Transportation and communication equipment	Mailiao Harbor 5000 HP tugboat	553,381,878	
		Government vehicle (BQR-7181)	878,000	

09 Innovation and Cooperation

Participating and Collaborating Organizations

Academic institutions

Taiwan Hydraulics Laboratory, National Cheng Kung University

This specialized research institution was formed through collaboration between the Water Resources Agency, Ministry of Economic Affairs, and National Cheng Kung University. It has been commissioned by the Industrial Development Bureau, Ministry of Economic Affairs, for over 20 years to conduct the Environmental Monitoring Plan in Yunlin's coastal areas. Consequently, it possesses in-depth knowledge of environmental trends in Yunlin's coastal regions and has supported the MHAC in obtaining green port certification from the European Sea Ports Organization.

Coastal Water and Environment Center, National Kaohsiung University of Science and Technology

The university was tasked with conducting the Wave Monitoring Plan in Mailiao Harbor. Analyzing the measured wave data, the university developed guidelines for ship docking during swells, with the goal of ensuring ship and harbor facility safety. It provided measured wave data to the MAI-LIAO Terminal Department as a reference for issuing warnings, halting loading/unloading operations, or disconnecting hoses when necessary. This proactive approach prevents loading arm breakage and spills due to wave-induced stresses.

Government authorities

Environmental Protection Bureau, Yunlin County

- Collaborated with Yunlin County's Environmental Protection Bureau to inspect Mailiao Harbor and its ships.
- Participated in the 2021 emergency drill for marine pollution held in Mailiao Harbor.
- Coordinated the 2022 Yunlin emergency drill for marine pollution with organizations.

Environmental Protection Bureau, Chiayi County

- Participated in the "2021 Chiayi County Marine Oil Pollution Response and Regional Search and Rescue Drill"

Taiwan Centers for Disease Control

- In 2021 and 2022, the Taiwan Centers for Disease Control hosted the COVID-19 Prevention Measures Promotion Event over 5 sessions.
- Organized the "Mailiao Harbor PCR Sampling Explanation Meeting 2022" with one session held.

Maritime and Port Bureau, Ministry of Transportation and Communications Central Taiwan Maritime Affairs Center

- Assisted in on-board inspections with the Central Taiwan Maritime Affairs Center at Mailiao Harbor.
- Joined the Ocean Affairs Council for the "2022 Changhua Wind Farm Navigational Channel Maritime Disaster Rescue Military Exercise."

Yunlin County Fire Department

- Participated in the 2021 emergency drill for marine pollution held in Mailiao Harbor.
- Participated in the 2022 emergency drill for marine pollution held in Mailiao Harbor.

Foundations and consulting companies

Sinothch Engineering Services, Ltd.

Sinotech Engineering Services, Ltd. was commissioned by MHAC to conduct the Green Port/EcoPort Certification Plan for Mailiao Harbor, helping Mailiao Harbor Administration Corporation apply for certification as a green, ecofriendly port from the European Sea Ports Organization.

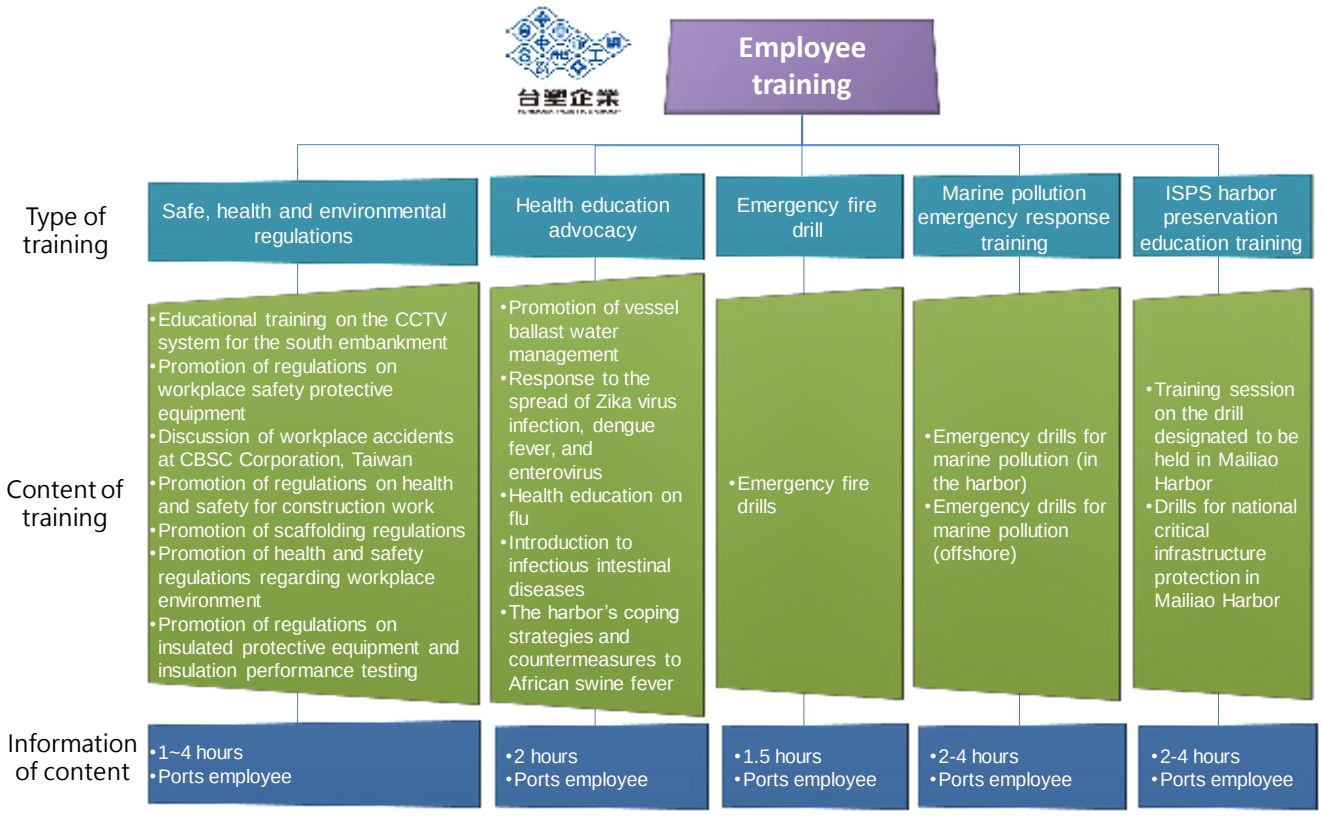
10 Training

Employee Training

Increasing environmental awareness in recent years has prompted Formosa Plastics Group, to recognize environmental protection as a public concern. Today, environmental education is an emerging public movement. However, the public generally considers factories or businesses to be the main sources of environmental pollution. Therefore, this company constantly improves and enhances its measures of pollution prevention, and believes that its duty is to educate the public. Thus, implementing comprehensive corporate environmental education provides the company and its workers with a joint target, namely to enhance the environmental literacy of its employees and the people's sense of identification with this place, thereby enabling everyone to learn more about this company.

Employee training and education in Mailiao harbor can be divided into five parts: "Safe, health and environmental regulations" "Health education advocacy" "Emergency fire drill" "Marine pollution emergency response training" "ISPS harbor preservation education training". The total training hours is 6,518 man-hour in 2021 and 6,309 man-hour in 2022.

Mailiao harbor employee training contents



Employee training situation from 2021 to 2022

(Unit: man-hour)

Curriculum Field	Harbor		Terminal Department	
	2021	2022	2021	2022
Safe, health and environmental regulations	1,681	1,159	3,150	2,526
Health education advocacy	110	230	178	310
Emergency fire drill	124	124	178	310
Marine pollution emergency response training	640	936	60	60
ISPS harbor preservation education training	397	654	-	-
Total	2,952	3,103	3,566	3,206

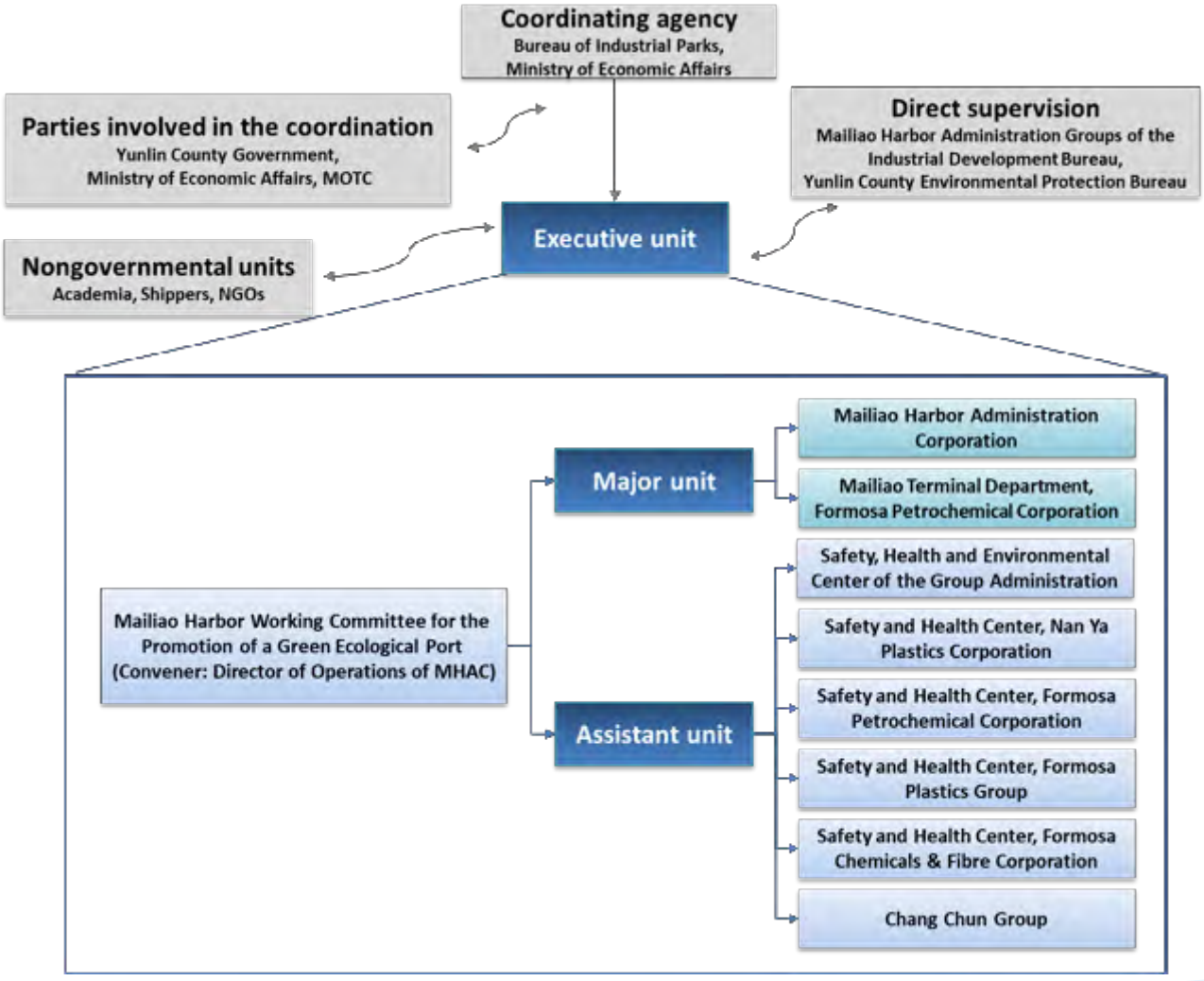
Furthermore, the “Mailiao Harbor Working Committee for the Promotion of a Green Ecological Port” was formed to advance a variety of green port work. This committee comprised major unit and assistant unit. Major unit include the Mailiao Harbor Administration Corporation; Mailiao Terminal Department, Formosa Petrochemical Corporation. Assistant unit include the Safety, Health and Environmental Center of the Group Administration of Formosa Plastics Group; the Safety and Health Management Office of Nan Ya Plastics Corporation; the Safety and Health Management Office of Formosa Petrochemical Corporation; the Safety and Health Management Office of Formosa Plastics Group; the Safety and Health Management Office of Formosa Chemicals & Fibre Corporation; and the Chang Chun Group. Mailiao harbor’s environmental policy and its concept to the internal members and the public was as follows.

- Internal

  1) We have held the regular meeting of the industrial safety and the environmental protection every month. We continue to convey the environmental policy and the concept to the employee at the meeting.
  2) We invited the employee and their family to visit the harbor regularly that we can communicate the concept of the environmental policy.

- External (the public)
  1) We have held the regular meeting with contractors every month.
  2) The exclusive page of the Eco-Parts, including the environmental policy and the environmental report, has shown on our official website.
  3) The experience of the Eco-Ports certification of our harbor was published on the 40th Ocean Engineering Conference of Taiwan.
  4) We have hosted the coordination meeting for Eco-ports every quarter at least.
  5) We continue to invite the government groups, the local communities, and the academic institutions to visit our harbor.

Accountability chart of the units managing Mailiao Harbor's environmental issues



11 Communications and Publications

Community Activities

In order to maintaining a good environment, Formosa Plastics Group is committed to community engagement and contributes significantly to society, fulfilling its corporate responsibility of fostering neighborly relations.

Ocean Environment Protection: Organizing beach cleaning activities

Formosa Plastics Group remains committed to environmental conservation and corporate environmental responsibilities. It collaborates with local government agencies, environmental organizations, academic institutions, and communities to organize beach cleaning activities. Since 2019, regular beach cleaning has been carried out in the northern dike area and the mouth of the Dajia River. A yearly budget of 4 million is allocated for this purpose, with staff dispatched 2 to 3 days per week. To date, a total of 36.4 tons of waste has been removed by over 3,000 participants.

Free Vaccinations: Enhancing student health protection

To improve cervical cancer protection among women in Yunlin County, Formosa Plastics Group collaborated with the county government to promote the HPV 9-valent vaccine for female students in junior high school. This initiative increases cervical cancer protection from 70% to 90%. From 2020 to 2022, a total of 28.78 million was donated, benefiting nearly 8,000 individuals.

Local Infrastructure Support: Contributing to community development

Formosa Plastics Group donated millions to support local projects, including the Elderly Learning Center (9 million), a bone-receiving tower (53.2 million), renovations at Feng'an Elementary School (52.16 million), and the establishment of the Mailiao Head Bridge Library (31.06 million). These contributions improve infrastructure, show ongoing commitment to the community, and enhance residents' quality of life.

Conference

Ocean Engineering Conference in Taiwan

Mailiao Harbor showcased its green port success at the 44th Ocean Engineering Symposium in 2022. It actively contributed submissions to share its certification experiences, promote the sustainable management philosophy of Mailiao Harbor, and continuously review the port's current status and implementation of the ten major environmental issues through certification operations. This effort aims to convey Mailiao Harbor's long-standing commitment to port environmental management and ecological protection, as well as facilitate exchanges with experts and scholars in the field.

The Experience of Eco-ports Certification for Mailiao Industrial Harbor

ABSTRACT

Air Pollution Reduction and Environmental Sustainability Forum

In order to actively promote carbon neutrality, green energy technologies, and sustainable environmental development, Formosa Plastics Group held the "Air Pollution Reduction and Environmental Sustainability Forum" on July 20, 2022, at the Sixth Naphtha Cracker Plant Industrial Zone in Mailiao Township, Yunlin County. During the forum, Formosa Plastics Group and the Yunlin County Government jointly signed the "Carbon Neutrality and Green Energy Technologies for Sustainable Environment" declaration. The declaration plans for a circular economy, promotes energy improvements, integrates equipment upgrades and process improvements, and aims for net zero carbon emissions by 2050.

Publications/Promotional Material

Mailiao Harbor introduction

The Mailiao Harbor introduction introduces the background information of the harbor, including the harbor's location, an aerial view of the harbor, the harbor's history, operations characteristics, administration organization structure, and berths on operation.

Key statistics of Mailiao Harbor

The key statistics of Mailiao Harbor includes the information of the number of vessels and the amount of cargo entering and exiting the port every year, and facts about stevedoring, financial affairs, organizational staff, and port facilities.

Environmental report

The report described Mailiao Harbor's ecological efforts from 2019 to 2020 and the Mailiao Harbor Administration Corporation's environmental policy, objectives, pledges, and action plans for green port development.

Formosa Plastics Group Magazine

Bringing together the latest developments of Formosa Plastics Group, showcasing its ongoing efforts in environmental improvement, corporate sustainability, community contributions, and port sustainability. It also promotes related arts and culture columns and other initiatives.

Environmental protection map

The map presents the Formosa Petrochemical Corporation persistence in care for the Earth, advertisement of ecological and conservation concepts, and dedication to comprehensive and advanced facilities for environmental protection.

Websites

Mailiao Harbor website

The information found there includes the purpose of establishing the harbor, harbor operations, services, harbor status, and harbor news. The website is available to the public.

http://www.mlharbor.com.tw/j2mlh/zhtw/index.do

http://www.mlharbor.com.tw/j2mlh/enus/index.do

Mailiao Harbor real-time movement of vessels

http://59.125.77.209/DSS/published-harbor

Facebook - Formosa Plastics Group!

(From: Facebook)

Formosa Plastics Group integrates various matters related to the Mailiao Industrial Park and provides real-time environmental information through Facebook social media. This information includes port disaster prevention drills, environmental education, harbor ecosystem updates, and air quality alerts, thereby expanding the network of communication with stakeholders connected to the port.

https://www.facebook.com/FormosaPlasticsGroup?mibextid=WC7FNe&rdid=GEdEhQUISn6iP7ao

The beauty of Mailiao Eco-industrial Park, FPG

Formosa Plastics Group transforms desolation into prosperity, embracing the spirit of responsibility by prioritizing environmental protection, offering healthcare to locals, engaging with the community, and supporting the fishing industry. Join us in celebrating the beauty of Mailiao Eco-industrial Park!

六輕之美

http://mailiao.fpg.com.tw/j2pk/sea.do

12 Future Prospects

Mailiao Harbor is the first industrial harbor in Taiwan funded and managed by enterprises. It officially began operations in 2001, and since then, has become the largest industrial harbor in the country.

Even though Mailiao Harbor already used low impact sand extraction and landfilling measures during the harbor construction stage to minimize potential impacts on marine and coastal ecology, pollution discharge during operations such as vessels entering and exiting the harbor, mooring, stevedoring warehousing, and refueling, remain unavoidable. Other operations that could generate pollution include moving heavy machinery on harbor land at the terminal and warehousing areas, which may deteriorate the environmental quality of the harbor.

To reverse environmental deterioration and maintain the international trend of green, ecofriendly ports, the Mailiao Harbor Administration Corporation has actively implemented measures for green port implementation, namely reducing pollution in the harbor, maintaining the ecosystem, improving the operational effectiveness of the harbor, and increasing benefits to local communities. Certified as a green, ecofriendly port for the first time in September 2018, it will continue its efforts to implement environmental policy for harbors and to promote green, ecofriendly certification with the aim of green, ecofriendly, and sustainable port development.

Appendix 1 - monitoring results of marine water quality near Mailiao

◢2021 Q1 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			0.0	6.5	13.0	0.0	10.0	20.0	0.0	12.5	23.0	0.0	11.0	22.0
Tepm.	℃	—	—	15.4	15.3	15.2	15.3	15.3	15.2	15.6	15.6	15.6	15.8	15.8	15.8
Salinity	PSU	—	—	33.3	33.4	33.3	33.3	33.3	33.3	33.5	33.5	33.5	33.5	33.5	33.5
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.0	8.0	8.1	8.0	8.1	8.1	8.0	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.7	6.7	6.7	6.6	6.4	6.5	6.6	6.5	6.3	6.7	6.4	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.12	1.05	1.09	1.03	0.75	1.02	0.99	0.89	0.81	1.21	0.9	1.46
E. coli	CFU/100ml	≤ 1000	≤ 1000	30	15	25	70	20	10	30	15	50	<10	<10	<10
S.S.	mg/L	—	—	21.8	34.6	69.3	28.7	31.6	38.1	32.8	29.2	30.0	60.0	53.1	48.2
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	1.05	ND	ND	ND	ND
Mineral oil	mg/L	2	2	1.4	ND	0.6	0.6	1.5	1.0	1.1	0.8	0.6	0.6	1.3	0.8
Chlorophyll a	μg/L	—	—	0.296	0.889	0.889	0.592	0.592	0.296	ND	ND	ND	ND	ND	ND
Total phosphorus	mg/L	0.05	0.05	0.029	0.023	0.026	0.034	0.019	0.020	0.019	0.035	0.023	0.024	0.029	0.023
NH3-N	mg/L	0.3	0.3	0.12	0.13	0.12	0.13	0.11	0.12	0.11	0.11	0.10	0.10	0.10	0.11
Nitrite nitrogen	μg/L	—	—	24.49	20.68	23.27	22.66	21.59	21.29	20.98	18.69	12.28	15.49	10.90	13.35
Nitrate nitrogen	mg/L	—	—	0.24	0.20	0.22	0.19	0.19	0.19	0.18	0.20	0.19	0.17	0.17	0.17
Cd	μg/L	10	5	0.0314	0.0358	0.0328	0.0463	0.0401	0.0291	0.0214	0.0395	0.0118	0.0389	0.0292	0.0162
Cr	μg/L	—	—	0.29	0.24	0.37	0.21	0.24	0.27	0.21	0.63	0.15	0.20	0.23	0.33
Co	μg/L	—	—	0.09	0.07	0.06	0.09	0.07	0.07	0.04	0.05	0.06	0.04	0.05	0.05
Cu	μg/L	30	30	0.156	0.624	0.708	1.043	0.245	0.784	0.264	0.608	1.681	1.087	0.307	0.442
Ni	μg/L		100	0.199	0.187	0.268	0.708	0.228	0.311	0.132	0.343	0.139	0.216	0.246	0.268
Pb	μg/L	100	10	0.019	0.066	0.033	0.111	0.057	0.058	0.044	0.071	0.036	0.035	0.068	0.027
Zn	μg/L	500	500	1.336	1.549	0.233	1.711	1.500	0.692	0.895	2.596	0.334	2.067	0.733	0.835
Fe	μg/L	—	—	2.30	1.22	4.41	3.29	2.30	1.84	0.34	3.18	3.07	1.41	1.07	1.07
As	μg/L	50	50	0.42	0.68	0.42	0.47	0.40	0.53	0.58	0.60	0.48	0.83	0.68	0.73
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	14.7	23.8	55.3	14.0	23.1	23.6	10.9	20.8	21.6	14.9	26.9	23.2
Transparency	m	—	—		0.4			0.5			0.3			0.3	
Silicate	mg/L	—	—	0.64	0.68	1.29	0.88	0.82	0.90	0.30	0.40	0.59	0.63	0.60	0.65
Total oil	mg/L	—	—	2.8	3.5	3.6	3.5	3.1	3.7	3.2	2.4	2.5	2.5	2.8	2.6

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q1 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			0.0	11.5	23.0	0.0	1.5	3.0	0.0	1.5	3.0	0.0	10.0	20.0
Tepm.	℃	—	—	16.3	16.3	16.3	15.7	15.7	15.7	15.4	15.4	15.4	15.4	15.3	15.3
Salinity	PSU	—	—	33.5	33.5	33.5	33.3	33.3	33.3	33.3	33.3	33.3	33.3	33.4	33.4
pH	-	7.5~8.5	7.5~8.5	8.1	8.0	8.0	8.0	8.0	8.0	8.1	8.1	8.0	8.0	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	7.0	6.4	6.4	6.8	6.4	6.5	6.6	6.5	6.4	6.5	6.9	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.33	0.83	1.12	1.2	1.11	0.85	1.2	0.99	0.78	0.92	1.16	1.03
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	20	25	65	<10	<10	10	<10	70	<10
S.S.	mg/L	—	—	37.5	68.2	52.3	69.3	123.5	146.5	63.2	42.3	61.1	29.7	43.2	39.6
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	1.4	0.5	ND	0.5	0.8	1.6	1.2	0.8	1.6	ND	1.2
Chlorophyll a	μg/L	—	—	0.592	0.296	0.592	1.185	0.889	1.185	0.592	ND	ND	1.481	0.889	0.592
Total phosphorus	mg/L	0.05	0.05	0.017	0.020	0.022	0.030	0.024	0.018	0.038	0.038	0.032	0.024	0.029	0.024
NH3-N	mg/L	0.3	0.3	0.09	0.09	0.07	0.14	0.07	0.11	0.14	0.13	0.09	0.07	0.07	0.06
Nitrite nitrogen	μg/L	—	—	6.78	4.03	8.92	20.68	23.27	20.83	18.39	17.93	21.29	15.79	14.72	16.71
Nitrate nitrogen	mg/L	—	—	0.14	0.15	0.13	0.19	0.21	0.23	0.13	0.18	0.18	0.22	0.25	0.19
Cd	μg/L	10	5	0.0279	0.0565	0.0358	0.0451	0.0525	0.0387	0.0481	0.0357	0.0330	0.0384	0.0330	0.0310
Cr	μg/L	—	—	0.19	0.47	0.30	0.28	0.30	0.15	0.39	0.27	0.28	0.19	0.19	0.29
Co	μg/L	—	—	0.02	0.03	0.03	0.12	0.10	0.12	0.07	0.06	0.06	0.07	0.06	0.06
Cu	μg/L	30	30	0.282	0.729	0.357	0.446	0.327	1.604	0.970	0.255	0.684	0.371	0.565	0.389
Ni	μg/L		100	0.374	0.140	0.063	0.231	0.077	0.456	0.464	0.177	0.173	0.343	0.349	0.174
Pb	μg/L	100	10	0.043	0.034	0.020	0.042	0.021	0.029	0.068	0.048	0.026	0.066	0.064	0.023
Zn	μg/L	500	500	1.285	1.584	1.800	0.837	0.365	0.864	1.684	1.080	0.730	2.046	2.617	0.687
Fe	μg/L	—	—	2.18	3.53	2.10	1.93	0.77	1.94	1.15	0.88	1.90	4.46	2.39	1.46
As	μg/L	50	50	0.93	0.58	0.65	0.48	0.48	0.46	0.51	0.55	0.51	0.50	0.77	0.59
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	14.5	15.9	27.3	50.3	82.5	100.0	30.8	36.9	35.7	9.3	33.0	32.7
Transparency	m	—	—		0.5			0.5			0.5			0.5	
Silicate	mg/L	—	—	0.78	0.67	0.59	1.11	0.92	0.83	0.77	0.76	0.89	0.63	0.49	0.70
Total oil	mg/L	—	—	3.6	2.2	3.7	4.0	4.2	2.3	3.2	3.2	3.3	3.1	3.1	2.9

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q1 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			0.0	11.0	22.0	0.0	11.5	23.0	0.0	0.0	0.0
Tepm.	℃	—	—	16.0	15.9	15.9	16.9	15.9	15.9	16.3	15.5	15.3
Salinity	PSU	—	—	33.4	33.4	33.4	33.6	33.6	33.4	33.2	33.3	33.2
pH	-	7.5~8.5	7.5~8.5	8.0	8.0	8.1	8.1	8.0	8.1	8.0	8.0	8.0
D.O.	mg/L	≥ 5.0	≥5.0	7.0	6.7	6.5	6.6	6.4	6.7	6.9	6.9	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.27	1.05	1.1	1.19	0.83	1.07	1.24	0.95	0.97
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	65	<10	30
S.S.	mg/L	—	—	25.5	27.0	35.1	19.4	21.7	26.4	67.1	49.7	27.8
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	2.73	ND	1.05
Mineral oil	mg/L	2	2	0.6	0.6	0.5	1.6	0.7	1.3	0.9	1.4	ND
Chlorophyll a	μg/L	—	—	0.296	0.592	0.296	0.296	0.296	0.592	ND	0.296	0.296
Total phosphorus	mg/L	0.05	0.05	0.017	0.008	0.013	0.019	0.015	0.013	0.033	0.022	0.037
NH3-N	mg/L	0.3	0.3	0.08	0.09	0.08	0.06	0.07	0.07	0.14	0.09	0.14
Nitrite nitrogen	μg/L	—	—	10.75	9.53	14.42	4.03	10.14	8.31	25.26	15.64	19.76
Nitrate nitrogen	mg/L	—	—	0.18	0.17	0.18	0.10	0.10	0.11	0.20	0.19	0.22
Cd	μg/L	10	5	0.0366	0.0287	0.0202	0.0146	0.0251	0.0101	0.0136	0.0301	0.0426
Cr	μg/L	—	—	0.21	0.49	0.22	0.18	0.41	0.60	0.15	0.25	0.25
Co	μg/L	—	—	0.04	0.04	0.05	0.03	0.03	0.03	0.14	0.08	0.09
Cu	μg/L	30	30	0.216	0.235	0.526	0.203	0.585	0.130	0.234	0.385	0.358
Ni	μg/L		100	0.173	0.182	0.438	0.051	0.214	0.085	0.105	0.320	0.232
Pb	μg/L	100	10	0.023	0.022	0.084	0.066	0.078	0.035	0.021	0.090	0.079
Zn	μg/L	500	500	0.718	3.235	1.146	2.227	1.597	0.930	0.360	1.484	1.472
Fe	μg/L	—	—	1.61	0.99	0.83	1.05	4.65	4.86	1.39	1.17	1.38
As	μg/L	50	50	0.84	0.77	0.78	0.66	0.72	0.65	0.60	0.69	0.85
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	12.4	18.1	25.0	7.3	10.9	11.7	46.5	28.9	18.1
Transparency	m	—	—		0.4			0.5		0.9	0.2	0.5
Silicate	mg/L	—	—	0.55	0.86	0.44	0.36	0.85	0.49	0.56	0.46	0.43
Total oil	mg/L	—	—	2.4	2.5	1.9	2.8	2.4	3.3	3.3	3.4	2.2

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q2 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			0.0	9.0	18.0	0.0	12.0	24.0	0.0	12.0	24.0	0.0	16.0	23.5
Tepm.	℃	—	—	25.0	24.9	24.9	25.2	25.2	25.2	25.1	25.1	25.1	25.5	25.5	25.5
Salinity	PSU	—	—	34.3	34.3	34.3	34.3	34.3	34.3	34.2	34.2	34.2	34.2	34.1	34.1
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	6.8	7.0	7.2	6.8	6.7	7.0	7.0	6.9	7.2	7.0	6.9
B.O.D.	mg/L	≤ 2	≤ 2	0.8	0.7	0.8	1.2	1.0	0.8	1.1	1.2	0.9	1.2	1.3	1.2
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	10.9	10.8	10.4	14.5	14.5	15.5	13.2	23.5	23.0	15.3	17.6	15.7
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	0.9	ND	0.6	0.7	ND	ND	0.9	0.5	0.6	0.8	ND	0.9
Chlorophyll a	μg/L	—	—	1.2	1.5	1.2	0.6	0.6	0.3	1.5	1.5	1.2	1.8	1.8	1.8
Total phosphorus	mg/L	0.05	0.05	0.019	0.018	0.019	0.013	0.018	0.012	0.028	0.034	0.017	0.010	0.025	0.010
NH3-N	mg/L	0.3	0.3	0.08	0.06	0.03	0.06	0.06	0.05	0.04	0.04	0.04	0.03	0.03	0.06
Nitrite nitrogen	μg/L	—	—	4.32	4.00	4.00	1.60	2.72	2.24	2.24	6.40	7.52	7.36	7.04	7.84
Nitrate nitrogen	mg/L	—	—	0.03	0.04	0.06	0.04	0.05	0.06	0.04	0.05	0.06	0.04	0.05	0.02
Cd	μg/L	10	5	0.0232	0.0258	0.0178	0.0465	0.0184	0.0441	0.0234	0.0284	0.0134	0.0153	0.0277	0.0251
Cr	μg/L	—	—	0.17	0.23	0.67	0.15	0.34	0.47	0.32	0.93	0.45	0.36	0.37	0.27
Co	μg/L	—	—	0.051	0.053	0.049	0.027	0.025	0.040	0.033	0.036	0.034	0.035	0.033	0.031
Cu	μg/L	30	30	0.425	0.406	0.460	0.374	0.377	0.575	0.371	0.860	0.434	0.369	0.528	0.375
Ni	μg/L		100	0.315	0.456	0.435	0.278	0.264	0.416	0.383	0.358	0.304	0.388	0.302	0.298
Pb	μg/L	100	10	0.094	0.134	0.067	0.067	0.086	0.092	0.083	0.156	0.063	0.087	0.064	0.041
Zn	μg/L	500	500	1.55	1.94	1.77	1.23	0.89	1.83	1.38	2.36	0.94	3.28	3.60	1.07
Fe	μg/L	—	—	2.38	3.73	5.00	3.06	2.62	3.29	3.79	5.35	3.80	4.36	3.52	3.32
As	μg/L	50	50	0.814	0.781	0.920	0.835	0.868	0.764	0.743	0.749	0.797	0.830	0.914	0.808
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	6.9	6.7	6.2	11.1	11.2	11.6	8.6	12.7	11.1	8.6	8.5	8.5
Transparency	m	—	—		1.5			0.8			1.5			1.5	
Silicate	mg/L	—	—	0.30	0.23	0.17	0.12	0.12	0.12	0.51	0.27	0.42	0.16	0.26	0.33
Total oil	mg/L	—	—	1.7	2.4	1.6	1.8	1.3	2.1	2.0	2.0	1.7	2.1	2.7	2.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q2 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			0.0	16.0	23.5	0.0	3.5	6.5	0.0	3.0	6.0	0.0	11.5	23.0
Tepm.	℃	—	—	25.4	25.5	25.4	25.1	25.1	25.1	25.1	24.9	24.9	25.2	25.1	25.1
Salinity	PSU	—	—	34.1	34.1	34.1	34.3	34.3	34.3	34.3	34.3	34.3	34.2	34.2	34.2
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	7.0	7.1	7.0	6.9	6.9	6.7	6.8	6.5	7.0	6.7	6.6
B.O.D.	mg/L	≤ 2	≤ 2	1.0	0.9	1.1	0.8	0.8	1.0	0.8	0.7	0.6	1.0	0.8	0.9
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	45	<10	<10	<10	<10	30	20
S.S.	mg/L	—	—	18.0	15.6	18.0	20.9	33.0	39.1	20.3	24.2	38.4	19.5	22.9	19.5
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	0.9	0.7	0.8	0.9	0.8	0.6	ND	ND	ND	ND	ND	0.6
Chlorophyll a	μg/L	—	—	1.5	1.8	1.5	2.4	3.0	2.4	1.5	1.5	3.0	1.8	2.1	1.8
Total phosphorus	mg/L	0.05	0.05	0.017	0.019	0.014	0.023	0.020	0.016	0.027	0.022	0.018	0.013	0.013	0.014
NH3-N	mg/L	0.3	0.3	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.08	0.11	0.05	0.02	0.02
Nitrite nitrogen	μg/L	—	—	6.88	7.20	5.12	4.00	4.64	3.20	2.56	2.88	4.00	1.60	3.04	1.28
Nitrate nitrogen	mg/L	—	—	0.04	0.05	0.03	0.10	0.04	0.04	0.02	0.03	0.03	0.02	0.03	0.03
Cd	μg/L	10	5	0.0267	0.0482	0.0104	0.0324	0.0310	0.0211	0.0162	0.0185	0.0113	0.0117	0.0126	0.0366
Cr	μg/L	—	—	0.28	0.28	0.28	0.31	0.19	0.20	0.43	0.53	0.28	0.53	0.43	0.58
Co	μg/L	—	—	0.030	0.027	0.031	0.053	0.050	0.039	0.039	0.048	0.041	0.035	0.039	0.043
Cu	μg/L	30	30	0.594	0.480	0.430	0.483	0.388	0.389	0.576	0.495	0.426	0.474	0.508	0.443
Ni	μg/L		100	0.445	0.562	0.516	0.363	0.357	0.530	0.260	0.402	0.395	0.488	0.294	0.384
Pb	μg/L	100	10	0.119	0.084	0.074	0.084	0.088	0.115	0.057	0.084	0.089	0.061	0.096	0.068
Zn	μg/L	500	500	3.70	2.06	1.10	1.31	1.42	1.47	2.04	2.42	1.22	0.92	1.74	1.56
Fe	μg/L	—	—	3.45	4.77	2.45	3.88	2.97	3.94	2.84	3.60	3.72	5.12	3.67	4.24
As	μg/L	50	50	0.704	0.783	0.674	0.860	0.843	0.820	0.783	0.837	0.922	1.016	0.743	0.774
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	7.7	8.4	8.1	15.2	22.4	27.0	8.3	14.2	26.8	10.4	10.1	10.2
Transparency	m	—	—		2.0			1.0			2.0			1.0	
Silicate	mg/L	—	—	0.23	0.27	0.34	0.37	0.24	0.27	0.36	0.25	0.29	0.40	0.24	0.17
Total oil	mg/L	—	—	1.8	2.8	2.6	3.4	2.8	2.2	2.0	1.9	3.0	3.0	2.6	2.3

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q2 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			0.0	9.0	19.5	0.0	9.0	18.0	0.0	0.0	0.0
Tepm.	℃	—	—	25.1	25.2	25.2	25.3	25.3	25.3	25.3	25.3	25.2
Salinity	PSU	—	—	34.0	34.1	34.1	34.0	33.9	33.9	34.3	34.3	34.1
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	7.2	6.9	6.7	7.0	6.7	7.0	7.3	7.2	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.0	0.9	1.0	1.0	0.8	1.1	1.3	1.2	1.1
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	19.2	15.9	19.4	19.1	33.5	29.9	27.1	37.5	17.1
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	2.97	ND	ND
Mineral oil	mg/L	2	2	ND	ND	ND	0.5	0.9	0.7	0.6	ND	ND
Chlorophyll a	μg/L	—	—	1.8	1.8	1.8	2.1	2.1	1.8	6.8	6.8	4.1
Total phosphorus	mg/L	0.05	0.05	0.013	0.025	0.009	0.010	0.012	0.014	0.022	0.036	0.028
NH3-N	mg/L	0.3	0.3	0.03	0.04	0.03	0.03	0.06	0.03	0.12	0.02	0.03
Nitrite nitrogen	μg/L	—	—	7.36	7.04	7.84	6.72	4.32	5.92	5.60	6.56	6.40
Nitrate nitrogen	mg/L	—	—	0.03	0.04	0.03	0.05	0.09	0.09	0.06	0.06	0.06
Cd	μg/L	10	5	0.0253	0.0130	0.0200	0.0251	0.0212	0.0230	0.0175	0.0284	0.0218
Cr	μg/L	—	—	0.48	0.57	0.36	0.31	0.46	0.36	0.33	0.23	0.42
Co	μg/L	—	—	0.040	0.047	0.041	0.045	0.091	0.107	0.047	0.043	0.049
Cu	μg/L	30	30	0.378	0.642	0.367	0.400	0.545	0.654	0.548	0.469	0.606
Ni	μg/L		100	0.348	0.312	0.278	0.451	0.534	0.449	0.645	0.443	0.427
Pb	μg/L	100	10	0.119	0.046	0.037	0.145	0.300	0.149	0.234	0.053	0.054
Zn	μg/L	500	500	1.05	3.19	0.93	2.65	3.98	3.07	4.62	0.75	1.34
Fe	μg/L	—	—	4.27	3.49	3.90	4.53	4.27	4.23	3.20	4.59	4.54
As	μg/L	50	50	0.853	0.897	0.762	0.774	0.766	0.753	0.939	0.666	0.824
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	8.7	8.8	11.6	12.1	20.1	18.0	22.3	28.3	9.1
Transparency	m	—	—	1.5			1.0			0.5	0.5	0.5
Silicate	mg/L	—	—	0.43	0.50	0.30	0.58	0.47	0.43	0.11	0.05	0.31
Total oil	mg/L	—	—	2.9	2.8	2.6	1.9	3.0	2.4	1.6	3.0	2.2

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q3 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			0.0	8.0	16.5	0.0	11.0	21.0	0.0	12.0	24.0	0.0	16.0	23.5
Tepm.	℃	—	—	28.9	28.9	28.9	29.0	28.9	28.9	29.1	29.1	29.1	29.0	28.8	28.7
Salinity	PSU	—	—	33.2	33.1	33.2	33.1	33.1	33.1	33.2	33.2	33.2	33.4	33.4	33.4
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.2	8.1	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	7.0	6.8	7.2	7.1	7.0	7.1	7.1	6.8	6.8	7.0	6.8
B.O.D.	mg/L	≤ 2	≤ 2	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.0	0.9	0.9	0.9	1.0
E. coli	CFU/100ml	≤ 1000	≤ 1000	25	<10	<10	30	30	10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	8.6	8.6	12.9	8.8	15.8	11.0	12.2	9.2	10.1	9.0	7.8	9.0
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	ND	0.6	ND	0.5	0.5	ND	ND	ND	0.5	ND	ND
Chlorophyll a	μg/L	—	—	3.0	3.0	3.6	3.3	3.0	3.0	1.8	1.8	2.1	0.9	1.5	0.9
Total phosphorus	mg/L	0.05	0.05	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01
NH3-N	mg/L	0.3	0.3	0.09	0.05	0.02	0.04	0.05	0.15	0.06	0.03	0.05	0.15	0.04	0.08
Nitrite nitrogen	μg/L	—	—	3.65	2.38	1.74	1.74	1.43	3.33	1.27	3.17	4.60	4.12	3.65	2.69
Nitrate nitrogen	mg/L	—	—	0.0345	0.0234	0.0246	0.0170	0.0182	0.0238	0.0341	0.0234	0.0202	0.0396	0.0249	0.0368
Cd	μg/L	10	5	0.07	0.0339	0.0322	0.0279	0.0256	0.0209	0.0239	0.0223	0.0143	0.0265	0.0251	0.0395
Cr	μg/L	—	—	0.78	0.65	0.54	0.61	0.59	0.42	0.65	0.24	0.30	0.26	0.38	0.22
Co	μg/L	—	—	0.077	0.072	0.075	0.067	0.063	0.057	0.057	0.045	0.045	0.057	0.064	0.059
Cu	μg/L	30	30	0.856	0.723	0.843	0.746	0.845	0.549	0.699	0.629	0.961	0.939	0.753	0.813
Ni	μg/L		100	0.543	0.505	0.477	0.407	0.429	0.403	0.440	0.377	0.389	0.306	0.386	0.339
Pb	μg/L	100	10	0.059	0.051	0.067	0.040	0.059	0.031	0.027	0.027	0.028	0.024	0.025	0.021
Zn	μg/L	500	500	1.89	2.16	1.71	0.75	0.87	0.94	1.06	0.91	0.96	0.51	0.82	0.83
Fe	μg/L	—	—	3.24	3.14	3.03	3.10	2.97	2.72	2.89	2.71	2.83	2.81	3.11	2.73
As	μg/L	50	50	0.909	1.075	0.805	1.029	0.965	0.878	1.011	0.959	0.919	0.793	0.745	0.812
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	1.1	3.1	1.1	2.2	3.0	2.4	5.1	1.9	2.3	1.6	2.7	1.1
Transparency	m	—	—		4.0			5.0			4.0			6.0	
Silicate	mg/L	—	—	0.16	0.24	0.18	0.19	0.13	0.15	0.41	0.35	0.22	0.22	0.14	0.13
Total oil	mg/L	—	—	1.0	2.8	2.5	2.3	2.1	2.5	1.9	2.8	2.8	2.3	2.1	2.4

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q3 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			0.0	16.0	23.5	0.0	3.5	6.5	0.0	3.0	6.0	0.0	11.5	23.0
Tepm.	℃	—	—	28.9	28.8	28.7	29.0	29.0	29.0	29.1	29.0	29.0	29.1	29.1	29.1
Salinity	PSU	—	—	33.4	33.4	33.2	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.2	33.2
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.8	6.8	6.7	7.1	7.1	7.1	7.2	7.0	7.0	6.9	6.9	6.9
B.O.D.	mg/L	≤ 2	≤ 2	0.6	0.6	1.1	1.1	1.0	0.9	1.2	0.8	1.1	0.8	1.2	1.0
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	45	25	15	25	20	35	<10	<10	<10
S.S.	mg/L	—	—	9.7	7.6	9.8	17.4	29.4	21.0	34.4	21.2	23.4	13.7	19.0	11.1
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.5	0.6	0.5	0.7	ND	ND	ND	ND	ND	ND	ND
Chlorophyll a	μg/L	—	—	0.6	0.6	0.9	4.4	3.6	4.7	4.1	4.1	5.3	2.4	2.1	2.1
Total phosphorus	mg/L	0.05	0.05	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01
NH3-N	mg/L	0.3	0.3	0.12	0.04	0.07	0.06	0.03	0.06	0.08	0.06	0.05	0.07	0.06	0.16
Nitrite nitrogen	μg/L	—	—	2.85	5.23	3.65	2.22	2.38	1.43	3.65	3.17	1.74	6.82	5.23	4.28
Nitrate nitrogen	mg/L	—	—	0.0325	0.0234	0.0305	0.0226	0.0210	0.0234	0.0249	0.0190	0.0178	0.0198	0.0269	0.0285
Cd	μg/L	10	5	0.0391	0.0158	0.0183	0.0264	0.0282	0.0578	0.0194	0.0594	0.0211	0.0485	0.0172	0.0201
Cr	μg/L	—	—	0.68	0.17	0.38	0.86	0.42	0.42	0.41	0.82	0.36	0.42	0.37	0.26
Co	μg/L	—	—	0.057	0.074	0.081	0.058	0.059	0.069	0.058	0.065	0.070	0.037	0.050	0.047
Cu	μg/L	30	30	0.712	0.662	0.630	0.736	0.820	0.861	0.949	0.916	0.746	0.858	0.759	0.700
Ni	μg/L		100	0.396	0.311	0.292	0.476	0.450	0.451	0.436	0.446	0.462	0.397	0.390	0.413
Pb	μg/L	100	10	0.029	0.029	0.033	0.072	0.052	0.041	0.043	0.038	0.035	0.056	0.032	0.028
Zn	μg/L	500	500	0.76	0.83	0.73	1.81	1.79	1.18	1.63	1.19	0.87	1.16	0.74	1.23
Fe	μg/L	—	—	3.02	2.42	2.82	2.83	2.99	3.52	2.89	3.42	3.23	2.90	3.03	2.98
As	μg/L	50	50	0.880	0.731	0.868	0.888	0.982	0.919	1.083	0.986	0.932	1.135	0.994	1.276
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	1.2	2.3	2.2	3.2	7.4	4.8	10.3	3.9	8.0	2.2	3.7	2.9
Transparency	m	—	—		7.0			3.0			2.5			3.5	
Silicate	mg/L	—	—	0.69	0.54	0.21	0.12	0.15	0.14	0.29	0.20	0.22	0.21	0.17	0.09
Total oil	mg/L	—	—	2.1	3.0	2.8	2.1	2.9	2.2	2.5	2.2	2.7	2.2	2.2	2.9

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q3 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			0.0	9.0	19.5	0.0	9.0	18.0	0.0	0.0	0.0
Tepm.	℃	—	—	29.0	29.0	29.0	28.9	28.9	28.9	29.3	30.1	29.1
Salinity	PSU	—	—	33.0	33.1	33.2	33.2	33.2	33.4	33.0	33.0	32.5
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2
D.O.	mg/L	≥ 5.0	≥5.0	7.0	7.1	6.9	6.9	6.8	6.9	7.3	7.3	7.0
B.O.D.	mg/L	≤ 2	≤ 2	1.0	1.2	0.9	1.0	1.1	1.0	1.6	1.6	0.9
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	160	100	80
S.S.	mg/L	—	—	16.4	8.4	16.9	11.3	12.5	29.1	26.4	34.7	19.2
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	1.39
Mineral oil	mg/L	2	2	ND	ND	ND	ND	ND	ND	0.5	ND	ND
Chlorophyll a	μg/L	—	—	2.1	2.4	2.4	1.5	1.5	1.5	9.5	8.6	4.4
Total phosphorus	mg/L	0.05	0.05	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.04
NH3-N	mg/L	0.3	0.3	0.12	0.12	0.08	0.10	0.08	0.15	0.05	0.10	0.20
Nitrite nitrogen	μg/L	—	—	2.85	5.23	3.33	3.33	2.38	2.38	1.90	1.90	3.33
Nitrate nitrogen	mg/L	—	—	0.0253	0.0230	0.0301	0.0305	0.0321	0.0242	0.0135	0.0186	0.0642
Cd	μg/L	10	5	0.0263	0.0311	0.0187	0.0225	0.0258	0.0165	0.0309	0.0284	0.0222
Cr	μg/L	—	—	0.43	0.28	0.16	0.33	0.38	0.41	0.32	0.37	0.31
Co	μg/L	—	—	0.053	0.042	0.029	0.070	0.089	0.093	0.063	0.051	0.048
Cu	μg/L	30	30	0.839	0.816	0.435	0.757	0.682	0.476	0.606	0.643	0.597
Ni	μg/L		100	0.252	0.268	0.210	0.308	0.311	0.304	0.422	0.419	0.348
Pb	μg/L	100	10	0.016	0.039	0.017	0.063	0.039	0.030	0.034	0.029	0.034
Zn	μg/L	500	500	0.28	0.52	0.41	0.80	0.40	0.35	0.98	0.85	0.95
Fe	μg/L	—	—	2.38	2.81	2.05	2.85	2.95	3.10	2.97	3.27	2.80
As	μg/L	50	50	0.872	0.971	1.023	0.967	0.776	1.096	0.901	0.847	1.372
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	3.9	2.4	2.4	3.2	1.5	8.5	6.7	11.6	6.1
Transparency	m	—	—		3.0			3.5		1.0	1.0	1.5
Silicate	mg/L	—	—	0.08	0.14	0.10	0.13	0.14	0.14	0.10	0.06	0.33
Total oil	mg/L	—	—	2.6	2.3	2.9	2.6	2.5	2.1	2.5	2.5	2.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q4 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			1.0	8.0	17.0	1.0	11.5	22.0	1.0	12.0	24.0	1.0	12.5	24.0
Tepm.	℃	—	—	30.1	30.0	30.0	30.1	30.0	30.0	30.2	29.9	29.9	30.2	30.0	30.0
Salinity	PSU	—	—	33.8	33.8	33.8	33.9	33.8	33.8	33.9	33.9	33.9	33.9	33.9	33.9
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	7.0	7.0	7.0	6.9	6.8	7.0	6.9	6.9	6.8	7.0	6.8	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.4	1.4	1.4	1.3	1.2	1.0	1.0	1.1	0.9	1.1	1.0	1.1
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	10	25	<10	<10
S.S.	mg/L	—	—	0.8	3.7	6.7	10.4	8.3	7.3	1.0	15.7	4.4	2.3	7.9	0.7
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.8	0.7	ND	0.8	ND	1.0	ND	0.8	ND	0.5	ND
Chlorophyll a	μg/L	—	—	1.5	1.5	1.0	0.7	1.0	1.3	0.6	1.1	1.2	1.6	1.0	0.7
Total phosphorus	mg/L	0.05	0.05	0.029	0.018	0.023	0.031	0.018	0.020	0.020	0.022	0.033	0.028	0.023	0.038
NH3-N	mg/L	0.3	0.3	0.09	0.06	0.09	0.06	0.05	0.11	0.17	0.15	0.08	0.05	0.10	0.06
Nitrite nitrogen	μg/L	—	—	21.20	29.17	13.39	18.01	19.29	22.00	5.58	21.20	15.78	6.69	9.56	11.96
Nitrate nitrogen	mg/L	—	—	0.03	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Cd	μg/L	10	5	0.0260	0.0173	0.0135	0.0187	0.0214	0.0228	0.0118	0.0097	0.0381	0.0241	0.0382	0.0195
Cr	μg/L	—	—	0.38	0.38	0.26	0.26	0.30	0.57	0.33	0.35	0.30	0.32	0.37	0.30
Co	μg/L	—	—	0.051	0.038	0.028	0.035	0.042	0.037	0.024	0.028	0.026	0.019	0.011	0.020
Cu	μg/L	30	30	1.526	1.916	0.591	0.648	1.368	0.665	0.760	0.336	0.820	0.292	0.137	0.328
Ni	μg/L		100	0.684	0.597	0.421	0.407	0.413	0.590	0.423	0.564	0.631	0.527	0.401	0.457
Pb	μg/L	100	10	0.132	0.112	0.053	0.068	0.073	0.085	0.084	0.093	0.091	0.026	0.048	0.066
Zn	μg/L	500	500	2.55	2.19	0.84	1.13	1.70	1.52	1.52	1.75	1.54	1.17	0.71	1.28
Fe	μg/L	—	—	3.18	2.99	2.47	3.03	5.32	4.02	1.19	3.90	3.67	4.07	4.52	4.10
As	μg/L	50	50	1.069	0.642	0.623	0.631	0.729	1.005	0.960	0.707	0.756	0.967	1.103	0.979
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	2.2	4.0	4.1	3.2	1.2	3.2	1.9	2.4	2.0	0.9	2.1	2.1
Transparency	m	—	—		2.0			2.5			5.0			4.5	
Silicate	mg/L	—	—	0.34	0.23	0.15	0.28	0.14	0.15	0.56	0.25	0.14	0.11	0.22	0.11
Total oil	mg/L	—	—	2.7	3.1	2.7	2.6	2.3	2.3	2.3	2.5	2.7	3.0	1.9	2.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q4 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			1.0	12.0	23.0	1.0	3.0	6.0	1.0	3.0	6.0	1.0	11.0	21.0
Tepm.	℃	—	—	30.1	30.0	29.9	30.2	30.2	30.2	30.2	30.2	30.2	30.1	30.1	30.1
Salinity	PSU	—	—	33.9	33.9	33.9	33.7	33.7	33.6	33.7	33.7	33.7	33.9	33.8	33.8
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	7.1	6.8	6.8	7.1	7.0	6.9	6.9	6.8	7.0	6.8	6.9	7.1
B.O.D.	mg/L	≤ 2	≤ 2	1.1	0.8	0.9	1.0	0.9	1.0	1.2	1.2	1.4	1.1	1.5	1.1
E. coli	CFU/100ml	≤ 1000	≤ 1000	20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	1.3	10.8	0.9	11.3	28.1	24.0	22.5	45.4	31.7	2.4	7.2	16.3
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.6	ND	0.6	0.8	ND	ND	0.5	0.5	0.5	ND	0.6
Chlorophyll a	μg/L	—	—	2.1	0.7	0.6	2.1	2.4	1.9	1.8	2.7	3.1	1.2	1.3	1.8
Total phosphorus	mg/L	0.05	0.05	0.015	0.016	0.018	0.029	0.020	0.023	0.019	0.026	0.020	0.028	0.026	0.022
NH3-N	mg/L	0.3	0.3	0.06	0.07	0.03	0.10	0.08	0.12	0.09	0.12	0.14	0.17	0.12	0.12
Nitrite nitrogen	μg/L	—	—	4.62	6.85	3.35	12.91	26.62	16.26	34.27	13.71	17.37	9.56	13.55	14.82
Nitrate nitrogen	mg/L	—	—	0.02	0.04	0.02	0.03	0.02	0.03	0.03	0.04	0.03	0.03	0.03	0.02
Cd	μg/L	10	5	0.0147	0.0198	0.0181	0.0130	0.0349	0.0338	0.0106	0.0108	0.0105	0.0151	0.0198	0.0064
Cr	μg/L	—	—	0.22	0.33	0.35	0.16	0.37	0.40	0.10	0.26	0.17	0.59	0.37	0.23
Co	μg/L	—	—	0.026	0.033	0.028	0.042	0.049	0.048	0.035	0.036	0.042	0.048	0.046	0.036
Cu	μg/L	30	30	1.007	0.920	0.598	0.421	1.162	1.411	0.432	1.279	0.420	1.444	1.313	0.506
Ni	μg/L		100	0.361	0.816	0.894	0.537	0.655	0.656	0.427	0.609	0.477	0.779	0.560	0.530
Pb	μg/L	100	10	0.062	0.073	0.069	0.037	0.073	0.081	0.068	0.057	0.047	0.054	0.058	0.033
Zn	μg/L	500	500	0.69	1.38	1.37	1.15	2.30	2.19	1.02	1.48	1.33	1.69	1.70	1.75
Fe	μg/L	—	—	4.69	5.05	3.17	1.81	2.14	2.54	1.16	1.64	0.93	3.64	3.38	2.26
As	μg/L	50	50	1.353	1.084	1.455	0.503	1.152	0.710	1.054	0.903	0.892	0.948	0.994	0.865
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	1.5	1.8	1.5	6.2	7.1	11.7	6.6	15.3	15.7	1.6	2.3	2.4
Transparency	m	—	—		4.0			2.0			0.8			2.5	
Silicate	mg/L	—	—	0.10	0.14	0.15	0.16	0.32	0.15	0.29	0.15	0.26	0.12	0.13	0.19
Total oil	mg/L	—	—	2.6	2.8	2.3	2.8	3.2	2.3	2.5	2.4	2.7	3.1	2.7	2.7

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q4 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			1.0	9.0	17.0	1.0	10.5	20.0	1.0	1.0	1.0
Tepm.	℃	—	—	30.1	30.1	30.1	30.1	30.1	30.1	30.4	30.3	30.2
Salinity	PSU	—	—	33.8	33.8	33.8	33.8	33.9	33.8	33.7	33.7	32.7
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.7	6.8	7.0	6.9	6.8	7.0	7.2	7.1	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.4	1.1	1.3	1.0	1.2	1.1	1.4	1.3	1.8
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	65
S.S.	mg/L	—	—	4.2	8.0	4.3	4.7	8.6	5.2	13.7	15.3	7.8
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	ND	0.5	0.5	ND	ND	0.8	ND	ND
Chlorophyll a	μg/L	—	—	0.7	0.9	1.6	0.7	1.5	1.3	2.5	3.7	0.4
Total phosphorus	mg/L	0.05	0.05	0.032	0.031	0.029	0.020	0.014	0.017	0.040	0.030	0.047
NH3-N	mg/L	0.3	0.3	0.08	0.09	0.08	0.09	0.11	0.08	0.19	0.06	0.26
Nitrite nitrogen	μg/L	—	—	25.34	7.81	8.61	7.01	5.90	6.06	14.35	30.13	21.20
Nitrate nitrogen	mg/L	—	—	0.03	0.02	0.03	0.03	0.04	0.02	0.04	0.04	0.08
Cd	μg/L	10	5	0.0118	0.0128	0.0109	0.0098	0.0145	0.0105	0.0120	0.0158	0.0210
Cr	μg/L	—	—	0.20	0.15	0.28	0.36	0.34	0.43	0.17	0.29	0.33
Co	μg/L	—	—	0.032	0.024	0.033	0.052	0.031	0.033	0.040	0.038	0.054
Cu	μg/L	30	30	0.827	1.275	0.531	1.168	0.622	0.477	0.487	0.689	0.541
Ni	μg/L		100	0.535	0.299	0.418	0.881	0.521	0.876	0.574	0.615	1.475
Pb	μg/L	100	10	0.070	0.032	0.043	0.028	0.039	0.019	0.086	0.045	0.037
Zn	μg/L	500	500	1.26	0.87	1.02	1.31	1.07	1.29	5.39	3.56	5.22
Fe	μg/L	—	—	4.45	4.07	3.15	3.65	4.24	4.67	2.40	3.78	4.36
As	μg/L	50	50	1.251	1.077	1.032	1.266	0.922	0.941	0.880	0.843	1.965
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	1.9	1.9	3.4	2.0	3.8	5.7	12.5	9.3	7.4
Transparency	m	—	—		2.0			2.0		0.8	1.0	0.5
Silicate	mg/L	—	—	0.11	0.09	0.09	0.11	0.13	0.10	0.23	0.20	0.43
Total oil	mg/L	—	—	2.7	2.7	3.1	2.3	2.6	2.6	2.7	2.0	2.9

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q1 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			1.0	7.5	15.0	1.0	11.0	22.0	1.0	11.5	23.0	1.0	11.5	23.0
Tepm.	℃	—	—	18.0	17.9	17.9	18.2	18.0	18.0	18.2	18.2	18.2	19.4	19.4	19.4
Salinity	PSU	—	—	33.6	33.6	33.6	33.7	33.7	33.7	33.7	33.7	33.7	34.1	34.1	34.1
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.4	6.4	6.4	6.8	7.0	7.1	6.8	6.9	7.1	6.6	6.7	6.6
B.O.D.	mg/L	≤ 2	≤ 2	0.7	0.8	0.9	1.2	1.3	1.3	1.1	0.7	1.3	0.7	0.8	0.8
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	10	<10	<10	10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	15.9	23.4	25.4	15.5	15.6	23.8	31.5	33.3	37.5	25.3	23.4	35.0
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.6	0.7	0.5	0.8	ND	1.0	ND	0.8	ND	ND	ND
Chlorophyll a	μg/L	—	—	1.0	0.9	0.9	1.2	0.9	0.7	0.9	0.9	0.9	0.9	0.9	0.9
Total phosphorus	mg/L	0.05	0.05	0.021	0.022	0.016	0.013	0.015	0.029	0.018	0.015	0.024	0.018	0.027	0.024
NH3-N	mg/L	0.3	0.3	0.17	0.09	0.18	0.06	0.09	0.19	0.13	0.12	0.04	0.04	0.01	0.06
Nitrite nitrogen	μg/L	—	—	14.37	13.35	13.52	24.17	16.06	17.91	12.68	17.75	14.87	18.25	11.66	10.99
Nitrate nitrogen	mg/L	—	—	0.05	0.03	0.05	0.05	0.09	0.10	0.04	0.04	0.04	0.05	0.05	0.05
Cd	μg/L	10	5	0.0549	0.0311	0.0234	0.0232	0.0238	0.0278	0.0219	0.0243	0.0235	0.0294	0.0408	0.0198
Cr	μg/L	—	—	0.45	0.45	0.22	0.89	0.66	0.88	0.22	0.25	0.51	0.46	0.73	0.68
Co	μg/L	—	—	0.040	0.049	0.014	0.052	0.018	0.058	0.015	0.031	0.015	0.055	0.063	0.048
Cu	μg/L	30	30	0.479	0.655	0.873	0.432	0.735	0.496	1.102	0.582	0.954	0.656	1.081	0.536
Ni	μg/L		100	0.680	0.635	0.315	0.797	0.480	0.922	0.212	0.229	0.287	0.537	0.969	0.936
Pb	μg/L	100	10	0.094	0.123	0.097	0.068	0.055	0.058	0.062	0.082	0.097	0.116	0.122	0.062
Zn	μg/L	500	500	0.77	1.15	0.96	0.88	0.99	0.98	1.01	0.53	0.73	0.78	1.37	1.03
Fe	μg/L	—	—	2.05	1.49	1.63	5.79	3.01	5.23	1.81	2.60	3.18	1.43	4.20	2.81
As	μg/L	50	50	1.219	0.659	0.699	0.739	0.912	1.026	1.034	0.764	0.929	1.060	1.077	1.086
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	11.8	13.6	17.3	10.0	8.1	13.6	23.7	24.9	18.8	21.2	19.5	14.5
Transparency	m	—	—		0.8			0.8			1.0			0.8	
Silicate	mg/L	—	—	0.24	0.14	0.13	0.12	0.09	0.27	0.17	0.20	0.09	0.07	0.14	0.07
Total oil	mg/L	—	—	2.3	2.6	2.5	2.1	2.1	1.8	1.9	2.0	2.2	2.5	2.1	1.8

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q1 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			1.0	11.5	23.0	1.0	3.0	6.0	1.0	3.0	6.0	1.0	10.5	21.0
Tepm.	℃	—	—	19.9	19.9	19.9	17.9	17.9	17.8	17.9	17.9	17.9	18.3	18.1	18.1
Salinity	PSU	—	—	34.3	34.3	34.3	33.6	33.6	33.6	33.6	33.6	33.5	33.7	33.7	33.7
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.9	7.0	6.9	7.0	7.0	6.8	6.3	6.4	6.3	6.5	6.4	6.6
B.O.D.	mg/L	≤ 2	≤ 2	1.2	1.3	1.1	1.4	1.4	1.3	0.9	0.7	0.5	0.8	0.6	0.8
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	15	20	50	15	15	<10	<10	<10
S.S.	mg/L	—	—	16.6	20.4	21.0	23.3	19.4	28.2	22.5	23.2	20.8	19.3	23.9	34.0
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	0.5	0.6	ND	0.7	0.8	ND	ND	ND	0.5	ND	ND	ND
Chlorophyll a	μg/L	—	—	0.6	0.4	0.6	1.2	1.2	1.0	0.4	0.9	1.2	1.0	0.6	0.9
Total phosphorus	mg/L	0.05	0.05	0.022	0.018	0.016	0.030	0.024	0.022	0.024	0.019	0.025	0.020	0.030	0.023
NH3-N	mg/L	0.3	0.3	0.04	0.01	0.02	0.11	0.16	0.11	0.15	0.09	0.13	0.13	0.09	0.06
Nitrite nitrogen	μg/L	—	—	7.94	9.46	16.06	13.52	16.22	16.73	19.10	29.58	15.89	15.38	14.53	22.82
Nitrate nitrogen	mg/L	—	—	0.09	0.09	0.09	0.03	0.02	0.03	0.12	0.11	0.11	0.08	0.07	0.08
Cd	μg/L	10	5	0.0273	0.0378	0.0317	0.0469	0.0231	0.0356	0.0288	0.0226	0.0366	0.0297	0.0302	0.0366
Cr	μg/L	—	—	0.28	0.72	0.93	0.13	0.95	0.54	0.39	0.19	0.28	0.57	0.19	0.30
Co	μg/L	—	—	0.029	0.085	0.050	0.052	0.037	0.055	0.065	0.023	0.043	0.052	0.032	0.096
Cu	μg/L	30	30	0.288	0.597	0.471	0.601	0.791	0.486	0.840	1.308	0.657	1.071	0.463	0.442
Ni	μg/L		100	0.415	0.906	1.236	0.286	0.721	0.745	0.493	0.167	0.167	0.479	0.250	0.681
Pb	μg/L	100	10	0.065	0.119	0.176	0.114	0.079	0.089	0.064	0.085	0.145	0.102	0.092	0.113
Zn	μg/L	500	500	2.82	2.53	2.17	1.13	2.26	1.58	0.66	1.98	1.97	2.47	1.87	1.87
Fe	μg/L	—	—	2.61	4.09	5.83	2.45	4.46	2.30	3.53	3.42	2.33	1.63	2.65	3.39
As	μg/L	50	50	1.535	1.410	1.765	0.613	0.867	0.821	0.992	0.949	0.972	1.159	1.231	0.747
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	6.5	7.3	8.6	19.7	15.6	17.7	11.7	12.5	8.5	12.5	14.7	17.3
Transparency	m	—	—		1.0			0.8			0.8			1.0	
Silicate	mg/L	—	—	0.14	0.24	0.14	0.18	0.23	0.12	0.14	0.18	0.25	0.12	0.22	0.52
Total oil	mg/L	—	—	2.1	3.0	1.8	2.3	2.2	2.9	2.2	1.9	2.7	2.2	2.2	2.9

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q1 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			1.0	8.0	16.0	1.0	9.5	19.0	1.0	1.0	1.0
Tepm.	℃	—	—	17.6	17.6	17.6	18.2	18.2	18.3	17.7	17.3	17.3
Salinity	PSU	—	—	33.4	33.4	33.5	33.7	33.7	33.7	33.5	33.3	33.4
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.1	8.1	8.1	8.0	8.0	8.1
D.O.	mg/L	≥ 5.0	≥5.0	7.1	6.8	6.8	6.4	6.6	7.2	6.7	7.0	6.8
B.O.D.	mg/L	≤ 2	≤ 2	1.2	0.8	1.2	0.6	0.8	1.3	1.1	1.6	1.1
E. coli	CFU/100ml	≤ 1000	≤ 1000	15	<10	10	20	<10	<10	55	180	70
S.S.	mg/L	—	—	30.8	31.1	50.1	36.8	40.0	46.3	36.8	53.0	33.8
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	2.38	ND
Mineral oil	mg/L	2	2	ND	ND	ND	0.5	ND	ND	ND	ND	ND
Chlorophyll a	μg/L	—	—	0.9	0.7	0.7	0.6	0.4	0.4	1.9	1.8	1.2
Total phosphorus	mg/L	0.05	0.05	0.018	0.036	0.033	0.032	0.018	0.027	0.023	0.033	0.029
NH3-N	mg/L	0.3	0.3	0.04	0.06	0.05	0.05	0.02	0.01	0.23	0.24	0.10
Nitrite nitrogen	μg/L	—	—	18.42	25.52	17.41	16.56	17.41	16.56	15.38	20.62	9.46
Nitrate nitrogen	mg/L	—	—	0.11	0.11	0.11	0.05	0.06	0.05	0.12	0.13	0.15
Cd	μg/L	10	5	0.0250	0.0202	0.0192	0.0262	0.0299	0.0251	0.0219	0.0313	0.0317
Cr	μg/L	—	—	0.78	0.22	0.46	0.28	0.57	0.60	0.22	0.26	0.60
Co	μg/L	—	—	0.085	0.015	0.017	0.047	0.061	0.033	0.039	0.096	0.064
Cu	μg/L	30	30	0.630	0.948	1.442	0.727	1.106	1.133	0.747	0.524	0.923
Ni	μg/L		100	1.135	0.359	0.392	0.446	0.917	0.951	0.114	0.740	0.573
Pb	μg/L	100	10	0.051	0.052	0.056	0.036	0.078	0.085	0.086	0.072	0.055
Zn	μg/L	500	500	1.21	0.68	0.52	2.02	3.56	2.94	3.07	3.40	1.63
Fe	μg/L	—	—	6.82	2.52	1.93	2.86	1.83	4.31	3.43	3.58	2.98
As	μg/L	50	50	1.333	1.333	1.393	1.140	0.935	0.795	1.029	0.861	2.075
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	15.1	17.7	27.2	22.3	19.4	27.5	28.9	29.9	18.6
Transparency	m	—	—	0.8			0.8			0.5	0.8	0.8
Silicate	mg/L	—	—	0.13	0.24	0.29	0.57	0.29	0.23	0.08	0.27	0.46
Total oil	mg/L	—	—	2.2	2.3	2.6	2.6	2.1	2.1	2.2	1.5	2.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q2 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			1.0	7.0	13.0	1.0	11.0	20.0	1.0	11.0	21.0	1.0	11.5	22.0
Tepm.	℃	—	—	25.5	24.7	24.7	25.5	24.6	24.6	25.3	24.8	24.8	25.3	25.0	25.0
Salinity	PSU	—	—	33.0	33.5	33.6	33.3	33.3	33.6	33.7	33.9	33.8	34.1	34.1	34.1
pH	-	7.5~8.5	7.5~8.5	8.3	8.2	8.2	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	7.1	6.9	6.7	7.2	7.0	7.0	7.1	7.0	6.8	6.8	6.7
B.O.D.	mg/L	≤ 2	≤ 2	1.1	0.7	0.3	0.9	1.0	0.4	0.6	0.3	0.6	0.3	0.3	0.2
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	10	35	60	<10	<10	<10	<10	20	15	20
S.S.	mg/L	—	—	15.9	10.7	11.2	15.1	8.7	8.9	12.1	6.2	11.3	6.7	10.6	7.1
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.6	0.8	0.9	ND	0.6	0.5	ND	0.5	ND	ND	ND
Chlorophyll a	μg/L	—	—	6.6	5.6	5.0	5.4	6.9	5.1	4.2	3.3	3.9	1.6	1.6	1.0
Total phosphorus	mg/L	0.05	0.05	0.021	0.025	0.021	0.013	0.021	0.022	0.024	0.021	0.030	0.027	0.026	0.029
NH3-N	mg/L	0.3	0.3	0.06	0.08	0.04	0.08	0.08	0.12	0.07	0.09	0.10	0.05	0.12	0.08
Nitrite nitrogen	μg/L	—	—	4.18	5.18	8.53	3.18	3.85	8.19	4.85	6.35	6.35	5.68	4.35	6.86
Nitrate nitrogen	mg/L	—	—	0.03	0.07	0.06	0.03	0.04	0.06	0.06	0.04	0.04	0.06	0.05	0.05
Cd	μg/L	10	5	0.0336	0.0087	0.0151	0.0127	0.0072	0.0185	0.0203	0.0115	0.0100	0.0036	0.0064	0.0114
Cr	μg/L	—	—	0.30	0.41	0.51	0.62	0.26	0.40	0.31	0.26	0.41	0.25	0.19	0.55
Co	μg/L	—	—	0.049	0.039	0.051	0.047	0.040	0.046	0.040	0.038	0.044	0.030	0.027	0.031
Cu	μg/L	30	30	0.800	0.878	0.586	0.854	0.619	0.668	0.833	0.672	0.731	0.484	1.132	0.519
Ni	μg/L		100	0.426	0.297	0.404	0.355	0.350	0.433	0.386	0.308	0.408	0.255	0.321	0.290
Pb	μg/L	100	10	0.098	0.097	0.093	0.103	0.084	0.157	0.094	0.092	0.100	0.082	0.084	0.084
Zn	μg/L	500	500	1.98	1.42	2.24	1.44	1.23	2.47	1.49	1.52	1.34	1.13	1.06	1.29
Fe	μg/L	—	—	3.71	2.31	2.52	2.89	2.76	2.58	2.62	2.57	3.16	1.66	4.66	2.81
As	μg/L	50	50	1.140	0.833	0.709	0.918	0.889	1.053	1.045	0.845	0.816	0.821	0.878	0.825
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	3.7	4.7	5.2	6.2	5.0	5.0	3.2	3.6	3.8	1.0	1.9	2.6
Transparency	m	—	—		1.0			1.0			1.0			2.5	
Silicate	mg/L	—	—	0.30	0.23	0.38	0.07	0.04	0.05	0.07	0.11	0.15	0.08	0.24	0.16
Total oil	mg/L	—	—	1.9	2.1	2.6	2.8	2.6	1.7	1.6	2.2	2.4	2.7	1.7	2.4

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q2 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			1.0	11.5	22.0	1.0	3.0	5.0	1.0	3.0	6.0	1.0	11.0	21.0
Tepm.	℃	—	—	25.6	25.3	25.2	24.9	24.8	24.8	25.2	24.7	24.8	26.0	24.5	24.5
Salinity	PSU	—	—	34.2	34.2	34.2	32.4	33.0	33.4	32.2	33.5	33.5	33.7	33.7	33.8
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.3	8.2	8.2	8.3	8.2	8.2	8.1	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.2	6.7	6.3	7.3	7.3	7.1	7.1	6.8	6.7	7.4	7.1	6.8
B.O.D.	mg/L	≤ 2	≤ 2	0.5	0.4	0.5	1.1	1.3	0.5	1.5	0.6	0.3	1.2	0.4	0.3
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	35	20	35	60	35	30	10	<10	20
S.S.	mg/L	—	—	8.2	5.7	6.0	22.0	17.1	16.8	9.2	12.5	8.9	11.7	9.8	8.5
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.03	ND
Mineral oil	mg/L	2	2	0.5	ND	ND	ND	0.8	ND	ND	ND	0.6	0.5	0.7	0.5
Chlorophyll a	μg/L	—	—	1.0	0.7	1.0	7.0	7.6	5.0	7.8	4.5	4.6	8.0	5.5	3.2
Total phosphorus	mg/L	0.05	0.05	0.030	0.027	0.024	0.027	0.023	0.021	0.021	0.024	0.023	0.021	0.025	0.027
NH3-N	mg/L	0.3	0.3	0.05	0.09	0.11	0.09	0.08	0.09	0.09	0.07	0.03	0.08	0.10	0.12
Nitrite nitrogen	μg/L	—	—	3.01	2.34	3.85	4.85	9.86	12.37	5.35	6.35	5.85	7.19	10.70	12.37
Nitrate nitrogen	mg/L	—	—	0.05	0.04	0.04	0.05	0.09	0.08	0.05	0.04	0.04	0.05	0.05	0.06
Cd	μg/L	10	5	0.0125	0.0145	0.0127	0.0202	0.0073	0.0165	0.0065	0.0089	0.0330	0.0142	0.0228	0.0197
Cr	μg/L	—	—	0.38	0.22	0.25	0.37	0.67	0.59	0.27	0.35	0.26	0.30	0.39	0.24
Co	μg/L	—	—	0.054	0.035	0.044	0.067	0.056	0.053	0.049	0.047	0.051	0.076	0.074	0.055
Cu	μg/L	30	30	0.602	0.821	0.336	0.684	1.081	0.662	1.447	1.182	0.805	0.724	1.236	1.287
Ni	μg/L		100	0.430	0.342	0.240	0.503	0.414	0.457	0.714	0.516	0.650	0.530	0.699	0.327
Pb	μg/L	100	10	0.087	0.084	0.082	0.111	0.096	0.040	0.107	0.083	0.092	0.109	0.067	0.133
Zn	μg/L	500	500	1.53	1.56	0.64	1.93	1.67	1.23	3.80	1.38	3.89	3.04	1.84	1.37
Fe	μg/L	—	—	2.76	2.64	3.88	3.99	4.14	3.92	3.04	2.82	4.60	4.34	3.76	2.79
As	μg/L	50	50	1.235	1.174	1.239	0.752	1.138	0.794	1.022	0.833	0.878	0.892	0.817	0.742
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	1.6	1.4	3.4	9.8	8.3	5.6	2.5	2.0	3.2	2.5	2.0	2.6
Transparency	m	—	—		2.5			0.5			0.8			1.0	
Silicate	mg/L	—	—	0.07	0.15	0.07	0.12	0.10	0.05	0.08	0.07	0.10	0.17	0.07	0.28
Total oil	mg/L	—	—	2.3	1.4	1.3	2.3	1.6	2.2	2.3	2.5	2.0	1.8	1.5	2.8

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q2 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	1.0	1.0
Tepm.	℃	—	—	25.4	24.8	24.2	25.5	24.9	24.3	26.1	25.8	24.0
Salinity	PSU	—	—	34.2	34.2	34.2	34.2	34.2	34.2	30.3	33.3	33.6
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.4	8.3	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.4	6.8	6.6	6.5	6.2	6.6	7.9	7.6	6.9
B.O.D.	mg/L	≤ 2	≤ 2	0.4	0.3	0.2	0.7	0.7	0.4	1.8	1.6	0.7
E. coli	CFU/100ml	≤ 1000	≤ 1000	20	35	15	30	30	40	75	90	125
S.S.	mg/L	—	—	11.6	7.6	10.6	6.2	8.9	8.3	28.7	15.2	12.3
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	1.25	ND
Mineral oil	mg/L	2	2	0.6	ND	ND	ND	0.5	ND	ND	ND	ND
Chlorophyll a	μg/L	—	—	0.7	0.4	0.6	1.2	0.6	2.5	14.9	8.6	2.7
Total phosphorus	mg/L	0.05	0.05	0.032	0.030	0.022	0.030	0.027	0.032	0.031	0.027	0.035
NH3-N	mg/L	0.3	0.3	0.07	0.04	0.03	0.07	0.06	0.08	0.11	0.15	0.13
Nitrite nitrogen	μg/L	—	—	6.02	2.34	2.34	2.34	1.17	3.18	9.70	17.56	23.07
Nitrate nitrogen	mg/L	—	—	0.08	0.05	0.04	0.06	0.05	0.04	0.06	0.13	0.25
Cd	μg/L	10	5	0.0028	0.0107	0.0057	0.0206	0.0032	0.0124	0.0208	0.0271	0.0137
Cr	μg/L	—	—	0.27	0.37	0.33	0.24	0.27	0.13	0.51	0.42	0.28
Co	μg/L	—	—	0.029	0.041	0.034	0.037	0.033	0.026	0.085	0.066	0.031
Cu	μg/L	30	30	1.091	1.388	0.946	0.925	0.927	0.851	1.487	1.106	0.878
Ni	μg/L		100	0.425	0.371	0.200	0.467	0.423	0.257	0.767	0.478	0.305
Pb	μg/L	100	10	0.071	0.062	0.071	0.140	0.093	0.073	0.108	0.088	0.069
Zn	μg/L	500	500	0.90	0.72	0.73	1.69	1.41	0.95	6.09	1.95	0.84
Fe	μg/L	—	—	2.04	2.79	1.70	2.72	2.97	2.18	3.80	3.48	2.45
As	μg/L	50	50	0.942	1.053	0.927	0.957	0.797	0.744	0.950	0.724	1.622
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	2.0	1.8	1.9	1.5	1.9	2.3	9.7	7.3	2.8
Transparency	m	—	—		3.0			3.0		0.5	1.0	1.8
Silicate	mg/L	—	—	0.36	0.15	0.09	0.11	0.18	0.07	0.07	0.03	0.11
Total oil	mg/L	—	—	2.4	1.4	1.4	1.4	1.6	1.5	2.7	1.9	2.3

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q3 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			1.0	7.5	14.0	1.0	8.0	16.0	1.0	11.5	22.0	1.0	11.0	22.0
Tepm.	℃	—	—	30.4	30.4	30.3	30.4	30.3	30.3	30.2	30.2	30.2	30.4	30.4	30.4
Salinity	PSU	—	—	32.9	32.9	32.9	33.0	33.0	33.0	33.0	33.0	33.0	33.1	33.0	33.0
pH	-	7.5~8.5	7.5~8.5	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.8	7.0	6.9	6.5	6.6	6.5	6.6	6.5	6.6	6.5	6.8	6.4
B.O.D.	mg/L	≤ 2	≤ 2	1.0	0.9	0.8	1.1	0.9	0.8	0.8	1.0	0.9	1.0	1.1	0.7
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	13.8	14.8	18.1	14.9	7.8	15.5	13.2	13.8	14.5	16.8	16.5	12.4
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	1.26	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	0.9	0.6	0.9	0.7	0.8	1.3	1.0	0.5	ND	ND	1.0	0.9
Chlorophyll a	μg/L	—	—	3.4	4.4	3.6	2.5	2.5	2.5	2.1	3.3	2.5	2.4	3.4	2.7
Total phosphorus	mg/L	0.05	0.05	0.029	0.013	0.023	0.034	0.025	0.030	0.021	0.034	0.032	0.032	0.029	0.031
NH3-N	mg/L	0.3	0.3	0.08	0.13	0.13	0.08	0.10	0.05	0.12	0.06	0.07	0.13	0.11	0.05
Nitrite nitrogen	μg/L	—	—	6.08	6.79	6.26	9.48	5.54	5.36	3.22	3.93	3.40	1.97	1.25	1.43
Nitrate nitrogen	mg/L	—	—	0.05	0.07	0.04	0.05	0.04	0.05	0.04	0.04	0.03	0.05	0.05	0.04
Cd	μg/L	10	5	0.0736	0.0704	0.0133	0.0123	0.0171	0.0237	0.0100	0.0215	0.0290	0.0215	0.0411	0.0299
Cr	μg/L	—	—	0.42	0.27	0.19	0.67	0.54	0.83	0.17	0.29	0.21	0.41	0.75	0.50
Co	μg/L	—	—	0.039	0.031	0.016	0.053	0.033	0.058	0.021	0.042	0.022	0.035	0.026	0.033
Cu	μg/L	30	30	0.659	0.643	1.139	1.100	1.192	0.697	1.006	0.603	0.998	0.318	0.549	0.433
Ni	μg/L		100	0.633	0.399	0.234	0.736	1.058	0.939	0.275	0.519	0.620	0.395	0.443	0.566
Pb	μg/L	100	10	0.049	0.028	0.065	0.222	0.112	0.101	0.103	0.126	0.054	0.159	0.182	0.140
Zn	μg/L	500	500	1.95	1.23	0.58	1.77	1.44	2.23	0.96	2.95	1.78	1.53	2.12	0.71
Fe	μg/L	—	—	2.55	1.46	2.11	4.23	4.30	5.08	1.68	4.44	3.92	2.73	2.72	3.55
As	μg/L	50	50	1.036	0.772	0.485	0.706	0.946	0.863	1.041	0.658	0.721	0.813	0.921	0.637
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	4.4	5.3	8.2	6.3	3.0	3.1	2.1	3.3	6.2	4.1	5.1	3.7
Transparency	m	—	—		1.7			1.7			2.3			2.0	
Silicate	mg/L	—	—	0.04	0.07	0.05	0.05	0.04	0.09	0.06	0.09	0.08	0.08	0.12	0.10
Total oil	mg/L	—	—	2.5	3.0	2.3	3.0	2.6	2.0	2.4	2.1	2.3	2.6	2.1	1.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q3 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			1.0	11.0	21.0	1.0	3.0	6.0	1.0	4.0	7.0	1.0	11.5	22.0
Tepm.	℃	—	—	30.3	30.2	30.2	30.4	30.4	30.5	30.4	30.4	30.5	30.4	30.4	30.4
Salinity	PSU	—	—	33.0	33.0	33.0	32.9	32.9	32.9	32.8	32.8	32.8	33.0	33.0	33.0
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.3	8.3	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.8	7.1	7.0	6.7	7.0	6.8	6.7	6.8	6.8	6.6	6.6	6.5
B.O.D.	mg/L	≤ 2	≤ 2	0.8	1.1	1.1	1.2	0.9	0.8	1.1	0.9	1.0	1.1	0.8	0.7
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	10	20	<10	<10	<10	<10	<10	<10
S.S.	mg/L	—	—	11.1	9.4	13.3	19.3	20.9	27.5	15.5	22.2	17.9	7.8	12.8	12.9
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	1.07	ND	ND	ND	1.07
Mineral oil	mg/L	2	2	ND	ND	ND	ND	0.9	ND	0.5	ND	1.7	0.6	ND	1.5
Chlorophyll a	μg/L	—	—	3.6	3.0	2.8	4.7	5.5	4.0	4.9	5.0	4.7	2.7	2.8	3.4
Total phosphorus	mg/L	0.05	0.05	0.027	0.024	0.029	0.012	0.027	0.026	0.030	0.013	0.017	0.026	0.028	0.032
NH3-N	mg/L	0.3	0.3	0.13	0.07	0.08	0.13	0.06	0.07	0.09	0.08	0.06	0.08	0.09	0.11
Nitrite nitrogen	μg/L	—	—	2.86	1.79	1.97	5.72	4.83	4.29	3.75	6.97	7.15	6.62	3.58	6.97
Nitrate nitrogen	mg/L	—	—	0.03	0.04	0.06	0.06	0.06	0.04	0.07	0.11	0.09	0.06	0.05	0.04
Cd	μg/L	10	5	0.0172	0.0311	0.0390	0.0516	0.0124	0.0384	0.0189	0.0114	0.0285	0.0194	0.0239	0.0189
Cr	μg/L	—	—	0.33	0.40	0.60	0.26	0.58	0.49	0.39	0.13	0.33	0.33	0.27	0.26
Co	μg/L	—	—	0.029	0.048	0.052	0.043	0.035	0.055	0.050	0.023	0.055	0.040	0.040	0.049
Cu	μg/L	30	30	0.582	0.652	0.389	0.438	1.071	0.895	0.859	0.614	0.348	1.062	0.910	0.435
Ni	μg/L		100	0.262	0.559	1.062	0.289	0.709	0.749	0.417	0.260	0.436	0.774	0.744	0.364
Pb	μg/L	100	10	0.100	0.116	0.135	0.088	0.063	0.128	0.109	0.068	0.094	0.049	0.069	0.064
Zn	μg/L	500	500	1.34	2.83	2.50	2.68	1.36	2.90	1.46	0.84	1.66	3.78	3.26	1.86
Fe	μg/L	—	—	2.76	3.11	5.44	3.49	3.13	2.95	2.73	1.23	0.93	2.37	3.88	2.13
As	μg/L	50	50	1.174	1.592	1.203	0.743	1.073	0.808	0.989	0.906	0.818	0.671	0.606	0.617
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	5.2	2.5	4.6	8.4	5.9	13.0	7.6	7.7	7.1	4.2	3.4	5.6
Transparency	m	—	—		2.2			1.4			1.4			2.5	
Silicate	mg/L	—	—	0.06	0.09	0.11	0.07	0.10	0.05	0.08	0.18	0.14	0.18	0.09	0.14
Total oil	mg/L	—	—	2.0	3.1	2.5	1.9	2.1	2.3	3.1	2.8	3.3	1.8	2.3	2.3

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q3 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			1.0	9.0	17.0	1.0	10.5	20.5	1.0	1.0	1.0
Tepm.	℃	—	—	30.1	30.1	30.1	30.0	30.0	30.0	30.6	30.4	30.6
Salinity	PSU	—	—	32.9	32.9	32.9	33.0	33.0	33.0	32.9	32.8	32.6
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	7.3	6.5	6.6	6.6	6.7	7.1	7.4	7.5	7.2
B.O.D.	mg/L	≤ 2	≤ 2	1.2	0.9	1.1	0.8	0.8	1.0	1.4	1.5	1.3
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	10	<10
S.S.	mg/L	—	—	21.3	19.0	22.1	16.2	11.5	12.6	28.6	30.8	29.7
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	1.17	ND	ND	1.17	ND	ND
Mineral oil	mg/L	2	2	0.7	ND	0.9	0.6	ND	ND	1.5	ND	ND
Chlorophyll a	μg/L	—	—	7.6	2.4	3.7	2.2	2.4	4.4	7.6	9.3	4.4
Total phosphorus	mg/L	0.05	0.05	0.023	0.019	0.035	0.036	0.024	0.020	0.016	0.011	0.019
NH3-N	mg/L	0.3	0.3	0.13	0.09	0.07	0.12	0.11	0.08	0.10	0.08	0.25
Nitrite nitrogen	μg/L	—	—	8.22	4.83	2.68	5.72	2.86	4.11	15.73	20.03	10.01
Nitrate nitrogen	mg/L	—	—	0.13	0.05	0.03	0.06	0.06	0.07	0.13	0.16	0.12
Cd	μg/L	10	5	0.0164	0.0110	0.0084	0.0175	0.0164	0.0146	0.0124	0.0228	0.0239
Cr	μg/L	—	—	0.46	0.10	0.31	0.24	0.33	0.30	0.21	0.27	0.45
Co	μg/L	—	—	0.055	0.023	0.028	0.050	0.039	0.031	0.042	0.059	0.047
Cu	μg/L	30	30	0.485	1.044	1.136	0.943	0.527	0.832	1.055	0.469	0.574
Ni	μg/L		100	0.912	0.213	0.479	0.639	0.418	0.586	0.292	0.489	1.304
Pb	μg/L	100	10	0.085	0.060	0.075	0.032	0.085	0.085	0.117	0.113	0.112
Zn	μg/L	500	500	1.15	0.69	0.55	3.51	2.83	1.52	2.53	3.24	3.52
Fe	μg/L	—	—	4.29	2.17	2.86	2.97	1.66	3.17	2.10	1.60	2.41
As	μg/L	50	50	0.979	0.992	0.847	0.819	0.798	0.648	1.072	0.657	1.608
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	9.2	8.6	10.9	7.8	7.8	5.6	15.9	17.2	21.1
Transparency	m	—	—		1.5			1.5		0.8	0.8	0.8
Silicate	mg/L	—	—	0.16	0.18	0.08	0.05	0.10	0.08	0.25	0.33	0.33
Total oil	mg/L	—	—	1.6	1.7	3.4	2.2	2.7	3.6	2.6	2.0	2.1

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q4 monitoring results of marine water quality near Mailiao (1/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	1A	1A	1A	2A	2A	2A	3A	3A	3A	4A	4A	4A
Depth	meter			1.0	7.0	13.0	1.0	10.0	19.0	1.0	11.5	22.0	1.0	12.0	23.0
Tepm.	℃	—	—	29.3	28.9	28.9	30.8	28.8	28.8	28.9	28.9	28.9	29.2	29.1	29.1
Salinity	PSU	—	—	33.7	33.7	33.7	33.6	33.8	33.7	33.8	33.7	33.7	33.8	33.8	33.8
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.0	8.2	8.1	8.2	8.2	8.2	8.2	8.2	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	6.5	6.8	6.9	6.7	6.9	6.7	6.8	6.4	6.9	6.6	6.7
B.O.D.	mg/L	≤ 2	≤ 2	0.6	0.7	0.8	0.5	0.4	0.8	0.6	0.5	0.6	0.5	0.9	0.5
E. coli	CFU/100ml	≤ 1000	≤ 1000	20	15	<10	35	10	20	<10	35	25	20	<10	<10
S.S.	mg/L	—	—	14.9	13.6	11.9	9.3	9.3	9.9	5.6	9.1	9.2	8.1	11.9	10.8
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.6	ND	ND	ND	ND	ND	ND	0.5	0.7	0.7	0.8
Chlorophyll a	μg/L	—	—	4.4	2.7	2.8	4.0	3.0	3.3	0.9	1.0	0.9	0.6	0.9	0.6
Total phosphorus	mg/L	0.05	0.05	0.023	0.025	0.023	0.023	0.014	0.018	0.036	0.028	0.029	0.026	0.021	0.020
NH3-N	mg/L	0.3	0.3	0.05	0.11	0.05	0.05	0.10	0.07	0.10	0.05	0.05	0.04	0.08	0.05
Nitrite nitrogen	μg/L	—	—	15.35	12.70	13.05	18.70	13.41	20.82	9.35	10.05	14.99	21.87	27.34	19.40
Nitrate nitrogen	mg/L	—	—	0.08	0.11	0.11	0.08	0.09	0.11	0.14	0.11	0.11	0.24	0.35	0.29
Cd	μg/L	10	5	0.0521	0.0562	0.0523	0.0106	0.0114	0.0259	0.0117	0.0155	0.0551	0.0093	0.0130	0.0103
Cr	μg/L	—	—	0.33	0.86	0.14	0.29	0.26	0.28	0.37	0.36	0.40	0.22	0.44	0.49
Co	μg/L	—	—	0.060	0.042	0.032	0.058	0.034	0.050	0.030	0.031	0.028	0.023	0.042	0.046
Cu	μg/L	30	30	1.641	1.690	0.860	0.615	1.277	0.497	0.671	0.281	0.494	0.255	0.583	1.277
Ni	μg/L		100	0.454	0.245	0.422	0.225	0.189	0.258	0.305	0.143	0.123	0.121	0.316	0.364
Pb	μg/L	100	10	0.090	0.098	0.103	0.057	0.057	0.077	0.057	0.064	0.092	0.057	0.065	0.060
Zn	μg/L	500	500	1.04	1.25	0.50	1.12	0.97	1.58	0.79	0.65	0.60	0.80	1.75	2.20
Fe	μg/L	—	—	3.33	2.09	2.72	0.84	3.60	2.50	1.62	2.66	2.21	1.22	2.24	1.84
As	μg/L	50	50	0.937	1.042	0.744	0.935	0.758	1.002	0.619	0.971	0.844	0.824	0.575	0.887
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	2.9	4.3	4.6	2.6	4.0	7.5	3.6	4.9	3.8	3.0	5.2	2.8
Transparency	m	—	—		2.2			2.0			3.0			3.0	
Silicate	mg/L	—	—	0.20	0.31	0.29	0.19	0.15	0.20	0.18	0.17	0.10	0.10	0.16	0.11
Total oil	mg/L	—	—	1.6	1.6	1.9	3.0	1.8	3.0	1.5	1.5	1.4	4.4	2.9	2.9

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q4 monitoring results of marine water quality near Mailiao (2/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	5A	5A	5A	1B	1B	1B	2B	2B	2B	3B	3B	3B
Depth	meter			1.0	11.5	23.0	1.0	2.0	3.5	1.0	2.5	4.5	1.0	11.0	21.0
Tepm.	℃	—	—	29.2	29.1	29.1	29.4	29.1	29.1	29.2	29.0	29.0	29.1	28.9	28.9
Salinity	PSU	—	—	33.8	33.8	33.8	33.3	33.3	33.4	33.2	33.2	33.4	33.6	33.6	33.6
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.2	8.1	8.1	8.1	8.2
D.O.	mg/L	≥ 5.0	≥5.0	6.9	6.6	6.8	6.9	6.7	6.6	7.3	7.2	7.2	6.8	6.8	6.8
B.O.D.	mg/L	≤ 2	≤ 2	0.4	0.4	0.4	0.9	0.6	0.6	0.5	0.6	0.4	0.4	1.0	0.6
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	30	<10	20	35	20	<10	45	15	30	15	<10
S.S.	mg/L	—	—	6.9	5.8	5.2	12.4	14.2	11.1	15.2	13.9	11.7	9.7	9.6	9.6
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	2.09	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	ND	ND	ND	0.8	ND	0.5	0.9	ND	ND	ND	0.8
Chlorophyll a	μg/L	—	—	0.4	0.6	0.7	3.3	3.0	3.3	7.7	7.1	6.4	1.9	1.5	1.3
Total phosphorus	mg/L	0.05	0.05	0.038	0.030	0.040	0.021	0.014	0.013	0.029	0.032	0.036	0.020	0.025	0.020
NH3-N	mg/L	0.3	0.3	0.08	0.07	0.05	0.08	0.10	0.03	0.06	0.06	0.06	0.05	0.05	0.03
Nitrite nitrogen	μg/L	—	—	9.88	10.23	14.82	11.64	13.23	13.58	13.23	17.64	15.17	19.23	14.46	13.94
Nitrate nitrogen	mg/L	—	—	0.09	0.09	0.09	0.10	0.14	0.13	0.10	0.09	0.09	0.13	0.13	0.14
Cd	μg/L	10	5	0.0092	0.0076	0.0112	0.0487	0.0481	0.0564	0.0103	0.0182	0.0114	0.0573	0.0554	0.0261
Cr	μg/L	—	—	0.56	0.27	0.39	0.50	0.72	0.33	0.53	0.37	0.29	0.50	0.27	0.59
Co	μg/L	—	—	0.028	0.022	0.072	0.035	0.037	0.046	0.034	0.054	0.030	0.021	0.023	0.039
Cu	μg/L	30	30	0.629	0.229	0.437	0.792	1.162	0.980	0.716	1.404	0.448	0.221	0.338	0.900
Ni	μg/L		100	0.238	0.182	0.332	0.202	0.367	0.258	0.191	0.267	0.173	0.104	0.122	0.288
Pb	μg/L	100	10	0.059	0.057	0.063	0.087	0.089	0.092	0.057	0.059	0.061	0.098	0.096	0.077
Zn	μg/L	500	500	1.59	0.80	1.57	0.95	0.95	1.59	0.73	1.94	1.01	0.54	0.53	1.20
Fe	μg/L	—	—	0.86	0.75	3.35	3.04	1.64	0.75	6.45	2.22	2.72	1.73	0.63	4.65
As	μg/L	50	50	0.618	0.748	0.560	0.686	0.665	0.760	0.816	0.779	0.840	0.790	0.880	0.938
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	2.3	4.5	2.7	3.1	4.2	5.0	6.3	8.5	5.1	2.9	2.9	4.4
Transparency	m	—	—		3.0			2.0			1.5			3.0	
Silicate	mg/L	—	—	0.12	0.16	0.17	0.25	0.21	0.14	0.14	0.16	0.17	0.15	0.20	0.20
Total oil	mg/L	—	—	3.2	2.9	3.3	2.4	1.7	1.3	2.0	1.7	1.5	1.3	1.3	1.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q4 monitoring results of marine water quality near Mailiao (3/3)

Station	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	4B	4B	4B	5B	5B	5B	2C	3C	4M
Depth	meter			1.0	8.0	16.0	1.0	10.0	19.0	1.0	1.0	1.0
Tepm.	℃	—	—	29.1	28.9	28.9	29.1	28.9	29.0	29.4	29.5	29.0
Salinity	PSU	—	—	33.6	33.6	33.6	33.6	33.6	33.6	33.1	33.6	33.2
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.0	8.1	8.1	8.2	8.1	8.1
D.O.	mg/L	≥ 5.0	≥5.0	6.9	6.8	6.7	6.6	6.2	6.8	7.2	7.3	6.7
B.O.D.	mg/L	≤ 2	≤ 2	0.5	0.6	0.4	0.4	0.5	0.5	0.5	0.4	0.5
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	30	<10	<10	10	<10	30	70
S.S.	mg/L	—	—	8.2	14.6	6.1	10.1	8.2	13.5	25.5	19.8	18.5
Cyanide	μg/L	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total phenols	μg/L	10	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mineral oil	mg/L	2	2	ND	0.5	ND	ND	ND	0.9	ND	0.7	ND
Chlorophyll a	μg/L	—	—	1.3	0.9	1.0	0.7	0.9	0.9	9.0	6.8	1.9
Total phosphorus	mg/L	0.05	0.05	0.039	0.033	0.030	0.019	0.019	0.020	0.038	0.037	0.044
NH3-N	mg/L	0.3	0.3	0.08	0.12	0.07	0.11	0.10	0.10	0.04	0.06	0.17
Nitrite nitrogen	μg/L	—	—	18.52	16.41	14.64	16.23	14.99	26.11	16.76	21.52	21.87
Nitrate nitrogen	mg/L	—	—	0.14	0.11	0.13	0.11	0.09	0.09	0.14	0.09	0.10
Cd	μg/L	10	5	0.0105	0.0098	0.0082	0.0091	0.0094	0.0126	0.0115	0.0130	0.0091
Cr	μg/L	—	—	0.35	0.24	0.36	0.39	0.18	0.20	0.96	0.83	0.39
Co	μg/L	—	—	0.054	0.040	0.026	0.035	0.037	0.031	0.055	0.044	0.046
Cu	μg/L	30	30	0.303	1.078	0.229	0.834	0.512	1.132	0.341	0.210	0.500
Ni	μg/L		100	0.929	0.483	0.138	0.241	0.189	0.259	0.302	0.292	0.380
Pb	μg/L	100	10	0.065	0.069	0.057	0.060	0.059	0.059	0.053	0.060	0.058
Zn	μg/L	500	500	1.63	1.54	0.84	0.71	1.47	1.89	0.89	1.10	0.95
Fe	μg/L	—	—	3.13	3.64	1.48	1.07	0.78	2.91	3.24	1.83	4.00
As	μg/L	50	50	0.778	0.450	0.714	1.138	0.722	1.026	0.929	0.981	0.847
Hg	μg/L	2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidty	NTU	—	—	5.0	4.1	3.1	2.1	2.7	3.0	14.0	7.3	6.4
Transparency	m	—	—		2.0			2.3		0.5	0.7	0.7
Silicate	mg/L	—	—	0.17	0.18	0.42	0.23	0.20	0.30	0.18	0.13	0.12
Total oil	mg/L	—	—	2.4	2.7	2.8	4.7	2.4	1.9	1.5	1.7	2.5

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

Appendix 2 - monitoring results of harbor area water quality

◢2021 Q1 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	17.4	17.8	17.7	17.4	17.4	17.5	17.6	17.6	17.6
pH	-	7.5~8.5	7.5~8.5	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Salinity	PSU	—	—	32.9	33.2	32.9	33.0	33.0	32.9	33.2	33.0	32.9
S.S.	mg/L	—	—	3.7	3.2	7.8	7.8	7.0	6.0	8.3	4.5	8.5
C.O.D.	mg/L	—	—	6.0	6.2	5.7	5.6	6.1	5.8	5.5	6.2	6.1
B.O.D.	mg/L	≤ 2	≤ 2	1.7	1.6	1.9	1.8	1.7	1.6	1.9	1.8	1.6
D.O.	mg/L	≥ 5.0	≥5.0	5.5	5.3	5.3	5.5	5.3	5.3	5.5	5.3	5.3
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.24	0.22	0.23	0.21	0.18	0.19	0.19	0.21	0.23
Nitrite-N	mg/L	—	—	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
NH3-N	mg/L	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total phosphorus	mg/L	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03
T.O.C.	mg/L	—	—	–	<1.0	1.1	3.2	<1.0	<1.0	<1.0	<1.0	<1.0
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	1	1	1	1	1	1	1	1	1
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	15	<10	1.7×10²	30	20	<10	<10	25	<10
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.099	0.099	0.032	0.038	0.033	0.035	0.099	0.028	0.020
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<0.0050
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	<0.0010	0.00	N.D.	N.D.	N.D.	N.D.	0.00	<0.0010	N.D.
Cu	mg/L	0.03	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	<0.0010
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q2 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	23.2	23.2	23.3	22.7	22.6	22.6	23.3	23.3	23.2
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.1	8.1	8.1	8.2	8.2	8.2
Salinity	PSU	—	—	33.4	33.2	33.2	32.8	32.9	32.8	32.9	32.9	32.8
S.S.	mg/L	—	—	13.4	6.8	12.2	4.9	5.9	4.8	13.6	7.4	5.6
C.O.D.	mg/L	—	—	5.9	5.9	5.6	5.8	6.2	6.0	5.5	5.8	5.8
B.O.D.	mg/L	≤ 2	≤ 2	1.7	1.8	1.7	1.7	1.6	1.6	1.8	1.9	1.6
D.O.	mg/L	≥ 5.0	≥5.0	5.5	5.4	5.4	5.7	5.7	5.7	5.6	5.6	5.6
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.24	0.22	0.23	0.24	0.22	0.21	0.25	0.23	0.23
Nitrite-N	mg/L	—	—	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03
NH3-N	mg/L	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total phosphorus	mg/L	0.05	0.05	0.01	0.01	0.01	N.D.	0.01	0.01	0.01	0.01	0.01
T.O.C.	mg/L	—	—	–	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	<1.0
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	4	2	1	3	3	3	4	3	3
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	85	10	60	45	90	75	60	1.1×10^2	1.0×10^2
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.005	0.004	0.004	0.004	0.006	0.004	0.004	0.004	0.004
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	<0.0010	<0.0010	<0.0010	N.D.	<0.0010	N.D.	N.D.	<0.0010	0.00
Cu	mg/L	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q3 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	31.8	31.6	31.5	31.5	31.7	31.6	31.2	31.3	31.1
pH	-	7.5~8.5	7.5~8.5	8.0	8.0	8.0	7.9	7.9	7.9	8.1	8.1	8.1
Salinity	PSU	—	—	33.1	33.2	33.1	33.0	33.1	32.9	32.8	32.8	32.6
S.S.	mg/L	—	—	3.1	6.2	3.9	3.1	3.0	4.0	3.1	5.0	3.8
C.O.D.	mg/L	—	—	11.7	11.0	9.0	13.9	10.4	10.1	8.4	9.3	12.9
B.O.D.	mg/L	≤ 2	≤ 2	1.8	1.7	1.8	1.8	1.6	1.7	1.7	1.9	1.6
D.O.	mg/L	≥ 5.0	≥5.0	5.5	5.5	5.5	5.6	5.6	5.6	5.6	5.7	5.7
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.26	0.28	0.28	0.28	0.27	0.29	0.28	0.28	0.28
Nitrite-N	mg/L	—	—	N.D.	<0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	<0.01
NH3-N	mg/L	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N.D.	0.0
Total phosphorus	mg/L	0.05	0.05	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.03
T.O.C.	mg/L	—	—	–	1.2	1.6	1.5	1.5	1.5	1.5	1.3	1.6
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	1	1	1	1	1	1	2	1	1
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	<10
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.006
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	N.D.	<0.0010	<0.0010	N.D.	<0.0010	N.D.	N.D.	N.D.	<0.0010
Cu	mg/L	0.03	0.03	<0.0010	0.00	0.00	<0.0010	<0.0010	<0.0010	<0.0010	0.00	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2021 Q4 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	25.8	25.8	25.7	25.2	25.2	25.1	25.6	25.8	25.6
pH	-	7.5~8.5	7.5~8.5	8.0	7.9	8.0	7.8	7.8	7.8	7.9	7.9	7.9
Salinity	PSU	—	—	31.3	31.4	31.2	32.1	32.3	32.0	30.8	30.9	31.0
S.S.	mg/L	—	—	13.4	14.3	14.2	13.8	14.7	14.2	13.9	14.5	13.7
C.O.D.	mg/L	—	—	3.9	4.3	5.1	4.0	3.6	N.D.	1.6	2.7	3.2
B.O.D.	mg/L	≤ 2	≤ 2	1.6	1.9	1.7	1.8	1.7	1.7	1.9	1.8	1.7
D.O.	mg/L	≥ 5.0	≥5.0	5.7	5.7	5.7	5.9	5.8	5.7	5.8	5.8	5.9
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.23	0.22	0.23	0.26	0.25	0.27	0.26	0.23	0.23
Nitrite-N	mg/L	—	—	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04
NH3-N	mg/L	0.3	0.3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total phosphorus	mg/L	0.05	0.05	0.02	0.02	0.01	0.02	0.03	0.02	0.03	0.01	0.02
T.O.C.	mg/L	—	—	–	1.2	<1.0	3.5	<1.0	<1.0	<1.0	<1.0	<1.0
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	0	0	0	0	1	2	0	0	0
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	<10	<10	<10	<10	<10	<10
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.075	0.077	0.076	0.070	0.071	0.070	0.073	0.073	0.078
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	N.D.	N.D.	0.00	N.D.	N.D.	<0.0010	N.D.	<0.0010	N.D.
Cu	mg/L	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q1 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	23.1	22.9	22.8	22.3	22.1	21.9	22.6	22.3	22.2
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.2	8.1	8.1	8.2	8.2	8.3	8.2
Salinity	PSU	—	—	32.5	32.7	32.5	32.4	32.6	32.5	32.2	32.1	32.1
S.S.	mg/L	—	—	7.6	6.4	7.6	10.6	6.8	7.9	6.9	7.9	8.2
C.O.D.	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
B.O.D.	mg/L	≤ 2	≤ 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
D.O.	mg/L	≥ 5.0	≥5.0	6.4	6.4	6.2	6.2	6.1	6.1	6.2	6.1	6.0
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.05	0.07	0.06	0.09	0.08	0.07	0.04	0.08	0.03
Nitrite-N	mg/L	—	—	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
NH3-N	mg/L	0.3	0.3	0.3	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1
Total phosphorus	mg/L	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
T.O.C.	mg/L	—	—	–	<1.0	<1.0	<1.0	1.1	1.0	1.1	<1.0	1.0
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	1	1	0	1	1	0	0	1	1
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	35	180	160	20	85	35	20	170	100
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.089	0.088	0.085	0.088	0.085	0.085	0.086	0.086	0.086
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	N.D.	<0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Cu	mg/L	0.03	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q2 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	26.5	26.1	25.8	26.2	26.0	25.7	26.5	26.2	25.9
pH	-	7.5~8.5	7.5~8.5	8.3	8.2	8.2	8.0	8.1	8.1	8.0	8.2	8.4
Salinity	PSU	—	—	32.6	32.7	32.7	32.3	32.7	32.6	32.1	32.1	32.4
S.S.	mg/L	—	—	5.4	4.7	7.7	6.7	5.1	6.7	8.5	9.4	7.9
C.O.D.	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
B.O.D.	mg/L	≤ 2	≤ 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
D.O.	mg/L	≥ 5.0	≥5.0	6.2	6.1	6.1	5.9	5.9	5.8	6.0	6.0	6.0
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.28	0.27	0.29	0.27	0.27	0.25	0.25	0.27	0.29
Nitrite-N	mg/L	—	—	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
NH3-N	mg/L	0.3	0.3	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Total phosphorus	mg/L	0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
T.O.C.	mg/L	—	—	0.3	1.1	1.1	<1.0	1.1	1.2	1.0	1.1	1.4
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	2	2	2	2	2	2	2	2	2
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	55	1.4×10^2	1.8×10^2	25	40	80	25	1.0×10^2	1.1×10^2
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.041	0.045	0.062	0.046	0.044	0.045	0.046	0.043	0.043
As	mg/L	0.05	0.05	N.D.	N.D.	0.00	0.00	0.00	0.00	0.00	0.00	N.D.
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cu	mg/L	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q3 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	32.5	32.4	32.2	32.2	31.0	30.8	32.2	32.2	32.0
pH	-	7.5~8.5	7.5~8.5	8.1	8.1	8.1	8.3	8.4	8.4	8.3	8.4	8.4
Salinity	PSU	—	—	31.2	31.3	31.4	31.2	31.4	31.2	30.6	30.9	30.6
S.S.	mg/L	—	—	4.0	4.3	4.3	4.8	4.8	4.1	3.6	3.9	3.8
C.O.D.	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
B.O.D.	mg/L	≤ 2	≤ 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
D.O.	mg/L	≥ 5.0	≥5.0	5.8	5.8	5.9	5.8	5.8	5.8	5.7	5.7	5.8
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.23	0.23	0.21	0.25	0.24	0.25	0.24	0.24	0.22
Nitrite-N	mg/L	—	—	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01
NH3-N	mg/L	0.3	0.3	0.0	0.0	0.0	0.0	N.D.	N.D.	0.0	N.D.	N.D.
Total phosphorus	mg/L	0.05	0.05	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
T.O.C.	mg/L	—	—	0.3	1.8	1.6	1.6	2.7	1.7	2.2	2.1	2.4
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	18	16	16	21	18	20	18	17	16
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	<10	<10	<10	65	45	<10	<10	<10	<10
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.036	0.042	0.040	0.028	0.043	0.040	0.040	0.040	0.037
As	mg/L	0.05	0.05	N.D.	0.00	0.00	0.00	0.00	0.00	N.D.	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Cu	mg/L	0.03	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".

◢2022 Q4 monitoring results of harbor area water quality

Monitoring items	Units	A type marine water quality standard (2001.12.26~2018.02.13)	A type marine water quality standard (2018.02.13~)	3H			4H			5H		
Depth	meter			1.0	10.0	20.0	1.0	10.0	20.0	1.0	10.0	20.0
Tepm.	℃	—	—	28.3	28.1	28.1	28.0	27.9	27.8	28.2	28.2	28.0
pH	-	7.5~8.5	7.5~8.5	8.0	8.1	8.1	8.2	8.2	8.3	8.1	8.1	8.1
Salinity	PSU	—	—	31.1	31.3	32.0	32.0	31.8	31.9	30.7	30.9	31.1
S.S.	mg/L	—	—	14.7	13.6	10.7	11.6	13.1	13.9	12.6	13.9	14.4
C.O.D.	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
B.O.D.	mg/L	≤ 2	≤ 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
D.O.	mg/L	≥ 5.0	≥5.0	6.1	6.0	6.0	6.2	6.1	6.1	6.1	6.1	6.0
Cyanide	mg/L	0.01	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nitrate-N	mg/L	—	—	0.26	0.27	0.26	0.25	0.22	0.24	0.26	0.26	0.25
Nitrite-N	mg/L	—	—	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03
NH3-N	mg/L	0.3	0.3	N.D.	N.D.	N.D.	0.0	N.D.	0.0	0.0	0.0	N.D.
Total phosphorus	mg/L	0.05	0.05	0.03	0.01	0.01	0.04	0.02	0.03	0.05	0.03	0.05
T.O.C.	mg/L	—	—	0.3	<1.0	1.0	<1.0	1.1	<1.0	1.1	<1.0	<1.0
Mineral oil	mg/L	2	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorophyll a	g/m^3	—	—	0	0	1	1	1	1	1	0	0
Total phenols	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
E. coli	CFU/100ml	≤ 1000	≤ 1000	25	15	10	<10	10	15	<10	10	<10
Co	mg/L	—	—	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Fe	mg/L	—	—	0.052	0.052	0.040	0.040	0.048	0.051	0.053	0.051	0.052
As	mg/L	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	mg/L	0.002	0.001	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Zn	mg/L	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cr	mg/L	—	—	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pb	mg/L	0.10	0.01	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Cu	mg/L	0.03	0.03	0.00	0.00	<0.0010	0.00	0.00	0.00	0.00	<0.0010	0.00
Cd	mg/L	0.010	0.005	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ni	mg/L	—	0.1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

*Noote：When the measured value is below the method detection limit (MDL), it is indicated as "ND ".