



Quality
Water for
Quality
Living

Sustainability Report 2024
Metropolitan Waterworks Authority



**Quality Water
for Quality Living**

Quality Water for Quality living

Quality Water

1. Deliver high-quality and high-safety water that is suitable for both usage and consumption, while meeting international water quality standards and responding to government policies in addition to sustainably fulfilling the needs and expectations of every stakeholder.
2. Manage the water supply system from upstream to downstream while creating value at appropriate costs according to good governance principles and using knowledge and digital technology to enhance work processes through innovations and the capability to develop high-quality products and services.
3. Operate connected businesses by providing comprehensive waterworks services that deliver value to customers beyond their expectations and in time for their needs to create good customer impressions.

Quality Living

1. Safeguard public interest by ensuring extensive and sufficient access to high-quality, clean, and safe water supply in line with international standards while reducing inequality by using fair prices.
2. Support the national economy for growth, national security, and a sustainable Thai society.
3. Operate the business ethically and for the benefit of stakeholders, society, and the environment.



Vision

Quality Water
for
Quality Living

Missions

1

To operate one-stop core water business adhering to water quality standards for improving the people's quality of life.

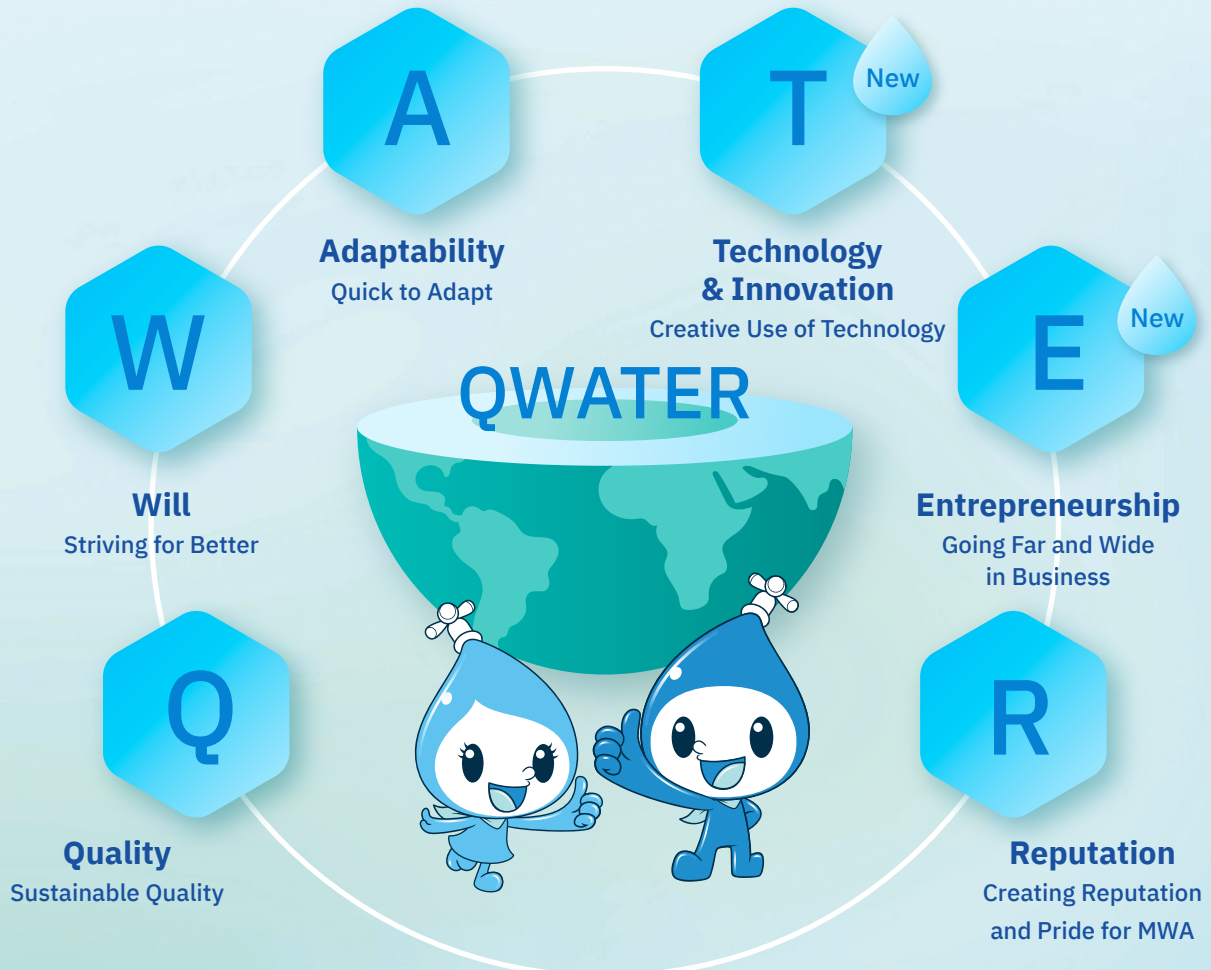
2

To become a crisis-capable organization.

3

To operate related businesses for creating value to stakeholders while creating sustainable organizational growth.

Values





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● Message from the Governor of the Metropolitan Waterworks Authority

“ Amidst technological challenges and changes, economic uncertainties, and climate change impacting water quality, the MWA continues to move ahead toward becoming a ‘Smart Enterprise for Smart Value’ to deliver shared value to stakeholders and drive the enterprise to grow alongside the sustainable development of society according to the vision ‘Quality Water for Quality Living’. ”

In 2024, the MWA entered its 57th year of operations under the vision of “Quality Water for Quality Living”. The MWA remains committed to providing tap water services to residents within its service areas, while continuously improving and developing work processes with technology and innovation to enhance tap water quality and service, ensuring stability and sufficiency for consumption. This commitment supports the rapid growth of Bangkok, Nonthaburi, and Samut Prakan, while responding to global challenges and changes, and addressing the needs of all stakeholders, including in the economic, governance, social, and environmental dimensions.

In terms of economics and governance, the MWA believes that good corporate governance is a key foundation for sustainable business operations. The MWA has established a good corporate governance policy to serve as a framework for managing the enterprise with

good governance while operating with transparency to build confidence among the enterprise’s stakeholders. In 2024, the results of the MWA’s Integrity and Transparency Assessment (ITA) indicated a “Pass with Excellence”, ranking 2nd out of 51 state enterprises and 1st among state enterprises under the Ministry of Interior.

In addition to providing affordable tap water to the public and treating employees at all levels equally, the MWA has continuously emphasized its contribution to improving the quality of life of society. For example, we have expanded the MWA Plumber for People Project in collaboration with correctional institutions by providing vocational training in plumbing to well-behaving inmates to create opportunities and jobs after their release. Furthermore, the MWA has implemented a project to expand access to clean water in watershed communities facing water shortages



through the MWA Plumbing System for School Project, which aligns with government and Ministry of Interior's policies to promote clean, safe, and hygienic water for consumption and to foster sustainable health in upstream communities.

In terms of the environment, to reduce the potential environmental impacts from the enterprise's operations and to reduce the generation of greenhouse gases that cause climate change, the MWA has implemented measures to reduce the amount of electricity used by using solar energy (solar cell) in office buildings, reducing electricity consumption in water transmission and water distribution pumping systems by operating water pumps in these systems suitably according to water pressure specifications. Furthermore, we converted our rental cars into electric vehicles.

Amidst challenges and changes in various areas such as technological advancements, economic uncertainties, and climate change impacting water quality, the MWA continues to move ahead toward becoming a "Smart Enterprise for Smart Value" to provide water supply and waterworks services with expertise, innovation, and technology to deliver shared value to stakeholders and drive the enterprise to grow alongside the sustainable development of society.

(Miss Suwara Thawitchasri)
Governor of the Metropolitan
Waterworks Authority

Sustainability Reporting and Materiality

The Metropolitan Waterworks Authority (MWA) Sustainability Development Report for the fiscal year 2024 discloses operational information for the period from 1 October 2023 - 30 September 2024. The reporting approach aligns with the requirements and principles of the GRI (Global Reporting Initiative) Standards under the “In accordance with” the material topics. It also includes other operational results that are significant to the organization.

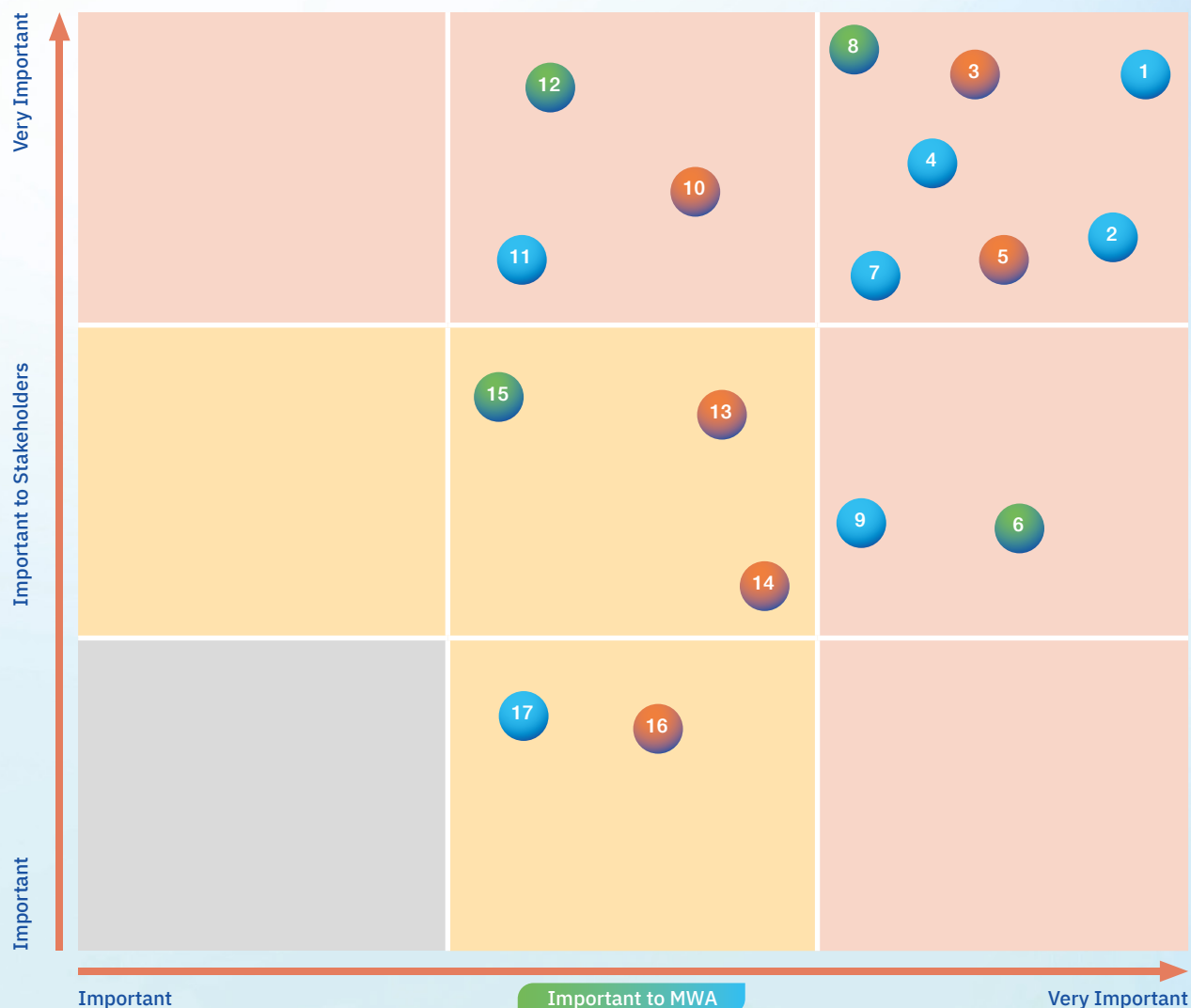
In the fiscal year 2024, the MWA reviewed the material topics of sustainability of the enterprise to dynamically keep up with changes in economic, social, and environmental contexts that impact work processes, productivity, and the main services, not to mention the needs and expectations of stakeholders.

Process for Evaluating Materiality Issues of the MWA



The MWA Materiality Matrix 2024

Prioritization by the MWA



Economic and Governance

1. Transparency and Integrity
2. Effective Communication
4. Business Continuity Management
7. Innovation and Digitalization
9. Partnership and Collaboration
11. Efficiency of Internal Management Processes
17. Accessible and Affordable Services and Product

Social and Human Rights

3. Human Resource Potential Development
5. Quality of Tap Water
10. Occupational Health and Safety
13. Non-Discrimination and Equal Opportunities
14. Employee Benefits and Welfare
16. Local Community

Environmental

6. Water and Effluents
8. Energy
12. Effluent and Waste
15. Greenhouse Gas Emissions Management

Lists of MWA Materialities 2024

Economic and Governance

- Transparency and Integrity
- Effective Communication
- Business Continuity Management
- Innovation and Digitalization
- Partnership and Collaboration
- Efficiency of Internal Management Processes
- Accessible and Affordable Services and Product



Social and Human Rights

- Human Resource Potential Development
- Quality of Tap Water
- Occupational Health and Safety
- Non-Discrimination and Equal Opportunities
- Employee Benefits and Welfare
- Local Community



Environmental

- Water and Effluents
- Energy and Greenhouse Gas Emissions Management
- Effluent and Waste



For more information, please contact:



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Department, Metropolitan Waterworks Authority
(Head Office) 400 Prachachuen Road,
Thung Song Hong Sub-district, Lak Si District,
Bangkok 10210



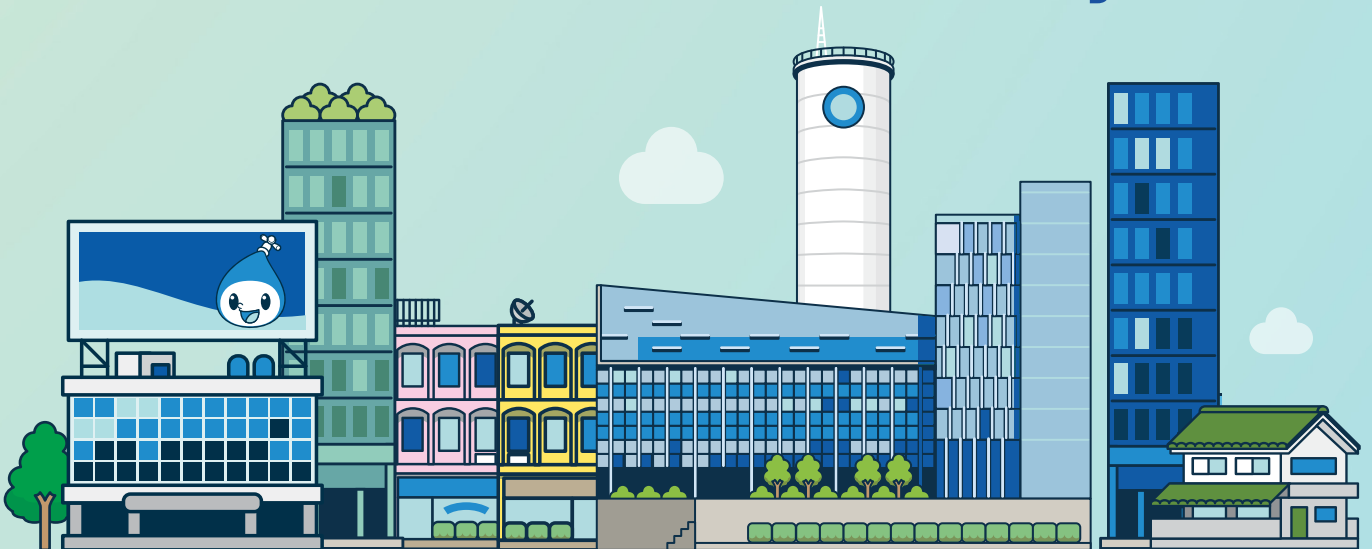
Tel: +66 2504 0123 ext. 1614-1615



E-mail: csr@mwa.co.th



About Metropolitan Waterworks Authority



About Metropolitan Waterworks Authority

On 14 November 1914, His Majesty King Vajiravudh (Rama VI) officially inaugurated the water supply operations, initially called the “Metropolitan Waterworks.” Later, in 1967, due to the rapid expansion of the metropolitan area, the government consolidated the water supply operations of the Department of Municipal Engineering, Nonthaburi Waterworks,

Thonburi Municipal Waterworks, and Samut Prakan Municipal Waterworks into a single entity known as the Metropolitan Waterworks Authority (MWA) on 16 August 1967. MWA operates as a state enterprise under the Ministry of Interior and in accordance with the objectives of the MWA Act, which include:



Exploring and procuring raw water sources for tap water production.



Producing, delivering, and distributing water supply within the service areas covering Bangkok, Nonthaburi, and Samut Prakan.



Conducting other businesses related to or beneficial for water supply operations.

MWA has managed water supply based on the World Health Organization's water-quality standard. It has paid attention to water quality from upstream to downstream so as to comprehensively and adequately provide people with safe and clean water. MWA has integrated innovations and technologies to continuously improve waterworks. Water Safety Plan (WSP) has been drawn up to assure our water supply safety and quality by launching new water pipe replacement projects in various areas while promoting positive relations with communities on the western and eastern sides of the river basin as part of the effort to conserve water resources to enhance the effectiveness of basic water supply infrastructure for sustainability.



MWA Annual Report 2024, Thai version
<https://www.mwa.co.th/about/operate-statistic/annual-report/>



MWA Annual Report 2024, English version
<https://www.mwa.co.th/en/about/operate-statistic/annual-report/>

Remarks: For additional information about the organization's structure or contents beyond the scope of this report, you can read the Metropolitan Waterworks Authority's 2024 Annual Report.

Major Operating Sites

1. Headquarters
2. Control Buildings of Water Transmission and Distribution Systems
3. 18 MWA Branches
4. Training Center
5. 4 Water Pumping Stations
6. 12 Transmission Stations
7. 4 Water Treatment Plants
8. The Water Quality Department and the Water Treatment Plants
9. Control Room of Water Treatment Plants
10. Eastern Waterwork Canal and Western Waterwork Canal



Service Areas

The water distribution areas of MWA cover the Bangkok Metropolis, Nonthaburi, and Samut Prakan regions, totaling 3,195 square kilometers. Raw water is obtained from 2 sources, i.e. the Chao Phraya River and the Mae Klong River, for treatment, transmission, and distribution.

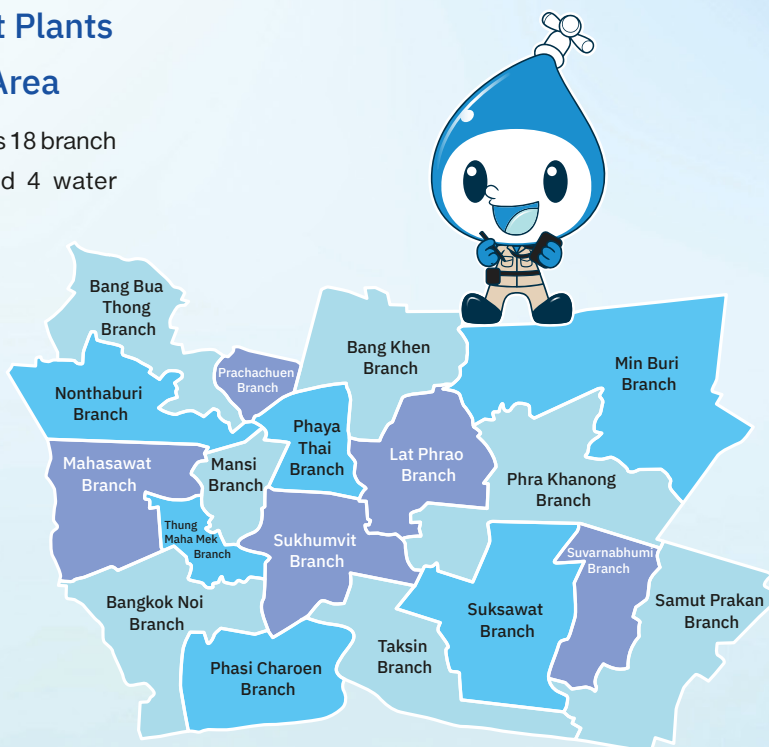
Currently, MWA has delivered tap water to all urban zones in the three provinces, providing residents with access to clean and safe tap water, which enhances their quality of life. MWA services align with the UN Sustainable Development Goal 6 (SDG 6) and the “Ease Sufferings, Nurture Happiness of People” policy of the Ministry of Interior, which supervises MWA.

18 Branches, 4 Water Treatment Plants in 3 Provinces in Every Service Area

Regarding service provision, the MWA has 18 branch offices located in 3 different provinces and 4 water treatment plants in total.

Water Supply Branch Offices

1. Sukhumvit Branch
2. Phra Khanong Branch
3. Samut Prakan Branch
4. Mansri Branch
5. Phaya Thai Branch
6. Thung Maha Mek Branch
7. Lat Phrao Branch
8. Prachachuen Branch
9. Bang Khen Branch
10. Min Buri Branch
11. Suvarnabhumi Branch
12. Taksin Branch
13. Suksawat Branch
14. Bangkok Noi Branch
15. Phasi Charoen Branch
16. Nonthaburi Branch
17. Bang Bua Thong Branch
18. Mahasawat Branch

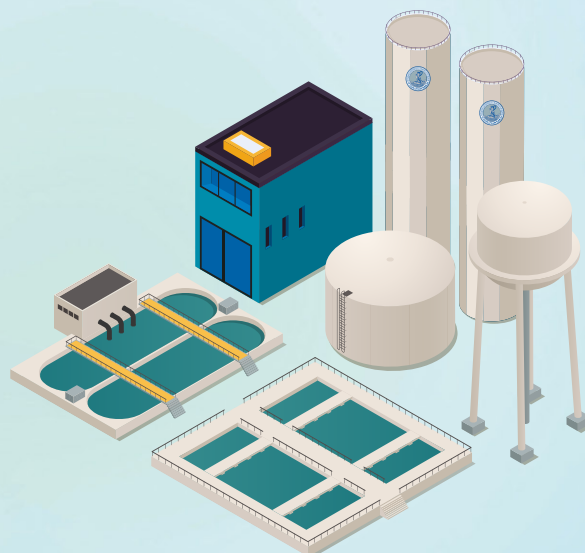


Water Treatment Plants

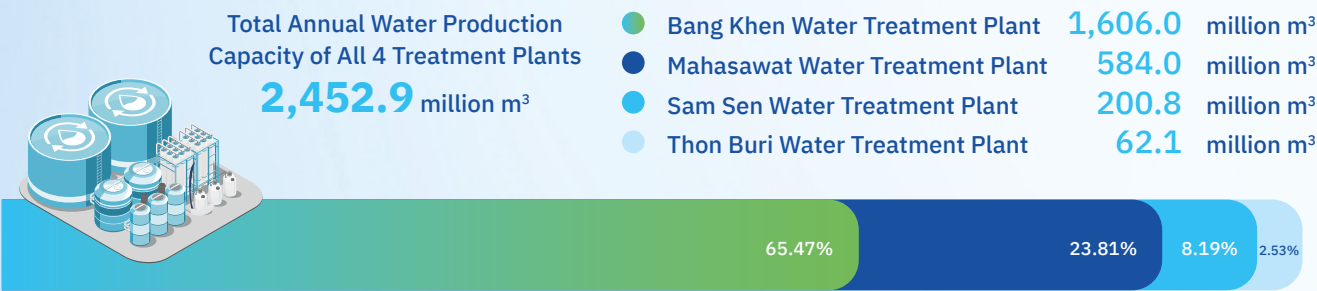
1. Bang Khen Water Treatment Plant
2. Mahasawat Water Treatment Plant
3. Sam Sen Water Treatment Plant
4. Thon Buri Water Treatment Plant

Metropolitan Waterworks Authority (Head Office)

400 Prachachuen Road, Thung Song Hong Sub-district, Lak Si District, Bangkok 10210 Phone: +66 2504 0123



Water Treatment Plants and Annual Water Production Capacity



Water Production and Distribution of All 4 Water Treatment Plants

Water Production Plant	Fiscal Year (million m ³)				
	2020	2021	2022	2023	2024
Total Water Distribution	2,121.1	2,116.5	2,080.3	2,042.4	2,038.1
Bang Khen Water Treatment Plant	1,410.0	1,427.6	1,394.0	1,386.4	1,381.5
Mahasawat Water Treatment Plant	572.3	556.6	560.0	528.3	529.3
Sam Sen Water Treatment Plant	102.4	92.2	86.4	87.3	88.8
Thon Buri Water Treatment Plant	36.4	40.1	39.9	40.4	38.5
Total Water Distribution (million m ³)	1,458.3	1,416.2	1,422.2	1,488.6	1,514.8

Personnel (Fiscal Year 2024)



Customer

In the fiscal year 2024, the MWA reviewed the customer groups for the core business, i.e. provision of water supply services for the entire water life cycle of customers, both today and in the future. This review aimed to plan and set goals and direction for effective marketing consistently with the important and varying needs and expectations of customers. The objective is to deliver positive customer experiences throughout the entire customer life cycle covering development, product and service innovation and customer relationship management.



Current Customer

The current customers of MWA are water consumers in the areas under MWA's responsibility (Bangkok, Nonthaburi, and Samut Prakan) classified by water usage behaviors, business type or size (firmographics),

and needs and expectations. The details of the customer groups, together with their definitions, are summarized as follows:



Residential

- Use water directly for consumption and domestic purposes in households or residences.
- Water usage is mostly concentrated in the morning and from evening through nighttime hours.



Commercial

- Customers who consume water for commercial or corporate purposes.
- Water usage follows the operating hours of each type of business or organization.



Industrial

- Customers who use water for industrial purposes, such as manufacturing.
- Water is used continuously, with some industries consuming water 24 hours a day.

Potential Customer

The analysis of strategic opportunities has identified potential customers, such as those from pipe installations to expand water distribution areas and water sales to people living in fringe areas. This aligns with the government's policy to give the public equal chance to access clean water. For future market growth targets, customers can be divided into 2 groups as follows:



Potential Customer

Customers in the areas under the MWA's responsibility (Bangkok, Nonthaburi, and Samut Prakan) who lack access to water supply, such as water consumers in local administrative organization areas, including consumers of groundwater and other natural water sources.



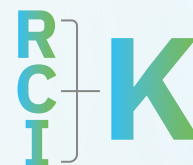
Potential Area

Customers in areas that should have access to water in line with the Ministry of Interior's policy, especially in fringe areas.

In addition, key accounts that are customers with a high average monthly water consumption of over 10,000 cubic meters per month have been identified for customer relationship management (CRM).

Key Account

- RCI customer group with an average monthly water consumption of 10,000 cubic meters or more.



Number of Customers by Water Usage Behaviors, Business Type or Size, and Needs and Expectations for 2021-2024

	2021 (Customers)	2022 (Customers)	2023 (Customers)	2024 (Customers)
R Customers	2,062,489	2,109,622	2,115,868	2,191,636
C Customers	450,332	444,371	444,771	451,295
I Customers	4,665	4,425	4,460	5,002
All Customers	2,517,486	2,558,418	2,565,099	2,647,933

Data as of 30 September 2024

Diagram of Water Treatment



Remarks

- The monitoring and analysis of water quality within the water production system are carried out by the laboratory of the water treatment plants, which is accredited in accordance with recognized standards, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 22301:2019, GHP, and HACCP.
- Water quality inspection and monitoring are conducted in accordance with the 2022 guidelines of the World Health Organization. Analyses are performed by the Water Quality Department's laboratory, which is accredited under ISO/IEC 17025:2017 and complies with ESPReL safety standards.
- Online Water Quality Monitoring System of the Water Resources and Environment Department.

Unit: million m³/day

Water Treatment Plant

Max. Production Capacity

Sam Sen Water Treatment Plant	0.42
Thonburi Water Treatment Plant	0.10
Bang Khen Water Treatment Plant	4.20
Mahasawat Water Treatment Plant	1.60

11 Consumers



9 Surge Tower

To reduce water back pressure and protect the pump from water hammer damage.

8 Transmission Pumping Station

To pump water from the clear water reservoir of the water treatment plant into the water transmission tunnel and large water pipelines to various distribution pumping stations.



10 Distribution Pumping Station

To pump and distribute tap water through the water pipeline network to consumers in various areas.

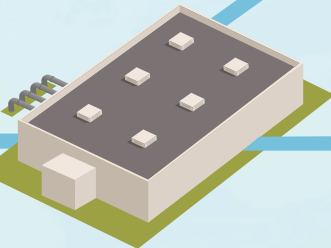


11 Consumers



7 Clear Water Reservoir

The filtered water is chlorinated in the clear water storage tank before being distributed as tap water to consumers.



10 Distribution Pumping Station

To pump and distribute tap water through the water pipeline network to consumers in various areas.



Intro

Economic

Social

Environmental

● MWA's Operating Direction and Policy

The MWA is a state enterprise under the Ministry of Interior, established under the Metropolitan Waterworks Authority Act, B.E. 2510 (1967) (MWA Act). Our primary mission includes conducting surveys to procure raw water and obtaining raw water supply to produce, deliver, and supply tap water in the Bangkok, Nonthaburi, and Samut Prakan areas while controlling standards related to private waterworks systems in the area. We also operate other businesses that are related to or beneficial to the MWA, and we play an important role in driving government policies for developing the national economy and society consistently and in line with environmental changes.

In setting its direction and operating policy, the MWA considers and gathers information from both internal and external sources related to the enterprise. This includes global mega trends, sustainability factors, stakeholders' needs and expectations, and engagement with the MWA's board of directors, subcommittees, high-ranking executives, and personnel. Additionally, we analyze strategic advantages and challenges, as well as the enterprise's core competencies, to review and set the enterprise's direction.



2024

The background image shows a hand pointing at a digital interface. The interface features a large '2024' in the center, a line graph with a rising trend, and three circular progress indicators on the right showing 44%, 76%, and 98%. The overall theme is digital and futuristic, with blue and white tones.

MWA's Value Chain

The MWA's core mission is to distribute quality tap water and provide services in response to customers' needs, with operations that are in compliance with guidelines, standards, and good corporate governance, which are divided into three main categories:

Management Process

It is related to executions that require the engagement of all executives to drive processes in order to meet requirements and targets. It also includes the determination of the future direction, which focuses on creating growth and sustainability of the organization.

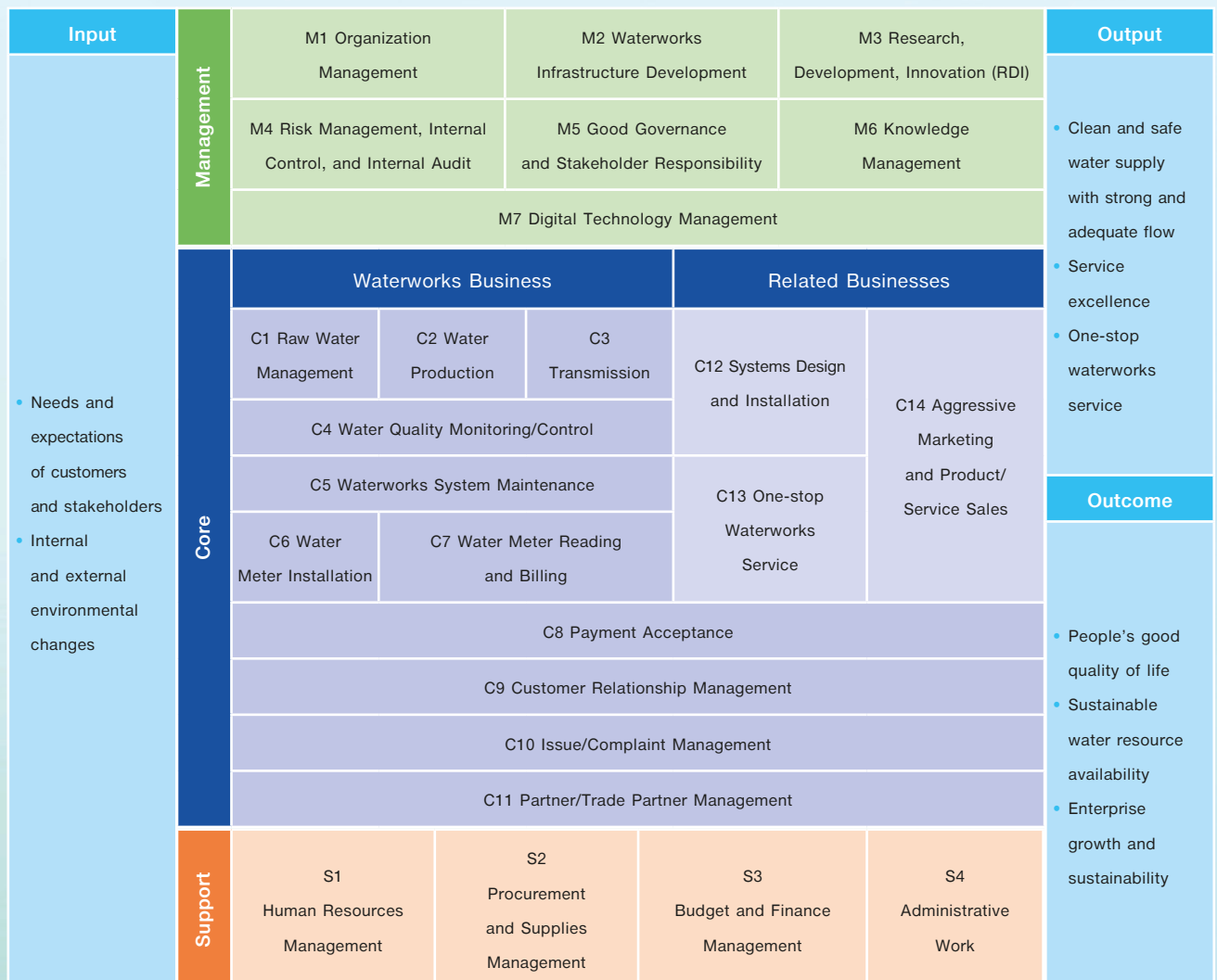
Core Process

The core process is vital and directly affects corporate achievement. It is a process that delivers value to customers and stakeholders. It consists of:

- Operations: Encompasses processes related to product and water supply delivery, with a strong focus on quality and efficiency.
- Customer: Encompasses processes related to customer service, emphasizing service delivery in line with commitments.

Support Process

It is a process that supports and encourages the achievement of core processes, which facilitate smooth corporate management, focusing on its efficiency and effectiveness. Every process is aimed at delivering valuable products and services to customers and stakeholders sufficiently and comprehensively in every service area, in addition to supporting the sustainable economic and social development of the country.



Supply Chain Management and Sourcing

The business management process starts from intake of raw materials and resources, work structures, and related technologies to enable the enterprise to effectively deliver products and services according to the quality and time specifications of customers, including having an appropriate guideline for procurement, raw material, and service procurement in order to meet the needs of business opportunities.

The Code of Ethics in the MWA's operations refers to the good practice guidelines for operating according to the main missions and businesses related to the enterprise under the framework of justice and ethics, which gives equal importance to all stakeholders, including promoting the good image and protecting the interest of the MWA.

The MWA has set the Code of Ethics for our operations with accountability toward our trade partners and/or creditors as follows:

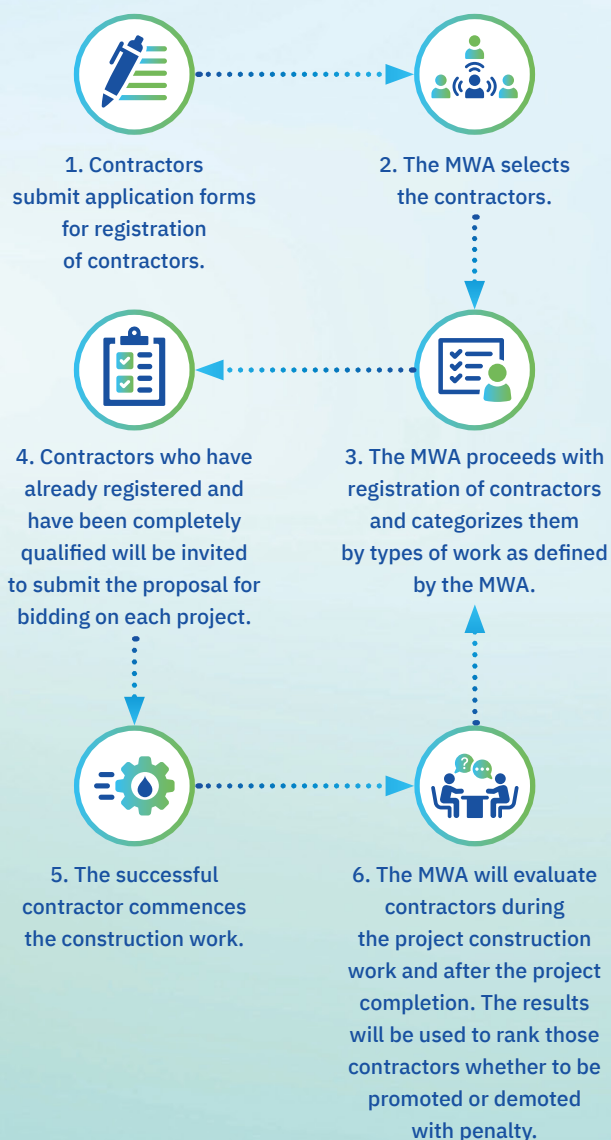
1. Strictly comply with agreed terms and conditions without violating the rights of trade partners and/or creditors.
2. Protect the interest of stakeholders. For example, in cases where it is not possible to follow an agreed condition, it is necessary to swiftly notify trade partners and/or creditors in advance in order to jointly seek immediate solutions.
3. Promote fairness and equality among all trade partners and/or creditors with transparency and auditability.
4. Follow the MWA's Anti-Corruption Policy by refusing to give, accept, or pay dishonest benefits to trade partners and/or creditors.

Guidelines for Contractor's Selection and Evaluation

We have established procurement standards with a systematic process to select contractors and evaluate their performance. This is to ensure efficiency and effectiveness toward all actions as defined. Moreover, we have applied various rules and regulations into the practice so as to develop the organization in all aspects, alongside operating its business based on good corporate governance principles.

The processes of water production and distribution require contractors to complete the construction of various projects. Therefore, contractors' selection and evaluation are considered one of our core missions under the MWA's regulations on registration and evaluation of contractors' performance to obtain contractors who hold quality and potential to operate construction works of various projects to be completed within the specified time and with orderliness.

The purpose of this action is to control the quality of construction work in various projects to achieve the objectives as defined and create satisfaction for users to consume water that meets quality and is sufficient for consumption, and does not create negative impacts on the people and communities. The details of these processes are described below:







MWA Sustainable Development Policy



MWA Sustainable Development Policy

Criteria, Regulation, and Authority That the MWA Deploys as a Framework for Economic, Social, and Environmental Development

The MWA is a state-owned enterprise under the supervision of the Ministry of Interior, established under the Metropolitan Waterworks Authority Act, B.E. 2510. Thus, our roles and duties are following the laws, regulations, and standards, which are summarized as follows:

Laws/Rules/Regulations	Details of Relevant Laws and Regulations
 <p>Occupational Health and Safety</p>	<ul style="list-style-type: none"> Occupational Safety, Health, and Workplace Environment Act, B.E. 2554 (2011) Ministerial Regulation on Assigning Safety Officers to the Work of Agency Personnel or Groups of Persons to Perform Safety Activities in the Place Business, B.E. 2565 (2022) Ministerial Regulation on Prescribing Standards for Health Examinations of Employees Engaged in Work Involving Risk Factors, B.E. 2563 (2020) Notification of the State Enterprise Labor Relations Board on the Minimum Standards for Employment Unions Notification of the Department of Labor Protection and Welfare on Determination of Personal Safety Equipment Standards, B.E. 2554 (2011) Notification of the Department of Labor Protection and Welfare on Warning Signs, Symbols of Occupational Safety, Health, and Working Environment and Messages Showing Rights and Duties of Employers and Employees, B.E. 2554 (2011) Announcement of the Department of Labor Protection and Welfare on the Training or Development of the Knowledge of Safety Officers in Performing Technical Work, Advanced Technical Work and Professional Work Related to Additional Work Safety Announcement of the Ministry of Public Health on Notification and Reporting of Encounters with People Who Have or Are Reasonably Suspected to Have Contracted Illnesses from Work or from Environmental Infections, B.E. 2565 (2022) State Enterprise Labor Relations Act, B.E. 2543 (2000). Labor Protection Act, B.E. 2541 (1998) Etc.
 <p>Certification or Registration for License to Operate</p>	<ul style="list-style-type: none"> Metropolitan Waterworks Authority Act, B.E. 2510 (1967) Codes of Conduct Royal Decree on Criteria and Procedures for Good Country Administration (No. 2), B.E. 2562 (2019) World Health Organization (WHO) Electronic Transactions Act, B.E. 2544 (2001) Electronic Transactions Act (Amendment), B.E. 2562 (2019) Factory Act, B.E. 2535 (1992) Arms Control Act, B.E. 2530 (1987) Hazardous Substance Act (No. 3), B.E. 2551 (2008) Government Administration and Services through Digitalization Act, B.E. 2562 (2019)

Laws/Rules/Regulations	Details of Relevant Laws and Regulations
 <p>Industry Standards</p>	<ul style="list-style-type: none"> • WHO's Guidelines for Drinking-water Quality, 4th Edition, Incorporating the First Addendum • Good Manufacturing Practice: GMP • Hazard Analysis and Critical Control Points: HACCP • ISO 9001:2015 Quality Management System • ISO/IEC 17025:2005 Operating Noise Quality Assurance System • ISO/IEC 27001:2013 Information Security Management System • ISO/IEC 29110 Diagnosis and Recommendation System to Guide in Enhancing the Software Development • ISO 26000 Social Responsibility Guidance Standard • Notification of the Department of Health on Criteria for Drinking Water Quality, Department of Health, B.E. 2563, dated 13 July 2020 • Notification of the Department of Health on Recommendation Criteria for Drinking Water Quality for Surveillance, Department of Health, B.E. 2563, dated 13 July 2020 • Notification of the Metropolitan Waterworks Authority on the Criteria for Determining the Water Quality of the Metropolitan Waterworks
 <p>Environmental, Financial, and Product Management</p>	<ul style="list-style-type: none"> • Budget Procedures Act, B.E. 2502 (1959) • Rule of the Office of the Prime Minister on Investment Budget of State Enterprises, B.E. 2550 (2007) • Rule of the Ministry of Finance on Accounting and Finance of State Enterprises, B.E. 2548 (2005) • Government Procurement and Supplies Management Act, B.E. 2560 (2017) • State Fiscal Discipline Act, B.E. 2561 (2018) • ISO 14001:2015 Environmental Management System • WHO's Guidelines for Drinking-water Quality, 4th Edition, Incorporating the First Addendum • Groundwater Resources Act (No. 3), B.E. 2546 (2003) • Facilitation of Government Authorization Act, B.E. 2558 (2015) • Public-Private Partnership Act, B.E. 2562 (2019) • National Environmental Quality Promotion and Conservation Act, B.E. 2535 (1992) • Energy Conservation Promotion Act, B.E. 2535 (1992) • Ministerial Regulation prescribing rules, methods, and forms for collecting statistics and data, preparation of detailed records and a performance report of the wastewater treatment system, B.E. 2555 (2012) • Notification of the Ministry of Natural Resources and Environment on Determination of Wastewater from Factory, Industrial Estate, and Industrial Zone • Notification of the Ministry of Industry, Subject: Determination of Standards for Controlling Wastewater Discharge from Factory, B.E. 2560 (2017) • Notification of the Ministry of Industry on Disposal of Sewage or Disused Material, B.E. 2548 (2005) • Announcement of the Ministry of Industry on the Management of Waste or Scrap Materials, B.E. 2566 (2023)
 <p>Others</p>	<ul style="list-style-type: none"> • Government News and Information Act, B.E. 2540 (1997) • Computer Crime Act, B.E. 2550 (2007) • Personal Data Protection Act, B.E. 2562 (2019) • Cyber Security Act, B.E. 2562 (2019) • Criteria for assessing the work processes and management (enablers) of the state enterprise • Government shareholder policy guidelines (state of direction: SOD) on the state enterprise • Announcement of the State Enterprise Policy Office on the State Enterprise • Development Plan, B.E. 2566-2570 (2023-2027)

In addition to the primary missions in the extensive treatment, transmission, and service provision of water supply to consumers in service areas, the MWA is committed to operating according to sustainable development guidelines. These guidelines are consistent with the Sufficiency Economy Philosophy and the Sustainable Development Goals, which form the framework for global development set by the World Health Organization and the action plans for driving the development of Thailand. We aim to achieve this by relying on the BCG economic model (2021-2027) and

the MWA's Enterprise Roadmap. This involves enhancing management effectiveness and basic water supply infrastructure from upstream to downstream to create value and support the government's policies while meeting the needs and expectations of stakeholders in a balanced way. We also strive to build confidence by adhering to good corporate governance principles with fairness, transparency, responsibility, and continuous innovation. The MWA Board of Directors has announced the MWA Sustainable Development Policy as a guideline for the organization's operations as follows:

<p>1</p> <p>Strictly comply with related laws and specifications and respect international practice guidelines.</p>	<p>2</p> <p>Keep in mind economic, social, and environmental balance and promote the development of the Bio-Circular-Green Economy (BCG Model) for all stakeholders to achieve sustainable growth for the organization.</p>	<p>3</p> <p>Raise awareness about the value of water resources, energy conservation, and greenhouse gas emission reduction among MWA personnel and effectively communicate and disseminate this awareness to outside parties.</p>
<p>4</p> <p>Raise awareness of the MWA Sustainable Development Policy in every stakeholder group and promote the adoption of sustainable practice guidelines in order to reduce impact across the entire value chain.</p>	<p>5</p> <p>Promote the continuous development of work innovations and technologies and develop the enterprise's personnel to possess sufficient skills to keep up with technological changes for the benefit of society and the environment.</p>	<p>6</p> <p>Adhere to the principle of being a good citizen of society and use the MWA's expertise to improve the quality of life of important communities to achieve overall sustainability in the rest of society.</p>
<p>7</p> <p>Emphasizes that executives, employees, and staff members are responsible for supporting, promoting, and carrying out their duties in alignment with the Sustainable Development Policy until it becomes part of the organizational culture.</p>	<p>8</p> <p>Disclose policies, management practice guidelines, work performance, and impact from various activities that positively and negatively reflect the organization to stakeholders on the economic, social, and environmental dimensions, and do so transparently in order to promote understanding about the direction and corporate social responsibility processes of the enterprise with the aim of achieving sustainable development.</p>	

Accordingly, the executives, employees, and workers of the MWA have the duty to support, push for, and take action consistently with the enterprise's Sustainable Development Policy in order to lay the essential foundation for the sustainable development of the enterprise. The MWA has also specified the MWA Good Governance Policy and the MWA CSR Policy to provide the operational framework to be adopted by personnel in working with consideration to social and environmental policy and according to the principles of good governance and transparency. We have also announced the Stakeholder Management Policy to establish a standard for the equitable treatment of all stakeholders.



Scan QR Code to view the MWA Good Governance Policy.



Scan QR Code to view the Stakeholder Management Policy.



MWA Stakeholder Engagement



MWA Stakeholder Engagement

MWA Stakeholder Identification

In the fiscal year 2024, from reviewing and identifying stakeholders according to the AA1000:2015 international guideline with thorough consideration covering work processes across the entire value chain, the MWA eliminated the activists/independent organizations/civil societies/academics category. This decision was made due to the limited information available for each of

the aforementioned stakeholders in the MWA's stakeholder data management database. Consequently, the data for this group was merged with the communities and society category, and definitions were expanded for greater coverage. As a result, the MWA's stakeholders decreased from 9 groups to 8 groups as follows:



1. **Policy agencies and government shareholders** refer to agencies responsible for governing and supervising state enterprises, including the Metropolitan Waterworks Authority, and various subcommittees appointed by the MWA.



2. **Mission-based Related Agencies** refer to government agencies whose tasks are shared with the MWA.



3. **Suppliers** refer to agencies or juristic persons or individuals who receive remuneration for providing products, services, lease contracts, and personnel for the MWA.



4. **Alliances** refer to agencies, organizations, or groups of people who agree to work with the MWA to achieve mutual objectives. Partners are subdivided into 2 groups as follows:

- Business Alliances, for example, those involved in payment processor appointment contracts.
- Academic Alliances, for example, agencies or individuals who receive funding from the MWA to conduct research.



5. Customers The MWA classifies customers based on water products that cover the customer's life cycle, including current and potential customers, as follows:

- **Current Customers** are water supply consumers in the MWA service areas under the MWA's responsibility (Bangkok, Nonthaburi, and Samut Prakan) divided by behavior, firmographics, and needs into 3 main groups as follows:
 - Residential (R): These customers use water directly for utility and consumption purposes in residential areas, with peak usage mostly occurring in the morning hours and evening hours.
 - Commercial (C): These customers use water commercially or in corporations with a scheduled water usage format according to the working hours of each business or corporation.
 - Industrial (I): These customers use water industrially, such as in production involving continuous usage, with some industries using water for 24 hours daily.
- **Potential Customers** are specified according to the government's policy in favor of giving the public equal access to clean water and specified according to strategic opportunities for selling water in fringe areas. Therefore, these customers are divided into 2 groups as follows:
 - Potential Customer: These customers are in the areas under the MWA's responsibility (Bangkok, Nonthaburi, and Samut Prakan) who lack access to water supply, such as water consumers in local administrative organization (LAO) areas, including consumers of groundwater and other natural water sources.
 - Potential Area: These customers are in areas that should have access to water in line with the Ministry of Interior's policy, especially in fringe areas.



6. Employees and Workers

- **Employees** refer to personnel working under permanent contract employment with MWA who perform their duties according to each job description.
- **Workers** refer to personnel working under temporary contract employment who perform their duties as prescribed in employment contracts and supervised by the MWA, namely workers of private companies and agents.
 - Subcontracted workers refer to personnel hired by the MWA through the MWA's contractors on an annual basis. It is divided into 4 groups:
 1. Administrative,
 2. Mechanic,
 3. Automotive, and
 4. Other groups, such as workers and welders.
 - Representatives refer to personnel hired by the MWA to provide service to water consumers under the rules and practices prescribed by the MWA. Each contract renewal shall not be more than 3 years, namely
 1. Billing and payment services,
 2. Wiring binding, and
 3. Flow Meter reading.



7. Community and Society

- **Community** refers to
 1. Communities along the Waterworks Canal (west) located in Kanchanaburi, Ratchaburi, Nakhon Pathom, and Nonthaburi with a total distance of 107 kilometers, and communities along the Waterworks Canal (East) located in Pathum Thani, with a distance of approximately 30 kilometers.
 2. Communities in the service areas.
 3. Downstream Communities along the Mae Klong and the Chao Phraya basins.
- **Society** refers to the people who are not directly affected by the operations of the MWA but those who live in the areas where there is potential for improving/promoting the quality of life.



8. Media refers to a person who is a media professional, or a person or a group of persons, whether they are juristic persons or not, who operate the media. It acts as a medium for conveying communication content of all types to the public, whether in the forms of print media, radio broadcasting, television, digital media, or any other forms of media that can convey such communication content to the public in general.

Engagement Channels and Expectations of Stakeholders

In order to understand and know about the needs and expectations of all stakeholders of the MWA, engagement has been built with stakeholders via various channels as follows:

Stakeholder	Engagement Channel	Frequency	Stakeholder Expectations	MWA's Materiality Topics	Response to Stakeholder Expectations
Policy Agencies and Government Shareholders	• Meetings	• More than once per year	• The MWA is expected to urgently reduce water loss.	• Water and Effluents	• Water-saving efficiency project (water-saving labels)
	• Platform for expressing opinions	• Once per year	• The MWA should proactively solve problems by reducing energy use by at least 20 percent, according to the Cabinet resolution by considering the use of electric vehicles in the MWA's agencies.	• Energy	• Water loss management in the water distribution system
	• Participation in MWA's activities	• More than once per year		• Greenhouse gas emissions	• Reuse of water from the treatment process
	• Satisfaction surveys	• Once per year		• MWA business sustainability policies	• Floating solar and solar rooftop electricity generation system installation projects
			• The MWA's activities should be consistent with acts and laws related to factory business operations.	• Quality of Tap Water	• Energy conservation measures
Mission-based Related Agencies	• Meetings	• 2-4 times/month	• It is expected that the MWA and the Department of Groundwater Resources will exchange data in real-time.	• Effluent and Waste	• Water quality management systems such as GHP, HACCP, ISO 9001, ISO 14001
	• Participation in MWA's activities	• Year-round		• Efficiency of Internal Management Processes	
	• Satisfaction surveys	• Once per year	• Problems were found with repairs to return areas by the MWA, which failed to restore original conditions through repairs.	• Occupational Health and Safety	
			• Management of raw water sources during crises to mitigate water quality impacts.		
				• Partnership and Collaboration	• Promotion and enhancement of relationships with related agencies in task-based activities to reduce problems in water-pipe installation areas

Stakeholder	Engagement Channel	Frequency	Stakeholder Expectations	MWA's Materiality Topics	Response to Stakeholder Expectations
Customers	<ul style="list-style-type: none"> Channels like Touch Point, MWA branch offices, 1125 Call Center, CRM activities (MWA Meets the People / Top-Tier / consumer satisfaction surveys (surveys / in-depth interviews / focus groups), etc. Social media such as Facebook / X / LINE@ / social monitoring, etc. Applications such as MWA onMobile 	<ul style="list-style-type: none"> At all times 	<ul style="list-style-type: none"> It is necessary to install and repair pipes according to standards throughout the entire process from start to finish, whether in terms of public relations, construction standards, and access and contacts with related parties. The MWA needs to proactively engage in public relations and inform consumers to reserve water in advance. 	<ul style="list-style-type: none"> Business Continuity Management Quality of Tap Water Effective communication 	<ul style="list-style-type: none"> Water Safety Plan
Employees and Workers	<ul style="list-style-type: none"> Progress performance announcements and opportunities for Q&A Enterprise engagement surveys 	<ul style="list-style-type: none"> Twice per year Once per year 	<ul style="list-style-type: none"> Management to increase knowledge and skills to ensure strategic performance and effective performance of assigned missions. Improvement of medical treatment welfare. A performance evaluation system is needed to reduce use of discretion by supervisors. 	<ul style="list-style-type: none"> Human Resource Potential Development Employee Benefits and Welfare Non-Discrimination and Equal Opportunities 	<ul style="list-style-type: none"> Projects to enhance employee potential Personnel performance evaluations Employee benefits and welfare
Suppliers	<ul style="list-style-type: none"> Platform for expressing opinions Satisfaction surveys 	<ul style="list-style-type: none"> Once per year Once per year 	<ul style="list-style-type: none"> The MWA is expected to invite suppliers to participate in meetings for communication and to hear problems/shared opinions of suppliers. The MWA needs to participate in setting a central price that reflects the actual operating costs. The MWA needs to undertake procurement by e-bidding via a transparent process. 	<ul style="list-style-type: none"> Supply chain and procurement management MWA contractor selection and evaluation process Joint trade partner training for potential development 	<ul style="list-style-type: none"> Fair market competition policies and practice guidelines MWA contractor selection and evaluation process Joint trade partner training for potential development

Stakeholder	Engagement Channel	Frequency	Stakeholder Expectations	MWA's Materiality Topics	Response to Stakeholder Expectations
Alliances	<ul style="list-style-type: none"> Satisfaction surveys 	<ul style="list-style-type: none"> Once per year 	<ul style="list-style-type: none"> The communication system of the internal agencies of the MWA must be developed to swiftly respond to collaboration with payment service providers. Hold activities to discuss public sector debt work management involving 5 state enterprises (MWA, PWA, PEA, MEA, NT). 	<ul style="list-style-type: none"> Partnership and Collaboration 	<ul style="list-style-type: none"> Coordination and collaboration with partners to enhance services
	<ul style="list-style-type: none"> Platform for expressing opinions CSR activities Satisfaction surveys MWA Meets the People activities Social media of the MWA 	<ul style="list-style-type: none"> Year-round More than once per year Once per year 72 times per year (18 MWA branch offices hold 4 activities per year per branch.) Year-round 	<ul style="list-style-type: none"> The MWA is expected to hold activities continuously with communities to reduce relationship gaps and promote understanding about the MWA's operations. The MWA needs to proactively organize activities to build relations and increasingly meet with the communities. 	<ul style="list-style-type: none"> Local communities Occupational health and safety Accessible and Affordable Services and Product 	<ul style="list-style-type: none"> Project to participate in major community development activities Emergency plan rehearsal at all 4 water treatment plants
Media	<ul style="list-style-type: none"> Performance announcements Opening ceremonies for important events Sponsorship and participation in media activities such as founding anniversary events and media events Giving interviews and information to the media The MWA's social media News for the media Unofficial meetings with the media (individual outlets) Opinion surveys 	<ul style="list-style-type: none"> Once per year More than 6 times per year Year-round Year-round Year-round Weekly Year-round Once per year 	<ul style="list-style-type: none"> Accurate, fast, and timely access to news and information. 	<ul style="list-style-type: none"> Transparency and integrity Effective communication 	<ul style="list-style-type: none"> MWA Office Information Center

Annual Action Plan for Stakeholder Engagement Promotion in 2024

The MWA has created an annual stakeholder engagement promotion action plan under the MWA's Stakeholder Master Plan (2023-2027), Revised Edition 2023,

with all department-level agencies operating according to the action plan under 5 themes as follows:



1. Proactive Communication:
Promoting the image of
a sustainable enterprise



**2. Enhancing Stakeholder
Engagement:** Strengthening
connections with stakeholders



3. Disseminating Knowledge:
Sharing information to improve
work effectiveness



4. Exchanging Knowledge: Facilitating
the exchange of knowledge in
management, innovations,
and digital technology



5. Building Good Relationships:
Fostering positive relationships
to enhance services

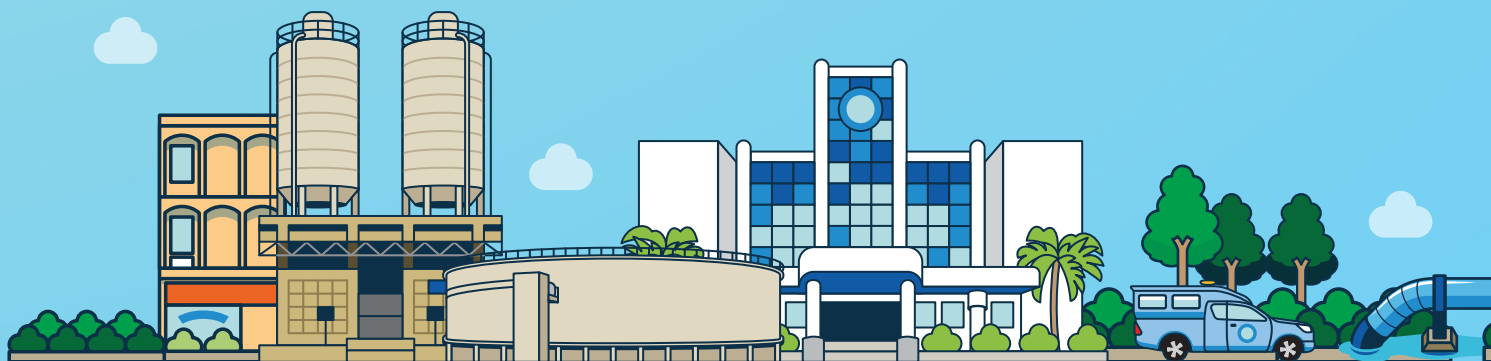
The implementation of this plan will lead to improved relations and satisfaction among stakeholders. In the fiscal year 2024, the stakeholder satisfaction survey on activities carried out under the plan achieved a score of 4.43 out of 5.



Scan the QR code to see our
performance in the Stakeholder
Engagement Promotion plan
in 2024



Governance and Economic Performance



- Transparency and Integrity
- Effective Communication
- Business Continuity Management
- Innovation and Digitalization
- Partnership and Collaboration
- Efficiency of Internal Management Processes
- Accessible and Affordable Services and Product



Transparency and Integrity



Corporate Governance

To create sustainable business values, the MWA Board of Directors has attached great importance to good corporate governance principles by governing and monitoring the performance of the executives to achieve missions, objectives, and goals efficiently. Moreover, this requires it to be in response to government policies and to conduct its business ethically, apparently, and transparently, along with the environmental and social responsibilities, upholding respect for the rights of all stakeholders.

Legal and Regulatory Compliance (Compliance Unit)

The MWA provides oversight to ensure compliance with laws and regulations through the “Compliance Unit”, which has the Deputy Governor (Administration) serving as a chairman. The Assistant Governor (Internal Audit Office) serves as the committee’s advisor, and executives from the deputy governor level, representing every section, comprise the remainder of the committee. The Director of the Legal Department acts as the secretary, responsible for preparing compliance reports to the Governor in accordance with the MWA’s requirements.

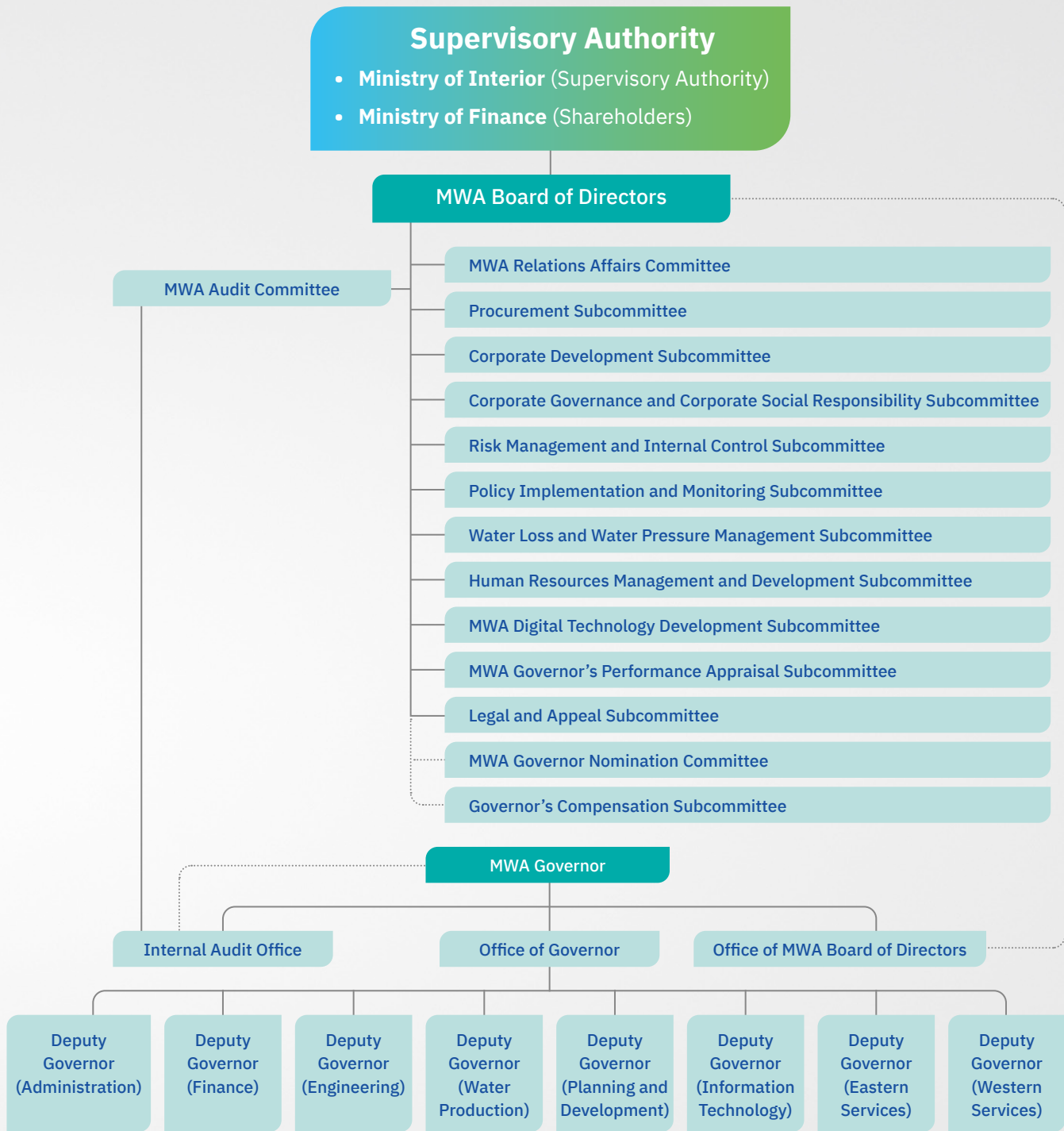
The Committee has responsibilities and powers in supervising and monitoring the performance of the MWA according to laws and regulations and in proposing recommendations, working guidelines, and operating requirements. The Legal Department, as the secretary, works together with various other agencies to compile and create a database of laws and regulations related to the operations of the MWA to create work processes for performance reporting according to laws and regulations. Agencies responsible for processes

(1st Line of Defense) provide assessment and reporting of performance, while the Legal Department (2nd Line of Defense) of directors in order to set working guidelines or performance requirements in compliance with laws and regulations.

In the 2024 fiscal year, the Compliance Unit played a role in supervising and monitoring the operations of the MWA according to laws, regulations, and requirements and in making considerations in expressing opinions about problems arising from compliance to laws, regulations, and requirements and making practice guideline recommendations to related agencies for further action according to the law. The Compliance Unit also engaged in other important activities consistently with the enterprise’s policy such as reviewing the Code of Ethics of the Governor and employees of the MWA, reviewing authorization of the list of laws, regulations, and requirements related to business continuity, and making considerations to authorize risk and opportunity assessment results and assessments of compliance to laws, regulations, and requirements.

Structure, Roles, and Duties of the Board of Directors

Structure of the MWA Board of Directors⁽²⁻⁹⁾



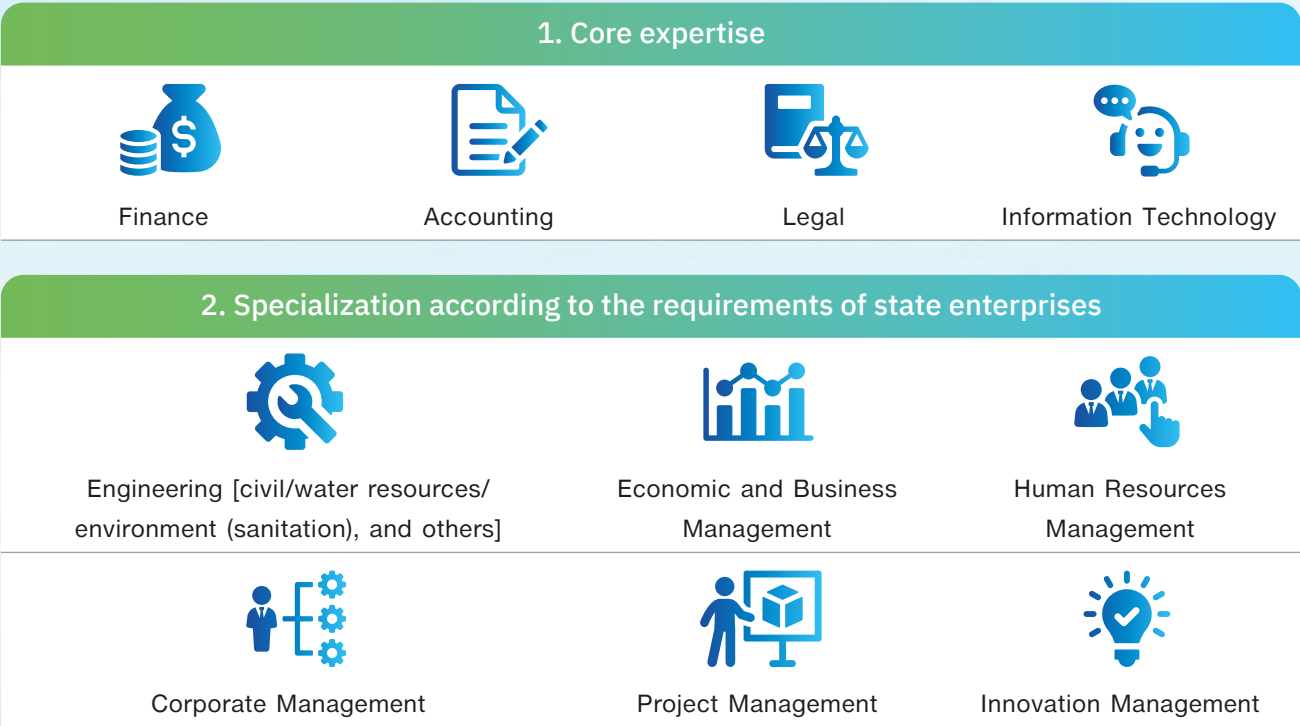
The Standard Qualifications of State Enterprise Directors and Employees Act, B.E. 2518 (1975), states that the board of directors of the state enterprise will consist of a chairman of the board and at least 9 other directors without exceeding 13 directors and that governors will be directors by virtue of their position. Accordingly, the board of directors of the MWA has the authority to appoint committees and

subcommittees to assist in screening work in different areas, whether economic, social, or environmental in nature. Furthermore, senior persons and executives of the MWA have been appointed to serve as directors, subcommittee directors, or secretaries to support, screen, and report on various performance areas. (For details about the various subcommittees, see the 2024 Annual Report).

MWA Board of Directors Selection Process⁽²⁻¹⁰⁾

The MWA Board of Directors is appointed by the Cabinet.

- Each Director is required to be qualified and hold no prohibited characteristics as prescribed in the Metropolitan Waterworks Authority Act, B.E. 2510 (1967) and the Standard Qualification Act for State Enterprise Directors and Officials, B.E. 2518 (1975). This also includes other related laws, for example, holding a Thai nationality, age of not more than 65 years old, having qualifications and experiences that suit the MWA business, and having sufficient and skillful knowledge in waterworks, engineering, economics, law, political science, or business administration.
- The Chairman of the Board and other Directors are required to hold a three-year office term, except that the replacement can only hold office for the remaining term of the person he or she replaces, and the Governor is required to be under the employment contract. However, the retired Chairman of the Board and Directors may be reappointed.
- To be aligned with the corporate mission and strategic plan, the Skill Matrix Method is required to apply for consideration of nomination and appointment of the Committees, consisting of:



Roles and Responsibilities of the MWA Board of Directors

- **Enterprise Direction Setting:** The MWA Board works with the management to determine the vision, mission, operational direction, strategic plans, and goals, and approves the preparation/review of the MWA's enterprise plans, annual operational plans, and budgets, along with providing observations and suggestions to serve as a clear operational framework for the enterprise. Management also communicates policies and goals to employees at all levels and monitors compliance with the established plans.
- **Supervision of the Implementation of Work Plans:** The MWA Board participates in determining the operational direction and supervises the implementation of the enterprise's key management system work plans. The MWA Board of Directors considers and approves important operational plans before the beginning of the fiscal year or assigns a subcommittee to consider and approve and present them to the MWA Board of Directors for acknowledgment before the beginning of the fiscal year. This includes monitoring the important management system plans of the enterprise at least quarterly, along with providing observations and suggestions.
- **Enterprise Management Policy Setting:** Set enterprise management policies and supervise the state enterprise to operate in accordance with the law, relevant regulations, and established operational policies.
- **Responding to Public Sector Roles:** Monitor and ensure that the MWA reports its performance in accordance with policies and good governance guidelines to the Ministry of Interior, which is the supervisory ministry, and the Ministry of Finance, which is a systematic and comprehensive shareholder, covering important issues, including reporting financial and non-financial performance, reporting compliance with good governance practices, and reporting compliance with laws, regulations, and rules related to the MWA.
- **Strengthening Good Governance:** Establish a good governance policy and manual and appoint a subcommittee to oversee corporate governance completely and appropriately, with the MWA Board considering and approving long-term good governance plans and action plans before the start of the fiscal year or assigning the subcommittee to consider, approve, and present to the MWA Board for acknowledgment before the start of the fiscal year. This includes monitoring the good corporate governance plan at least quarterly, along with providing observations and suggestions.
- **Ethics:** Supervise the MWA to prepare a comprehensive ethics manual that complies with international standards at the board, executive, and employee levels, and to disseminate it to all levels of personnel for their awareness and implementation.
- **Role Toward Fair Marketing:** Supervise the MWA to develop and implement policies and practices for fair competition systematically and comprehensively.
- **Shareholders' Rights and Equality:** Establish policies and procedures for preventing conflicts of interest, use of inside information, and related transactions, which are part of the code of conduct for the Board of Directors, executives, and employees of the MWA, and in accordance with the principles of good corporate governance.
- **Role Towards Stakeholders:** Supervise and monitor the MWA's development of policies and guidelines for stakeholder management. The MWA Board of Directors considers and approves long-term stakeholder-focused strategic plans and action plans before the start of the fiscal year, or assigns a subcommittee to consider, approve, and present them to the MWA Board of Directors for acknowledgment before the start of the fiscal year, including monitoring of stakeholder-focused strategic plans at least quarterly in addition to providing observations and suggestions.

- **Risk Management and Internal Control:**

Establish guidelines for supervision and monitoring of risk management and internal control operations. The MWA Board of Directors considers and approves risk management and internal control plans before the beginning of the fiscal year or assigns a subcommittee to consider, approve, and present them to the MWA Board of Directors for acknowledgment before the beginning of the fiscal year, including monitoring of the risk management and internal control plans and integrating good corporate governance, risk management, and compliance with relevant laws, rules, regulations, and regulations (GRC), in addition to providing observations and suggestions.

- **Sustainability and Innovation:** Establish a clear and systematic policy and guidelines for innovation management and a policy and guidelines for strategic sustainability development of the MWA. The MWA Board

of Directors approves the long-term and annual innovation management plans before the start of the fiscal year, or assigns a subcommittee to consider, approve, and present them to the MWA Board for acknowledgment before the start of the fiscal year. The Board monitors the implementation of the innovation management plans at least quarterly, provides observations and recommendations, and oversees the MWA's enterprise innovation system that aligns with the enterprise's business direction and operations. The MWA also prepares and disseminates sustainability development reports according to standards for stakeholders' access.

- **Disclosure of Information:** Supervise the MWA to disclose both financial and non-financial information and data through the annual report and the MWA website are as follows:

Information Disclosed in the MWA's Annual Reports	Information Disclosed on the MWA's Website
<p>At least the following:</p> <ol style="list-style-type: none"> 1) Organization structure/shareholder structure 2) History of the MWA's board of directors 3) Background information of executives 4) Financial analysis reports, performance, and significant changes 5) Auditor-certified financial statements 6) Report of the board of director's responsibilities/ the Audit Committee's responsibilities concerning financial statements 7) Key business risks 8) Remuneration policy and pay information of the board of directors 9) Remuneration policy and pay information of high-ranking executives 10) Number of meetings attended by the board of directors and subcommittees by individual directors 11) Good corporate governance activities 12) Corporate social and environmental responsibility activities 13) Policies and performance in the management of connected transactions 14) Nature of business, business plans, and strategies 	<p>At least the following:</p> <ol style="list-style-type: none"> 1) Policy direction of the MWA 2) Good corporate governance policy 3) Activities in line with government policies 4) Important work plans 5) Significant investment information 6) Procurement 7) Important financial and non-financial performance 8) Annual reports

- **Monitoring of Performance:** Monitor financial and non-financial performance at monthly board meetings and provide observations or suggestions to improve efficiency and effectiveness of operations to achieve targets.
- Activities related to the highest-ranking executives, high-ranking executives, and employees:
 - 1) Establishment of the Metropolitan Waterworks Authority (MWA) Governor's Remuneration Committee to evaluate the criteria and methods for recruiting suitably qualified persons to serve as the Governor of the MWA.
 - 2) Supervise and ensure that the MWA has a suitable structure for high-ranking executives, work scope, and qualifications for high-ranking executives.
 - 3) Assess the performance of the Governor and high-ranking executives with clearly specified criteria, indicators, weights,

and goals from the start of each year and performance evaluation taking place every 6 months, and connect evaluation results with an incentive system.

- 4) Ensure the existence of a succession plan for high-ranking executives and key positions of the MWA.
 - 5) Encourage and support Management and employees to receive training and development to gain useful work knowledge and experience.
 - 6) Supervise to ensure that the Governor manages human resources consistently with the missions and objectives of the state enterprise while retaining competent state enterprise employees.
- Appointment of the board of directors and subcommittees to ensure oversight and review of matters before submission to the MWA Board.

Performance Assessment and Skill and Knowledge Development^(2-17, 2-18)

The MWA requires an assessment to be conducted on the MWA's board of directors once per year in line with the good corporate governance principles for the state enterprise, by which a performance evaluation of the entire board of directors of the state enterprise and individual directors has to take place at least once annually every year to allow the board of directors to review work performance and issues and obstacles encountered in the past year and to enhance the board of director's work performance. In the 2024 fiscal year, the MWA's board of directors completed

evaluation forms and approved 3 types of evaluation forms as follows: the director's self-assessment form, the board evaluation form, and the MWA director's cross-evaluation form. After completing the evaluations, the evaluation results were brought together for mutual consideration in order to seek ways to improve the different work activities of the board of directors and create plans to enhance the corporate governance effectiveness of the MWA's board of directors in the 2025 fiscal year to improve performance effectiveness.



Board Performance Evaluation Results for the 2024 Fiscal Year

- 1. Individual MWA Director Self-Evaluation:** The mean evaluation score was 4.81 points out of 5 points total or 96.24 percent. This means that, on average, the work performance of the individual directors of the MWA was excellent.
- 2. MWA Board Performance Evaluation:** The mean evaluation score was 4.80 out of 5 points total or 96.10 percent. This means that, on average, the work performance of the entire MWA board was excellent.
- 3. Cross-Evaluation of MWA Directors:** The mean evaluation score was 4.92 out of 5 points total or 98.38 percent. This means that, on average, the work effectiveness of the MWA's individual board members as evaluated by other directors was excellent.

Accordingly, the MWA Board's plan to enhance corporate governance effectiveness in fiscal year 2024 requires monitoring and acknowledging the performance of risk management/internal control and internal auditing every quarter, as well as monitoring situations affecting the MWA's operations, and providing solutions whenever situations arise that affect operations or cause performance to not meet targets. In addition, the MWA considers the key missions of the board and the framework for evaluating the performance of the state enterprise in the areas of good governance and organizational leadership, based on the enterprise's evaluation criteria, along with issues involving evaluation scores that fall below the overall average score, and make recommendations based on evaluation results, using analysis to develop plans to increase the effectiveness of the MWA Board's governance in fiscal year 2025.

The MWA has a policy to encourage the development of its board members by increasing their knowledge and experience through training/seminars in relevant courses to promote the performance of duties beneficial to the supervision of the MWA's strategic operations concretely and continuously. This includes the "Director Accreditation Program" (DAP) organized by the Thai Institute of Directors (IOD), the Corporate Governance Course for Directors and Senior Executives of Regulators Organizations by the King Prajadhipok's

Institute, along with other appropriate courses, not to mention work studies related to water management systems and other related systems, including sustainable development. Among such work studies were tours to study water management systems and other related systems in the Kingdom of Sweden and the Kingdom of Denmark, where water is transported from lakes and then treated to a high quality before distribution, and visits were also made to learning centers and information centers focusing on energy and water management (HOFOR) that promote sustainability and environmental protection. In addition, various subcommittees appointed by the MWA Board have undertaken study tours under their respective responsibilities. For example, the Corporate Governance Subcommittee (CG) and Corporate Social Responsibility Subcommittee (CSR) have undertaken a study tour and attended a presentation on the Royal Initiative Large-Scale Groundwater Procurement Project to Alleviate Drought in Huai Krachao Sub-district, Huai Krachao District, Kanchanaburi Province, and the MWA has been able to use information from this project to address water shortages and droughts, in addition to applying it to the MWA's raw water sources. The MWA also conducted a study visit to the "Legacy Circular Economy Learning Center" at The Legacy River Kwai Resort, a business that has adopted the zero food waste concept to address food waste. This involves managing food waste and turning it into fertilizer, transforming it into a renewable resource. In addition to the study visits, the MWA Board also visited agencies in their actual places of operation.

In addition, newly appointed directors are provided with an orientation program, which includes a briefing on the overall operations of the MWA, along with a director's handbook and other important organizational documents, including essential information, to ensure maximum efficiency and effectiveness in performing their duties as directors.



Compensation for MWA's Committee⁽²⁻¹⁹⁾

Compensation of MWA's Committee are categorized into three types:

1. Monthly compensation



2. Meeting attendance fee



3. Annual bonus



As a state enterprise under the supervision of the Ministry of Interior, the Committee holds the right to receive compensation according to criteria approved by the Cabinet. Compensation is paid during the period that the Committee members are still in term of office, if in the case of retirement/out of office, no compensation is paid to those Committee's members. However, each Committee's member holds the right to receive a compensation of not more than 10,000 baht per month, paid in proportion to the length of their tenure. The Chairman of the Board holds the right to

receive compensation twice the amount of monthly compensation paid to each member of the Committee or 20,000 baht per month.

The payment of meeting allowance for the Committee's members is in accordance with the criteria for payment of monthly compensation and meeting allowance for State Enterprise Committee and other Committee's members in Subcommittees, Subcommittees, or other working groups in accordance with the Cabinet resolution dated 24 April 2019. The Committee's member holds the right to receive a meeting allowance of not more than 20,000 baht per month, and the Chairman of the meeting holds the right to receive at a rate of 25 percent of the meeting allowance paid to each member of the Committee as a surplus.

- 1) In the case of MWA's Committee meetings, the meeting allowance is paid once a month. In this regard, it shall consider paying more than once per month, but not more than fifteen times per year, when it is reasonable.
- 2) In case of a specific Subcommittee meeting, other Committee members or working groups who are appointed by law or regulations which are the central criterion, or the Cabinet resolution, the State Enterprise Board, MWA's Committee members, and other Committee members who attend the meeting and are not the member of MWA's Committee, hold the right to receive an equal meeting allowance at the rate of 0.5 times of the amount paid to the MWA Committee members. But it is not more than two different Committees, and each Committee is paid only once a month.

MWA is required to pay bonuses to Committee members after submitting the net profits allocated as state revenues to the Ministry of Finance. The bonus allocation is according to the evaluation results and the limit under the criteria approved by the Cabinet resolution dated 2 July 2013, which has approved the improvement of the incentive program in the monetary compensation in accordance with the state enterprise performance evaluation system, according to the meeting resolution of the State Enterprise Policy Committee Meeting No. 4/2013, dated 17 June 2013.

Anti-Corruption

The Metropolitan Waterworks Authority (MWA) is committed to managing work while adhering to its good governance mission in line with good governance principles with emphasis on becoming a transparent enterprise that combats corruption while having in place ethical and moral standards with consideration to every group of stakeholders. In doing so, we have

specified policies and practice guidelines for promoting morals and ethics and created an MWA Anti-Corruption and Misconduct Plan and reported performance according to the plan to the Anti-Corruption Command Center, Ministry of Interior (ACCC, MI) according to set timeframes.

Anti-Corruption Policy

The MWA has set in place guidelines and measures according to the National Strategy on Anti-Corruption and Anti-Corruption Action Plans in State Enterprises (2023-2027) for use as our operating framework by promoting participation in monitoring and instilling conscience and promoting understanding about anti-corruption in addition to reporting wrongdoings to prevent corruption to duties. Furthermore, in cases where corruption is discovered, investigations are conducted to prosecute and administer disciplinary punishments to create examples to deter others.

In 2024, the MWA published a report on the ethical acceptance of assets or other benefits for agencies in accordance with Section 128 of the Organic Act on Prevention and Suppression of Corruption B.E. 2561 (2018). A campaign was also held to encourage personnel to refrain from giving or receiving gifts and



presents of any kind while, before or after performing their duties that could lead to corruption and misconduct (No Gift Policy).

Declaration of Intention

The MWA is committed to operating in a transparent, verifiable, and effective manner without corruption. In doing so, we sign in a declaration of the intention of the MWA's board of directors, executives, and employees every year to demonstrate our commitment and obligation to perform our duties with honesty, integrity, transparency, and governance according to

the principles of good governance with the intention to achieve work effectiveness and efficiency to drive the MWA's work toward sustainable growth while building confidence among stakeholders about our transparent work operations, which will lead us to become a quality organization.



Conflict-of-Interest Prevention Policy and Guideline

The MWA gives importance to conflict-of-interest prevention and has issued the Board of Directors of the Metropolitan Waterworks Authority's Announcement on the Policies and Guidelines for Prevention of Conflicts of Interest, Use of Internal Information, and Connected Transactions and issued orders, criteria, and work procedures about reporting of conflicts of interest, use of internal information, and connected transactions in order to have the board of directors, Governor, executives, and employees along with other contract workers such as subcommittees, directors, consultants, and work committees established by the board of directors of the MWA that are not members of the board of directors of the MWA, the Governor or employees of the MWA to use as clear criteria and

practice guidelines in order to raise awareness about conflict-of-interest prevention, which is the duty and responsibility that everyone must understand and practice. Moreover, we have instructed the Internal Audit Office to summarize reports on conflicts of interest, use of internal information, and connected transactions that take place throughout the year to report to the Governor in order to present to the board of directors of the MWA.

In the 2024 fiscal year, the MWA's contract workers, including the board of directors of the MWA (including the Governor), the MWA's employees, and other contract workers, **numbered 4,095 people who had no conflicts of interest.**

Assessment of the Risk of Corruption within the Enterprise and Criteria Used⁽²⁰⁵⁻¹⁾

The MWA prepares a corruption risk management plan annually. In fiscal year 2024, the following actions were taken:

- 1. The MWA participated in a seminar to drive policy-based corruption risk assessment in the implementation of large-scale projects in fiscal year 2024 according to the project to drive the Corruption Perception Index score of Thailand towards strategic goals, organized by the Office of the Public Sector Anti-Corruption Commission (PACC).
- 2. The MWA created a plan to manage the risk of corruption within the enterprise. In the fiscal year 2023, the Office of the Public Sector Anti-Corruption Commission (PACC) required state enterprise to assess the risk of corruption for 1 procurement project with the highest budget. Accordingly, the MWA selected the procurement project with the highest budget, as shown below.



Construction project for a clear water storage tank sized 80,000 cubic meters at Bang Phli Water Distribution Pumping Station, Contract G-BP-9 along with related works.

- The information reported was as follows:
- 1. Agency corruption risk report form
 - 2. Corruption risk issues report form
 - 3. Corruption management risk report form
 - 4. Project procurement estimate report form.

3-Step Corruption Risk Assessment Method



These were an analysis of corruption risk factors according to the Fraud Triangle theory, namely as follows:

- Pressure/incentive to act.
- Opportunity arising from vulnerabilities in various systems, quality of governance, and weaknesses in the internal control of the enterprise.
- Rationalization to support actions.

The risk assessment of the aforementioned project found no complaints about risk of corruption through the Anti-Corruption Command Center of the Metropolitan Waterworks Authority (MWA ACCC), since the MWA has measures in place to control corruption risks and ensures to cover every process in addition to carrying out procurement correctly. The MWA has also added a system for monitoring work via a dashboard to enable executives to understand each work operation according to set timeframes.

3. We reported performance according to the enterprise corruption risk management plan to the ACCC, MI to submit to the Office of Public Sector Anti-Corruption Commission.

In addition, in 2024, the MWA conducted a corruption risk assessment on issues related to bribery in operations or duties according to the agency's mission, including the following:

- (1) Approval and authorization under the Facilitation of Government Permission Consideration Act, B.E. 2558 (2015), on "Prevention of Bribery in the Issuance of Certificates of Blueprints for the Construction of Private Waterworks Systems".

Enterprise Corruption Risk Management Plan for Fiscal Years 2018-2024

- 2018 - Water connection requests.
- 2019 - Supplies requisitioning process (equipment/pipe requisitioning).
- 2020 - Meter and equipment replacements in the meter and equipment requisitioning process.
- 2021 - Construction supervision.
- 2022 - Mahasawat Water Treatment Plant Capacity Expansion Construction Project to a size of 800,000 and related works in contract GE-MS5/6-9.
- 2023 - Lat Krabang Water Distribution Pumping Station 2, Clear Water Reservoir with 502,000 Cubic Meter Capacity and related works construction project in contract GES-LK-9.
- 2024 - Clear Water Reservoir with 80,000 Cubic Meter Capacity Construction Project at Bang Phli Distribution Pumping Station in Contract G-BP-9.

- (2) Use of legal authority/services according to the mission on "Preventing Bribery from the Rent of Equipment for Construction or Repair of Water Pipes".
- (3) Procurement on "Preventing Bribery in the Construction of the Clear Water Storage Tank Sized 80,000 Cubic Meters".
- (4) Human resource management on "Preventing the Use of Discretion in Considering Promotions and Transfers of Employees".

Communication and Education on Anti-Corruption⁽²⁰⁵⁻²⁾

The MWA provides publications to its board members, executives, employees, and stakeholders to create awareness and promote morality, ethics, and anti-corruption, including interviews, training, production of various forms of public relations media, and integration of participation in activities with agencies, for acknowledgment as follows:

(1) Training in knowledge of good governance, ethics and code of conduct, and anti-corruption

- The MWA Board organized a training course on ethical standards for members of the 4th MWA Governance Council, new employees and MWA staff.
- The MWA Board organized an online training course on “Case Studies of Corruption in the Performance of Duties” via Google Meet.
- The MWA Board organized a training project to raise ITA assessment scores for fiscal year 2024 to remind MWA personnel to adhere to the No Gift Policy.
- The MWA Board participated in the 4th workshop on developing the potential of STRONG coaches for a sufficiency organization against corruption, organized by the Office of the National Anti-Corruption Commission (NACC).
- The MWA Board participated in the Dharma lecture activity to promote morality and ethics at the Office of the Permanent Secretary, Ministry of Interior, in fiscal year 2024, under the motto “The Ministry of Interior is guided by Dharma”.
- The MWA Board participated in the exchange of knowledge on best practices in operations according to the action plan against corruption and misconduct in state enterprises (2023-2027).

(2) Preparation and dissemination of public relations media through various communication channels, such as circular letters, intranet, Internet, Facebook: MWA CG Club

- The MWA Board created a poster on the promotion of ethics and code of conduct

for the Board of Directors, the Governor, and deputy governors.

- The MWA Board members conveyed their ideas to stakeholders on “driving ethics and code of conduct in the enterprise and being a good role model” in the workshop to critique and review the results of the 6th MWA Enterprise Plan.
- The MWA Board created an infographic on the criteria for receiving property or other benefits ethically by government officials.
- The MWA Board created a video clip on good practices according to the MWA’s Code of Ethics and Code of Conduct.
- The Deputy Governor (Administration) communicated about the 7 points of ethical standards according to the regulations of the MWA.
- The MWA Board reviewed the Code of Ethics and Code of Conduct for the operations of the MWA.
- The MWA Board created an infographic on the dos and don’ts according to the MWA’s Code of Ethics.
- The MWA Board created a video clip on the principles of good governance of the MWA and participated in a quiz activity to measure understanding.
- The MWA Board created a video clip and played games and answered questions to test knowledge and understanding about ethics and the Code of Conduct.
- The MWA Board communicated good governance knowledge on the “5 indicators of ethics and conflicts of interest” and invited MWA personnel to participate in activities to share good ideas about living.
- The MWA Board created an infographic with moral teachings for #HappyFriday.
- An MWA poster won first place in the ITA AWARDS 2024 for state enterprises under the Ministry of Interior with a score of 98.84 or “Excellent Pass”.

(3) Projects/activities to create a good environment

- MWA personnel signed to acknowledge the MWA's good corporate governance manual.
- MWA Board of Directors, executives, and employees signed a declaration of intent: "Transparent, Accountable, Corruption-Free, and Efficient MWA" for fiscal year 2024.
- MWA personnel were invited to participate in the "150 Word Short Story" on promoting ethics and preventing corruption within the enterprise.
- The Governor of the MWA presented a certificate of honor under the "Record of Good Deeds" project. (to praise personnel who do good work)
- The MWA participated in the Integrity and Transparency Assessment (ITA) of government agencies.
- MWA personnel participated in a study of the Sutta Pitaka through chanting as part of the "Developing the Mind to Improve Quality of Life and Work Effectiveness" project.
- The MWA reviewed the Code of Ethics of departmental agencies.
- Members of the MWA Governance Council communicated information on governance, ethics, and the Code of Conduct to agency personnel.
- The MWA organized the annual Good Governance Council Day 2023 to promote good behavior and communicate the issue of "moral touchables".
- The Chairman of the Council participated in the 1st Sustainable Moral Leadership Community Development Project, together with executives and leaders of change from 5 social networks.
- The MWA participated in an activity to exchange best practices to promote corporate governance among state enterprise contract parties.
- The MWA held the 1st "Youth Water Guardians" activity to raise awareness of 5 moral indicators through a moral knight's base for protecting the environment.
- The MWA Governance Council participated in the "MWA Meets the People" activity.

MWA Anti-Corruption Operations Center (MWA AOC)

The MWA has established the MWA Anti-Corruption Operations Center (MWA AOC) with two areas of authority: 1) promoting ethics and good conduct; and 2) anti-corruption operations. The MWA AOC has channels for reporting complaints about corruption and misconduct by MWA personnel. If any person witnesses any corruption or misconduct, it is possible to file a complaint under the Whistle Blowing Policy, which will protect the whistleblowers' information and keep their personal information confidential. This is to build confidence in whistleblowers that they will not face repercussions. Complaints can be filed through the MWA's complaint channels or through the Damrongtham Center, with eight channels in total, as follows:



1. Secretary of the MWA Anti-Corruption Operations Center, Suthi Uthakakon Building, 8th Floor, MWA Head Office, No. 400 Pracha Chuen Road, Thung Song Hong Sub-district, Lak Si District, Bangkok 10210, Telephone: 0 2500 2518 or 0 2504 0123 ext. 2518.
2. Justice Box (Complaint Box) at the Information Center, Suthi Tharakon Building, 1st Floor, MWA Head Office, No. 400 Pracha Chuen Road, Thung Song Hong Sub-district, Lak Si District, Bangkok.
3. E-mail: anticor@mwa.co.th.
4. Internet: Click the link under the heading "MWA Services," and select the "MWA Anti-Corruption Operations Center" and then go to the banner "Complaints" and the banner "Report Corruption and Misconduct (MWA Anti-Corruption Operations Center)".
5. Intranet: Complainants can click on the banner "Complaint Handling" on the main page <http://intra.mwa.co.th> or "<http://intra.mwa.co.th>" or http://intra.mwa.co.th/m_complain.php to access the complaint screen.

Overview of Anti-Corruption Performance for Fiscal Year 2024^(205-2, 205-3)

Item	Unit	Total
Total Number of Departments in the Organization	Department	66
Number of Departments Assessed for Corruption Risk	Department	4
Percentage of Departments Assessed for Corruption Risk	Percent	6.06
The Board of Directors (BOD), Executives, and Employees of the MWA Who Received Training in the Anti-Corruption Policy and Processes		
Members of the MWA's Board of Directors	People	15
Members of the MWA's Board of Directors who received training	People	15
Percentage of members of the MWA's Board of Directors who received training	Percent	100
Number of Executives (section supervisor or equivalent and above)	People	1,494
Number of Executives (section supervisor or equivalent and above) who received training (6-10)	People	765
Percentage of Executives who received training	Percent	51.20
Number of employees (excluding contract workers)	People	2,565
Number of employees who received training (excluding contract workers) (1-5)	People	1,446
Percentage of employees who received training	Percent	56.37
The Board of Directors (BOD), Executives, Employees, and Trade Partners of the MWA Who Received Communication Media in the Anti-Corruption Policy and Processes		
Number of members of the MWA's Board of Directors who received communication	People	15
Percentage of members of the MWA's Board of Directors who received communication	Percent	100
Number of Executives (section supervisor or equivalent and above) who received communication	People	1,494
Percentage of Executives (section supervisor or equivalent and above) who received communication	Percent	100
Number of employees (excluding contract workers) who received communication	People	2,565
Percentage of employees who received communication	Percent	100
Number of trade partners (suppliers and contractors) ^a	People	52 ^a
Number of trade partners (suppliers and contractors) who received communication	People	52 ^b
Percentage of trade partners (suppliers and contractors) who received communication	Percent	100
Corruption Incidents (If any by employees and trade partners) ⁽²⁰⁵⁻³⁾	case	0
No. of Legal Cases Related to Corruption in the Enterprise or Employees during the Reporting Cycle ⁽²⁰⁵⁻³⁾	case	0

a. Trade partners who made contracts with the MWA valuing five hundred thousand baht and up for 3 consecutive years.

b. In fiscal year 2024, guidelines for operations were communicated with transparency through the procurement process by MWA personnel responsible for procurement, as well as those appointed as procurement officers, in accordance with the organization's ethics and code of conduct.

Survey Results on Perceived Governance and Transparency by Stakeholders (5 points total)

Fiscal Year	Policy Agencies	Mission-based Agencies	Media	Community and Society	Trade Partners	Allies	Activists	Customers	Employees and Contract Workers	Total Average
2022	4.63	3.60	3.69	4.11	4.05	4.22	2.63	3.05	3.85	3.76
2023	4.33	4.18	4.42	4.20	5.00	4.40	4.02	3.67	4.12	4.26
2024	4.13	4.09	4.73	4.92	4.93	4.23		4.06	4.41	4.44

MWA Official Information Center

The MWA’s Official Information Center is located on the 1st floor of the MWA headquarters building. Established in 2019 to comply with the Official Information Act, B.E. 2540 (1997), the enterprise aims to provide citizens with access to information about government operations, show them that government operations are transparent, and allow them to inspect or study information. They can also access the information center via the MWA website: www.mwa.co.th or on the website www.oic.go.th with 24/7 availability.

The MWA is committed to operating in accordance with good governance principles. This has led the MWA’s Official Information Center to adopt these guidelines as a core service for the public with focus on providing transparent information. As a result, the MWA has won the Outstanding Official Information Center Award for six consecutive years (2019-2024). This reflects its commitment to operating in accordance



with the Official Information Act, B.E. 2540 (1997), with transparency, fairness, and complete disclosure of useful information to the public, promoting genuine participation in accordance with good governance principles.

Effective Communication

The MWA is a state-owned enterprise that plays a crucial role in providing quality and excellent water services to citizens in Bangkok, Nonthaburi, and Samut Prakan provinces. Effective communication is therefore a key factor in driving the enterprise's mission efficiently while meeting the needs and expectations of its stakeholders. The MWA has developed a public relations plan to communicate with both internal and external stakeholders, including public relations

communications regarding our quality waterworks system, public relations communication regarding service excellence, public relations communication regarding sustainable management under the concept of "Quality Water for Quality Living", and public relations communication regarding mission-based tasks through various channels and projects/activities of the enterprise.

Survey Results on Stakeholder Perception and Confidence in the MWA

MWA's stakeholders' level of information awareness (full score: 5)

Fiscal Year 2022



Fiscal Year 2023



Fiscal Year 2024



MWA's stakeholder confidence level (full score: 5)

Fiscal Year 2022



Fiscal Year 2023



Fiscal Year 2024



Promoting Stakeholder Engagement in Enterprise Operations

Promoting stakeholder engagement in the enterprise's operations is a communication process that helps the MWA develop quality services and effectively respond to the needs of the people, in addition to providing opportunities for all parties to participate, not only to build good relationships, but also to help enhance transparency in operations.

The MWA holds an annual **Enterprise Plan Critique Meeting** to review and develop the enterprise's operational plans. This process presents the MWA's various plans to all stakeholders and provides a stage for stakeholders to learn about operational plans and an opportunity to listen to their opinions, exchange suggestions, and consider plan revisions to ensure

they align with the enterprise's goals and stakeholder expectations in an effective and sustainable manner.

Additionally, the **MWA Meets the People Project** is implemented by all 16 MWA branch offices annually with the aim of proactively building and enhancing relationships with residential consumers and local communities. The project also promotes MWA news and information on waterworks systems and tap water to the public and also gathers the needs and expectations of target consumers to improve service plans. In the fiscal year 2024, the MWA branch offices conducted four such activities, achieving a residential consumer satisfaction score of 4.84 and a community consumer satisfaction score of 4.89 (out of 5 total).

Complaint Management

The MWA does more than reviewing and drawing up the enterprise's public relations communication plans annually to improve and develop communications to respond to changing situations in terms of user needs, technology development, emergency management, and strategies to align with various policies.

Specifically, the MWA has guidelines for accepting suggestions/comments on water supply services and other related services by establishing a **complaint management policy** and creating an enterprise **complaint management manual**, which covers

the management of complaints received from consumers and stakeholders affected by the MWA's product (water) and services, such as tap water quality, water pressure/volume, pipe laying/repair works, personnel services, water bills, etc. The complaint management process begins with the receipt of the complaint, followed by situation consideration to lead to corrective actions until a solution is reached, with follow-up evaluations, data collection, summary, and analysis to inform executives and related parties for service improvement and development.

Complaint Channels Regarding the MWA's Products and Services:

- **Telephone:** 1125 hotline and telephone calls to all MWA branch offices
- **Online channels:**
 - MWA onMobile application
 - Social Media: Facebook, X
 - LINE OA: @MWAThailand
 - The official website of the MWA (www.mwa.co.th)
 - MWA eService
 - E-mail: mwa1125@mwa.co.th
 - Web chat
- **Office contact channels:** 18 MWA branch offices and 4 mall service centers
- **Mail:** Address to the Metropolitan Waterworks Authority at 400 Prachachuen Road, Thung Song Hong Sub-district, Lak Si District, Bangkok 10210
- **Other channels** such as the Government Contact Center for the People (GCC 1111) and the Damrongtham Center, Ministry of Interior



We have also announced the criteria, measures, and guidelines for handling complaints in the case of corruption and misconduct by MWA officials and have established the **Metropolitan Waterworks Authority Anti-Corruption Operations Center (MWAAC)** as a channel for stakeholders to report corruption. Furthermore, we have measures to provide protection to whistleblowers who provide information to the MWA by having

announced the MWA Whistleblowing Policy as a guideline for reporting corruption and protecting whistleblowers. Accordingly, the MWAAC will forward such matters to the relevant agencies for legal action according to the law and the requirements, regulations, criteria, and procedures of the MWA. In the fiscal year 2024, no complaints regarding corruption were encountered through the MWAAC.



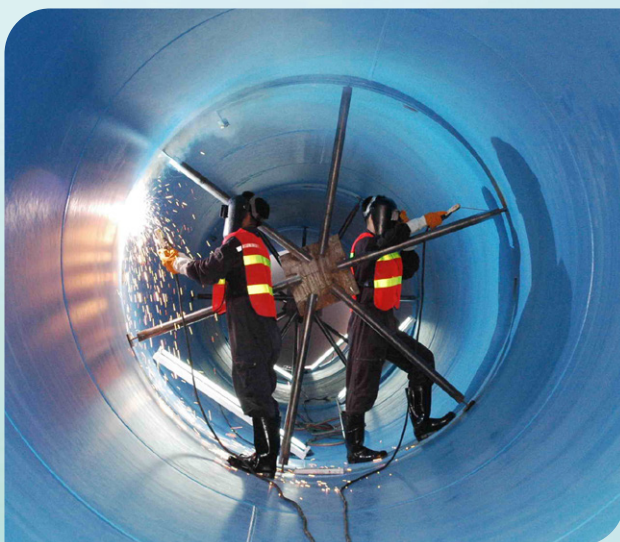
Business Continuity Management

The MWA recognizes the significance and is aware of the fact that business operations today are at risk of disruption due to various situations caused by either human activity or natural disasters, such as floods, earthquakes, fires, sabotage, etc. Furthermore, in order to ensure that the MWA's operations achieve their objectives in continuously supplying tap water to consumers and effectively deal with crises, reduce stakeholder impacts and effectively boost confidence in the enterprise, we have created and maintain a **business continuity management system (BCMS)** to prepare for dealing with situations, setting strategies and creating guidelines for actions upon facing business disruptions, along with a manual that serves as a guideline for development and a tool for helping ensure that the BCMS system conforms to specifications and can be developed effectively.

The MWA has established a **business continuity policy** for the MWA Governor, executives, employees, and contractors to use as an operating guideline and has appointed the Business Continuity Management

System Committee (BCMS Committee) to supervise, control, monitor and promote operations according to the policy and established work plans, with the Business Continuity Management System Working Team (BCMS Working Team), and supporting work committees helping to drive implementation and operations effectively according to business continuity management system standards.

In the fiscal year 2024, the MWA was able to maintain its BCMS system according to the ISO 22301:2019 standard, with its scope covering raw water management, tap water treatment, transmission-distribution pumping, MWA branch office services (supplying water to consumers), and activities of support agencies, covering from raw water systems to supplying water to consumers within the service area of the MWA. In addition, emergency response plans and the business continuity plan were rehearsed to boost confidence in stakeholders that we can continuously produce high-quality tap water for consumers even if the enterprise faces crises in the future.



Action Plans for the Fiscal Year 2024 Under the 6th MWA Enterprise Plan (2023-2027), 2023 Revised Edition, to Support Continuous Tap Water Services to Consumers in the Service Area

- Project to manage the raw water transmission system on the eastern side.
- Project to develop water control buildings along water canals on the eastern side.
- Project to procure space for holding raw water reserves.
- Project to urgently renovate the treatment, transmission pumping and distribution pumping systems within 3 years.
- Project to construct the Mahasawat Water Treatment Plant (under the 9th MWA Master Plan Improvement Project).

Innovation and Digitalization

MWA Innovation Promotion Guidelines

The Metropolitan Waterworks Authority (MWA) reviews the enterprise's operational direction to align with the current situation every year. In 2024, the MWA Board of Directors and senior executives placed importance on environmental conservation in

line with the BCG Model while emphasizing energy reduction and the use of renewable energy, including the establishment of guidelines for research, development, and innovation (Innovation Theme).

MWA Innovation Promotion

The Metropolitan Waterworks Authority (MWA) promotes innovation through a policy to encourage creativity and innovation management, along with the Research, Development, and Innovation Master Plan (long-term plan) and action plans under the master plan (annual plans) as well as operational goals that are clearly set each year.



Creativity Promotion and Innovation Management Policy

- The MWA's Board of Directors gave the Creativity Promotion and Innovation Management Policy to executives and employees for implementation.

Research, Development, and Innovation Master Plan (2023-2027)

- Support the MWA's 6th Enterprise Plan (2023-2027) by enhancing enterprise capabilities through knowledge and innovation.
- Vision: "Building upon knowledge and innovating for sustainability" through 2 strategic objectives:
 1. Become an efficient enterprise through innovation management.
 2. Enhance enterprise capabilities through innovation.

Action Plan under the Research, Development, and Innovation Master Plan, 2024

- Emphasize performance and drive for use of innovation as an essential tool for creating added value for products, services, and work processes to strategically support the enterprise and generate revenues for the enterprise through innovation to have the MWA become a sustainable innovation-driven organization by fiscal year 2027.

Innovation Goals in 2024

- Revenue-generating Innovations

The MWA's Creativity Promotion and Innovation Management Policy has the objective of enabling the MWA to systematically and sustainably develop innovations, adapt to crises, and increase efficiency and competitiveness. This can be summarized as follows:

1. Effective management of innovation systems (MWAIS) to support creativity and innovation development.
2. Support for the use of digital technology, IOT, and big data to improve services and water loss management.
3. Promotion of research and development in energy conservation, renewable energy, and the use of technology according to the BCG model.
4. Promotion of a culture of knowledge exchange and stimulation of creativity.
5. Enhancing innovation capabilities in personnel to create new products, work processes or new business models.
6. All executives and employees have a duty to support and comply with this policy.

The MWA has created the Research, Development, and Innovation Master Plan (2023-2027). It is a long-term plan to support the 6th MWA Enterprise Plan, which aims to enhance the enterprise's capabilities through knowledge and innovation. Furthermore, we also created a short-term action plan under the research master plan for the fiscal year, and to ensure that the MWA can adapt quickly to crises, maintain efficiency, and maintain competitiveness, the Research, Development, and Innovation Master Plan and the action plan under the research master plan are reviewed annually, along with their yearly targets.

To ensure that research, development, and innovation meet the enterprise's needs, the MWA has specified the innovation themes to be used in various innovation activities, such as providing research funding support for MWA employees and educational institutions, projects, corporate innovation competitions for the fiscal year, the One Department, One Innovation or One Process Project for the fiscal year, etc. The MWA's innovation themes consist of 6 themes in total, and the BCG model, or the economic growth approach for sustainable quality, is also included among them.

Innovation Theme 2024

Business Redesign

- Develop new business and service models.
- Improve enterprise regulations and internal processes for efficiency.
- Reduce operating costs and expenses.
- Generate revenue for the enterprise.

Data-driven Organization

- Data-driven enterprise management by use of big data in analysis/processing for presentation/operational decision-making.
- Technological and digital developments according to goals set in line with the Enterprise Architecture (EA).

Smart Water System

- Enhance water treatment efficiency.
- Reduce water loss.
- Effective tap water quality control.
- Manage water pressure.
- Safe water supply planning.



Resilient Water Supply

- Sustainable water resource management.
- Capability in predicting and responding to changes.

Seamless Service Experience

- Enhance consumer satisfaction.
- Reduce complaints.
- Enhance services through technology and strive toward establishing a virtual branch.

BCG Model

- Worthwhile use of resources.
- Energy conservation technology.
- CO₂ emission reduction.
- Resource recycling.

The action plan under the Research, Development, and Innovation Master Plan for fiscal year 2024 consists of 2 strategic objectives, 4 strategies, and 9 projects as follows:

Strategic Objective 1: IMO1 is an effective organization through innovation management, consisting of the following projects:

Strategy 1 IM01-T1 Enterprise Leadership and Strategy Formulation

Project Code/Name	Number	KPIs	Counting Unit	Target	Performance
IM01-T1- P1 Project to strengthen the role of innovation executives	1.	Level of personnel awareness of innovation information	points	4.2	4.36
	2.	Number of innovation communications of the Governor and Deputy Governor according to the corporate communication plan per year (Leading)	times/year	4	4
IM01-T1- P2 Innovation Roadmap & Innovation Portfolio Development Project	3.	Percentage of success of project activities in each year	percentage	100	100
	4.	Percentage of success in preparing/ reviewing the Innovation Roadmap & Innovation Portfolio (Leading)	percentage	100	100
	5.	Number of times of monitoring and controlling the implementation of the innovation development plan (Leading)	times	4	4

Strategy 1 IM01-T2 Building an Innovation Culture and Personnel

Project Code/Name	Number	KPIs	Counting Unit	Target	Performance
IM01-T2-P1 Innovation Environment Improvement Project	6.	Personnel satisfaction level with innovation environment	score	4.20	4.21
	7.	Percentage of success of project activities in each year (Leading)	percentage	100	100
IM01-T2-P2 Innovation in Process Project	8.	Number of works that create added value from the project	works	9	9
	9.	Percentage of department level agencies that submitted work to participate in the project (Leading)	percentage	100	100
IM01-T2-P3 Enterprise Innovation Awards Project	10.	Number of innovative works resulting from cross-sector collaboration	works	3	3
	11.	Percentage of satisfaction of personnel participating in the project (Leading)	percentage	80	85.09
IM01-T2-P4 Personnel Knowledge and Innovation Enhancement Planning Project	12.	Percentage of personnel who received training according to the enhancement plan and evaluation results that passed the criteria expected by the enterprise.	percentage	80	100
	13.	Percentage of success of operations according to the annual enhancement plan (Leading)	percentage	100	100

Strategic Objective 2: IM02 Enhance enterprise capabilities through innovation, consisting of the following projects:

Strategy 1 IM02-T1 Developing innovations to respond to operational goals and changing situations

Project Code/Name	Number	KPIs	Counting Unit	Target	Performance
IM02-T1-P1 Process Innovation Development Project	14.	Number of process innovations (prototypes) that passed into the scale up innovation stage	number	5	6
	15.	Percentage of personnel satisfaction from using process innovation	percentage	80	86.12
	16.	Number of process innovations (prototypes) resulting from knowledge management (Leading)	quantity	18	23
IM02-T1-P2 Customer Innovation Development Project (VOC to Innovation)	17.	Percentage of customer satisfaction from using innovations	percentage	80	93.46
	18.	Number of innovations resulting from VOC (Leading) analysis	number	4	5

Strategy 2 IM02-T2 Creating added commercial value through innovation

Project Code/Name	Number	KPIs	Counting Unit	Target	Performance
IM02-T2-P1 Commercial Innovation Project	19.	The number of innovations that can be practically applied in the enterprise/ further developed into commercial businesses	number	4	4
	20.	Number of intellectual property applications filed	quantity	1	2
	21.	Percentage of success of project activities in each year (Leading)	percentage	100	100

Each project will be indicated by project objectives, an implementation period, steps or activities, indicators, and strategic target values. The leading KPIs/leading KPI targets of the projects will be specified each year to monitor the projects to ensure that they meet their objectives and targets. In addition, the project risk levels are assessed, along with project trigger points, the names of the agencies in charge of the projects and the budgets each year, as well as consistency with the enterprise plan and other connected master plans. At the end of the projects each year, an assessment of the projects is conducted by

evaluating the lagging KPIs/lagging KPI targets to determine project success.

From the project implementation plan for fiscal year 2024, it appears that the MWA has achieved the performance indicators and objectives for all projects, enabling MWA operations to be in line with the MWA's 6th Enterprise Plan. Specifically, we were able to enhance competitiveness through knowledge and innovation while building toward the enterprise's financial stability.

MWA's Innovative Works in Fiscal Year 2024 that Support Internal Processes

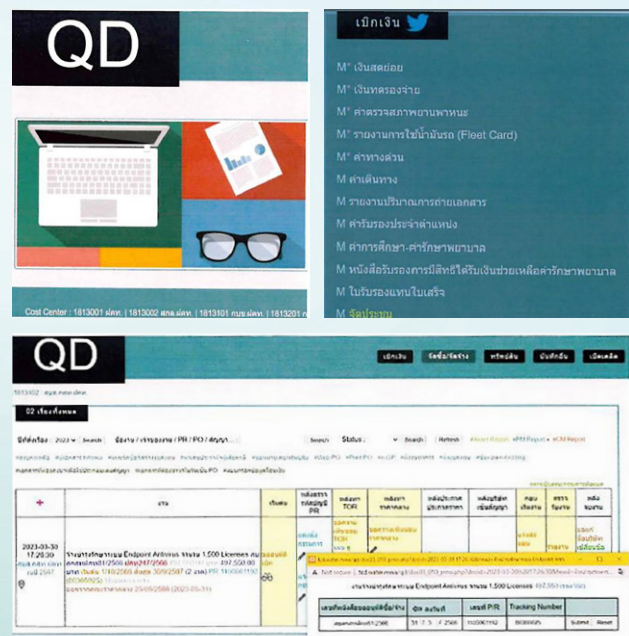
The Process Innovation Project is a project under the Action Plan under the Research, Development, and Innovation Master Plan. It has a total implementation period of 5 years (2023-2027). This project aims to increase the efficiency of work processes through innovation and has resulted in indicators achieving their targets or outperforming competitors/counterparts, with a tendency for continuous performance improvement. The project also improves/develops work processes by creating an organizational architecture, which supports the MWA's 6th Enterprise Plan on increasing enterprise capabilities through innovation.

The steps in implementing this project consist of 7 activities: 1) analysis of internal/external factors and past performance results; 2) determination of important enterprise indicators; 3) review/search for peers in the same industry to determine operational guidelines; 4) development of innovations from knowledge through the agency's operations or by providing funding support to external agencies consistently with the enterprise's indicators; 5) establishment of guidelines and surveying of innovation needs of agencies to select for the Scale Up Innovation project; 6) implementation of the scale-up process; 7) follow-up and evaluation of results, and preparation of a report on the operational results to present to the relevant executives or board members.

For 2024, the project has specified operational success to be based on 2 lagging KPIs/lagging KPI targets: 1) the number of innovations (prototypes) that have passed into the scale-up stage, consisting of 5 works; and 2) the percentage of personnel satisfaction from using process innovations, which was at 80 percent. In addition, in order for the project to achieve its goals, work monitoring indicators have been set by using 1 leading KPI/leading KPI target, namely, the number of process innovations (prototypes) that come from knowledge management, consisting of 18 works. A trigger point was also specified, namely, summarization of innovation needs from agency questionnaire records, which was completed in January 2024.

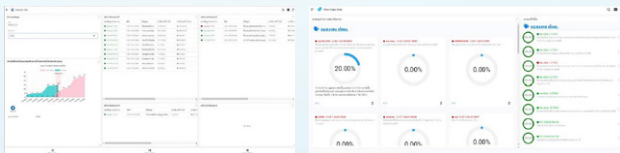
The innovative works in 2024 that supported the internal processes of the MWA are as follows:

1. **Quick Document (QD)** is a central document management tool via Web application that replaces the use of Microsoft Word for such documents as travel expense reimbursement documents, expressway fees, position certification fees, etc. Users only type in keywords and the system will retrieve employee information from the employee database, thus reducing errors and time spent on document preparation. This work is an ongoing development from the One Department, One Innovation, or One Process Development Project from fiscal year 2020 to the present, and it has also been expanded to allow employees of all departments to access it. The tool is located on the MWA Intranet under the Work Systems and Information Services title. This innovative work has an innovation usage satisfaction score of 4.39 or 87.8 percent.



2. **Easy Get by AppSheet** is an innovative work process development project that improves work in 2 steps as follows:

- 1) work permit application process before work commencement, where the vendors/contractors can fill out their application document (work permit) via mobile phone or computer, thus reducing the document waiting time from 90 minutes to only 15 minutes while also reducing use of paper.
- 2) budget and contract performance tracking process, where contract owner agencies can track their work budgets and progress through a dashboard, which can be viewed on mobile phones and computers.



3. **Cash Landing on MWA** is an innovative work process development that aligns with the data driven organization innovation theme by using big data for analysis/processing, presentation/operational decision making.

This innovative work is used for the preparation of daily and monthly statements on cash receipts and expenditures to solve the problem of delays in preparing cash receipts and expenditures reports, making the process faster and more efficient, with the work process designed to be more automatic by using the Excel program. This work has been evaluated for personnel satisfaction from the use of process innovation with a score of 4.82 or 96.4 percent.



In fiscal year 2024, Easy Get by AppSheet was expanded for use with the Bang Khen Water Treatment Plant, and this innovative work has a satisfaction rating of 4.32 or 86.4 percent.

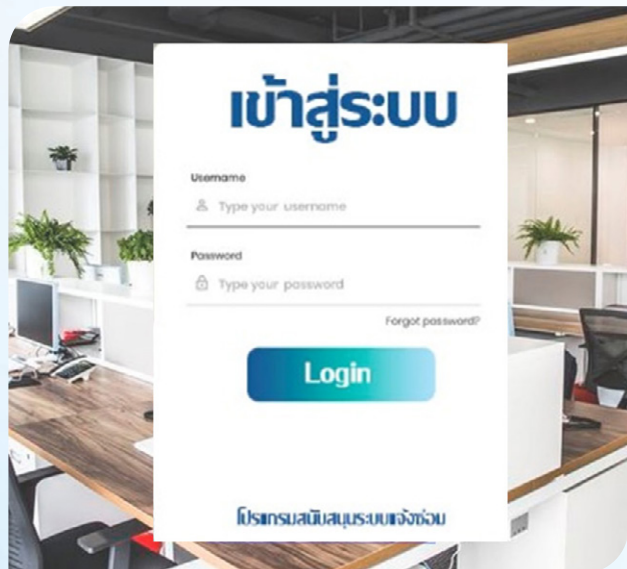
4. **Personnel Learning and Development by Use of LMS System Project** is an innovative work to improve the learning management system (LMS) process. It uses technology to enhance teaching and learning via the Internet and consists of important tools and components for teachers, students, and system administrators, including a course management system, a lesson data management system, a content management system, a learning assessment tool management system, a student management system, and a system of tools to help manage communication and interaction and organize learning processes, etc.

The MWA, through its Human Resource Development Department, has implemented an LMS system in personnel development in 2024 by over 70 courses, and this work received a personnel satisfaction evaluation from use of process innovation with a score of 4.00 or 80 percent.



5. **Fix It... QR Code** is an innovative work from the One Department, One Innovation, or One Process Development Project by the Central Service Department, which is responsible for overseeing and providing maintenance services and repairs of buildings, premises, and office equipment of the MWA Head Office and the surrounding areas.

Fix It... QR Code uses the Traffy Fondue urban problem management application to manage problems in office buildings to allow responsible agencies to conveniently and quickly learn about repair problems and reports, in addition to increasing service satisfaction. This work received a personnel satisfaction evaluation from use of process innovation with a score of 4.00 or 80 percent.



6. **Innovative Standard Equipment for Sand Protection** is an innovative work process from the One Department, One Innovation, or One Process Development Project in 2023 that won the Silver Award for Prototype Innovation in the Enterprise Innovation Awards in 2023, and the MWA expanded its use in 2024. The sand protection project arose from complaints from customers and area supervisors about clogged drains resulting from sand and debris from pipe laying and repair work falling into the drains, which can affect the consideration of future pipe laying permits from area supervisors as well as impact the enterprise's image.

The innovative standard equipment for sand protection is a device for preventing debris and sand from pipe laying and repair work from falling into drain pipes that was developed with consideration to ease of use, reasonable price, and design to suit the standard shape of various drainage wells in Bangkok and the surrounding areas, where drain covers appear as steel grates, concrete with drainages, and V-shaped covers.

The process innovation project achieved its objectives and produced results that surpassed its targets, with 18 innovative



works (prototypes) resulting from knowledge management, and 6 works accepted into the project. The success of the project could be attributed to the following:

- 1) Specification of both the leading KPI/ leading KPI target and lagging KPI/ lagging KPI target throughout the project implementation, including trigger points during implementation.
- 2) The MWA collected innovative works from many sources, such as the One Department, One Innovation, or One Process Development Project for the fiscal year, in which each department level agency invented and developed a work process and innovation for use within the agency, or the Enterprise Innovation Awards (Inno Award) Project or "The Annual Enterprise Innovation Award" in which winning projects were selected for the scale-up innovation process, etc.

● Partnership and Collaboration

Collaboration for Effective Operation

In addition to driving the organization, which requires cooperation from personnel at all levels, the MWA also builds cooperation with external agencies to ensure continuous and efficient operations by taking action and coordinating with other agencies in various areas as follows:



Coordination and Cooperation to Enhance the Organization's Operational Potential and Setting Standards

Water Pipe Installation/Water Pipe Installation Requests

The MWA uses the land of other agencies to lay water pipes to distribute water from water treatment plants to people's homes. Therefore, we coordinate permission requests to lay water pipes in the local areas and collaborate in construction efforts and structural works to improve the roads and footpaths of other agencies.



Ministry of Interior

Bangkok, Nonthaburi, Samut Prakan, local government agencies (provincial administrative organizations, municipalities, sub-district administrative organizations), and the Metropolitan Electricity Authority.



Ministry of Transport

Department of Highways, Department of Rural Roads, Marine Department, State Railway of Thailand, Mass Rapid Transit Authority of Thailand, Airports of Thailand Public Company Limited, and Expressway Authority of Thailand.



Ministry of Agriculture and Cooperatives

Royal Irrigation Department.

Academic, Technological, and Standard Setting Cooperation

- World Health Organization (WHO) on the Water Safety Plan
- Ministry of Public Health, Department of Health in the field of health science, water quality, and safe water plan
- Ministry of Industry, Thai Industrial Standards Institute in terms of engineering standards for pipes and plumbing equipment

- Ministry of Defense, Royal Thai Navy, Hydrographic Department in terms of sea level data, tides
- Thai Water Works Association



Coordination and Cooperation with Partners to Improve Services

Cooperation in Providing Public Service

To improve service quality and speed, the MWA has signed contracts with banks and payment counters such as 7-11, Big C, Lotus's, and CenPay, etc. to increase channels and facilitate water bill payments for customers.

In addition, we have partnered with department stores to operate one-stop government service centers at Central Westgate, Central Chaengwattana, and The Mall Lifestore Ngamwongwan, as well as the Bangkok Express Service Center at The Mall Lifestore Bang Khae to accept water bill payments and receive water service requests.




A survey of the service quality of the MWA's four service centers located in shopping malls found that in fiscal year 2024, customers who had service experience had a satisfaction score of 4.687, or a decrease of 0.044 from the previous year.

Cooperation in Providing Public Service Enterprise Operation through Technology

The MWA signed a memorandum of understanding (MOU) on developing a mechanism for utilizing data on electricity and water usage and payments under the consent of data owners with 5 agencies, namely, the Bank of Thailand, Digital Government Development Agency (Public Organization), Metropolitan Electricity Authority, Provincial Electricity Authority (PEA), and Provincial Waterworks Authority (PWA). The objective of the MOU is to develop a mechanism to facilitate service users in accessing their electricity and water usage history and bill payments via the “Thang Rath” application in a secure manner, with digital signature verification. This information is free of charge and can be utilized by leveraging the Digital Government

Development Agency's digital technology system to provide services and facilitate electricity and water users while also encouraging and promoting the utilization of users' electricity and water usage data, such as by sharing it with financial service providers for use alongside other data in loan consideration to increase the chances of obtaining a loan, particularly for those without a regular income or with a limited financial history. Furthermore, service providers receiving the data can automatically process it (machine-readable) and the source of the data can be verified to ensure that the information has not been falsified or altered, thus helping to increase efficiency and reduce costs in providing services to the public as a whole.





Cooperation to Develop Plumbing Products

Modified Toughness Unplasticized Polyvinyl Chloride Pipe (MT-PVC) Grade 10.5 is a new type of PVC pipe that was developed through a collaboration between the MWA and a group of PVC pipe manufacturers to improve PVC pipes to be more durable against external forces, to increase load bearing capacity and water pressure, and in the event of a leak, to cause leaks to develop as holes (limited leaks) rather than long cracks (large cracks or similar to broken glass). This will help reduce the chances of leaks and reduce the severity of damage from leaks. The MWA has an idea to use MT-PVC pipe to replace existing PVC pipes in the future, which will help accomplish the MWA's 6th Enterprise Plan on creating stability and security in the water supply system to reduce water loss from broken and leaking pipes.

In fiscal year 2024, the MWA, through the Engineering Standards Division, Engineering Standards and Geographic Information Department, together with a group of PVC pipe manufacturers and a group of plastic pellet manufacturers, organized a seminar to introduce MT-PVC pipe products and promote understanding about the benefits, properties and specific characteristics of MT-PVC pipe products, including assembly and installation methods, etc., with the MWA executives and MWA staff from various agencies joining in to listen and ask questions on various issues.



Cooperation in Building Confidence in Tap Water Quality

Recently, the MWA and the Department of Health collaborated to build confidence in the management of tap water to ensure quality in accordance with the standards of the World Health Organization (WHO) by managing tap water quality throughout the supply chain, from upstream to downstream. The cooperation between the two agencies supports the national strategy for creating growth based on environmentally friendly quality of life, in addition to delivering clean and safe tap water to the public, with equal access for all areas. This also supports the government's policy on developing water utility systems by making the tap water in the MWA's service areas, namely, Bangkok, Nonthaburi, and Samut Prakan, drinkable. The signing of the MOU on water quality management in fiscal year 2024 is to support and develop water supply services to ensure stability and sustainability with quality suitable for people's consumption and livelihoods through academic collaboration, field work, and information exchange. This enables us to solve tap water quality problems, educate the public, give warnings about tap water quality, and act as a driving force for the public to have clean and safe tap water for consumption in accordance with the jointly signed intentions.



● Efficiency of Internal Management Processes

Corporate Management

Risk Management

The MWA recognizes the importance of risk management to ensure operational effectiveness and efficiency in line with the good corporate governance principles and the enterprise's strategies as can be summarized as follows:

Raw Water Quantity and Quality

In the fiscal year 2024 from November 2023 to June 2024, the MWA was impacted by the El Niño phenomenon, leading to low water levels in dams and rising sea levels. Then from August to October, a storm moved into Thailand, leading to heavy rains, sudden floods, water overflowing banks, and high turbidity levels in raw water. However, the MWA monitored and managed water effectively according to the situation and was able to continue producing quality tap water without disruption. Meetings were held and work was coordinated with agencies in the public and private sectors to jointly manage water, and in the long term, the MWA launched projects to expand production capacity, repair, maintain, and increase clear water storage tanks while renovating water canals to hold more raw water and support future water needs. The MWA also monitors and surveys important risks by adding key water quality risk indicators in raw water sources on the western side to control the monitoring of the source of raw water used in the production of tap water.



Stability in the Production, Transmission, and Distribution of Water Supply

The MWA has preventive maintenance (PM) plans for its machinery and equipment in the water supply, production, transmission, and distribution systems, expands the production capacity of water treatment plants and renovates water supply infrastructure in addition to reinforcing water pipe networks for greater stability and strength to support future water usage requirements and maintain stability in the production, transmission, and distribution systems under the responsibility of the MWA.



Stakeholder Responsibility

The MWA manages work flexibly to remain ready to deal with disasters and emergencies that might occur in order to effectively respond to crisis. In 2024, we were able to maintain the business continuity management system (BCMS) according to the ISO 22301:2019 standard, with our scope covering raw water management, tap water production, transmission-distribution, service provision, support activities, emergency response plan rehearsals and business continuity plans to ensure confidence in stakeholders that we can produce quality water for consumers without disruption, even when the organization faces potential crises that may develop in the future.



Finances

The MWA is currently facing organizational management challenges, especially in terms of finances, which are continuously rising while minor increases in income are unable to keep up with expenses. As such, financial planning and management as appropriate to the economic situation and the status of the enterprise is vital. Therefore, the MWA has developed various tools to help improve work convenience to manage the MWA's finances and maintain sufficient liquidity and availability for use. Some of these tools are as follows:

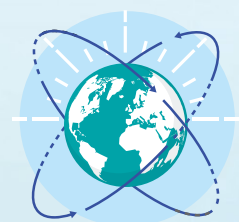
- “SAP Analytic Cloud (SAC)” – This tool presents data on a modern dashboard to enable executives to know about actual cash inflow and outflow activities and to make projections over given time periods. The tool can be used to accompany monitoring, analysis, and liquidity planning and management to sufficiently meet operational needs based on the mission of the enterprise.
- A tool for assisting calculations for funding procurement developed from the advanced use of Microsoft Excel, which includes the “Term Loan Model” and “Bond Model” to enable the MWA to estimate its loan procurement with greater speed and precision while appropriately covering every repayment condition in line with the enterprise's financial status.

Information Technology

The MWA is aware of cyber threats and recognizes the importance of preventive actions to reduce impact and control the risk of becoming a target of attacks. As such, we have created projects to increase the effectiveness of the communications network system and the water treatment and transmission systems in order to enhance cyber security effectiveness. In doing so, key activities have been carried out, including the use of a firewall system, the establishment of a security operations center (SOC) to prevent and monitor attacks, along with data access control and regular system audits and evaluation of risks from information system vulnerabilities, and we create awareness by providing knowledge to employees about preventing data from leaking outside the organization. Furthermore, the MWA rehearses the information technology business continuity plan (BCP) in case of emergencies.

Improving Water Loss Reduction Effectiveness

The MWA has taken action according to the work plan for improving water loss reduction effectiveness by creating water loss management work plans covering 5 work categories, namely reduction of water loss in the water distribution pipe system, reduction of water loss in the main pipe system, maintenance of related pipe and accessory systems, reduction of water loss from management, and water pressure management. In the first work category, i.e. reduction of water loss in the water distribution pipe system, an important work plan included performance-based contract (PBC) to reduce water loss according to set objectives. It is an ongoing effort from the previous year. In addition, the MWA gives importance to water loss management and has, therefore, created the relevant risk management plans, including a water loss target control plan from PBC projects, which produced risk management plan outcomes fully according to planned activities, especially in terms of local water loss management, which required supervision of repairs of broken and leaking pipes and expediting pipe installations to benefit performance monitoring according to established work plans, in addition to appropriately achieving the enterprise's objectives.



Internal Control

The MWA engages in internal control according to the criteria of the Ministry of Finance on the Practice Standards and Criteria for Internal Control in Government Agencies, B.E. 2561 (2018), as follows:

Control Environment

We give importance to establishing an organizational culture that emphasizes integrity. As such, we have made the MWA Code of Ethics part of the MWA Good Governance Policy and have established a governance structure on the enterprise level, division level, and agency level.

Risk Assessment

All department-level agencies and divisions unaffiliated with departments are required to set in place an internal control system and conduct a self-assessment of control according to their allocated work at least once annually or whenever situational or environmental changes occur.

Control Activities

Control activities have been set to be implemented in every work process to ensure confidence that the enterprise will achieve its objectives. The MWA's Good Governance Policy has been set as the corporate governance framework, while the Risk Management Policy and Business Continuity Policy serve as risk management guidelines to meet the organization's objectives, with management disseminating various policies to employees at every level.

Information and Communication

The MWA Enterprise Performance Management (MEPM) system has been developed as an information system that integrates good corporate governance with strategic planning, risk management, internal control, internal auditing, and business continuity management in order to holistically manage the organization by enhancing management and monitoring capabilities for agency executives. This system is expected to be completed in the fiscal year 2025.

Monitoring Activities

We continuously adopt information technology systems to provide data support to high-ranking executives as they monitor various important work, such as the information and data warehouse system for high-ranking executives, which serves as the central database, the corporate performance management information system (CPM), and the governance, risk, and compliance (GRC) integration system. In the fiscal year 2025, the MWA will focus on integrating work in different areas via the MEPM information system to achieve strategic objectives under the enterprise's mission, in addition to achieving the vision "Quality Water for Quality Living" in line with the government's policy for national development and promotion of sustainable growth.



Internal audit

The Audit Office has the primary role of operating to provide assurance and consulting services fairly and independently by assisting the Audit Committee and the management in their duties to monitor risk management, internal control, corporate governance, and various other operations of the MWA in a systematic manner, in addition to auditing performance, financial reports, and compliance with laws, regulations, and policies. The roles and responsibilities of the Audit Office have been clearly specified in the charter of the Audit Office, which is reviewed and updated at least

once annually, and roles and responsibilities are communicated to the executives and employees of audit recipient agencies for acknowledgment. Furthermore, we have created policies governing fair and honest performance of duties while retaining independence according to professional standards and ethics, in addition to developing expertise in the use of technological systems and exchanging knowledge to improve work processes and upgrade work performance according to the evaluation criteria of the 7 enablers.

Audit Performance and Reporting

We have prepared a 5-year long-term audit plan (2022-2026) and an annual audit plan for 2024 based on the risk-based audits concept, with emphasis on the organization's key risks, in line with the vision, goals, and enterprise plans of the MWA. Additionally, a project exists to develop an enterprise performance management system (MWA Enterprise Performance Management) to integrate and enhance the organization's governance process with an intelligent internal audit system for continuous auditing and monitoring. Hybrid collaboration and data analytics techniques are used to support operations, and in 2024, the operations were completed according to the annual audit plan, with advice provided to executives and audited units according to set plans, thereby helping to increase efficiency and create value for the organization. Furthermore, audit results were reported to the executives of the audited units, the Governor, the Audit Committee, the MWA Board of Directors, and regulatory agencies, and lessons learned from the audits were extracted according to the knowledge management process with learning exchanges for continuous development and process improvement (continuous improvement). Accordingly, in the operations of the Audit Office, the office had independence and no restrictions on expressing opinions, and there were no unresolved issues of conflict between the audited unit and the Audit Office.

Maintaining the Work Quality of the Internal Auditor

The internal auditor adheres to the practice guidelines in the Internal Audit Manual with quality assessments by audit recipient agencies after performing audit work, and the Audit Committee and high-ranking executives conduct an assessment (peer review) once annually to produce evaluation results and recommendations in the form of feedback information for improving and enhancing audit and consultation effectiveness. Furthermore, actions are carried out according to the plan for developing and retaining audit personnel who are knowledgeable and competent by supporting internal auditors to develop themselves to receive international professional certificates, in addition to providing annual status retention fees, and personnel are encouraged to receive in-house and external training at least 40 hours per person per year.

Audit Fees: The Office of the Auditor General of Thailand is the auditor of the MWA for the fiscal year 2024 with an audit fee of 4 million baht.

● Accessible and Affordable Services and Product

The MWA's primary mission is to provide clean, safe, and sufficient tap water to the people of Bangkok, Nonthaburi, and Samut Prakan. The MWA aims to ensure universal service access for all segments of the population and to set water prices that are appropriate for all sectors.

1. Access to MWA Services

1.1 Expansion of the Service Area

- The MWA has a project to expand its water service area to cover a greater radius, with a focus on communities that still do not have water supply systems. People living in the expanded service area where new water pipes are installed will have access to standard tap water for consumption and use equally and universally, leading to a better quality of life and well-being.
- We have coordinated with relevant agencies such as local administrative organizations (LAOs) and the National Housing Authority to ensure that the public has universal access to clean water.



1.2 Development of Technology and Service Channels

- MWA onMobile application – allows citizens to check water bills, report problems, and make payments online.
- Citizen Service Centers – located at various points to facilitate water subscriptions, information requests, and problem-reporting.
- MWA Hotline 1125 – provides information and receives complaints 24 hours a day.
- “Water-Saving Homes” Project – encourages people to efficiently use water resources.



1.3 Special Privileges for Vulnerable Groups

- We provide water supply installation services at special prices for low-income earners.
- We support the project to install tap water in slums to ensure equal access for people to clean water.



2. Affordable Prices and Water Tariff Structure

2.1 Fair Water Rates

The MWA has established a fair and appropriate water tariff structure based on water usage volume, as follows:

- General household – Step rate calculation:
The less water you use, the cheaper the unit rate.
- Educational institutions, hospitals, and public benefit organizations – receive special rates to reduce their cost burden.
- Entrepreneurs and industrial plants – Rates are calculated consistently with the cost of water production.

Water Tariffs As of December 1999

Type 1: Residence		Type 2: Businesses, Government Agencies, State Enterprises, Industries, and Others	
Water Used (cubic meter)	Water Price (baht/cubic meter)	Water Used (cubic meter)	Water Price (baht/cubic meter)
0-30	8.50	0-10	9.50 but not less than 90.00 baht
31-40	10.03	11-20	10.70
41-50	10.35	21-30	10.95
51-60	10.68	31-40	13.21
61-70	11.00	41-50	13.54
71-80	11.33	51-60	13.86
81-90	12.50	61-80	14.19
91-100	12.82	81-100	14.51
101-120	13.15	101-120	14.84
121-160	13.47	121-160	15.16
161-200	13.80	161-200	15.49
More than 200	14.45	More than 200	15.81

Notes:

- VAT not included
- Since 1 June 2004, the MWA has been collecting a raw water fee of 15 satang per cubic meter to be remitted to the Royal Irrigation Department.

2.2 Measures to Assist People During Crises

- The MWA has measures to reduce water fees or delay collection during economic downturns or disasters such as COVID-19 or droughts.
- Measures are released to reduce the expense burdens such as the “Water Price Freezing Project” to help reduce economic impacts.

The MWA focuses on ensuring access to clean and safe tap water for all groups of people, and sets fair prices to ensure fairness for both retail and industrial users. Furthermore, we have implemented measures to assist low-income earners and the general public during crises to ensure sustainable water access for all.



Social Performance



- Human Resource Potential Development
- Quality of Tap Water
- Occupational Health and Safety
- Non-Discrimination and Equal Opportunities
- Employee Benefits and Welfare
- Local Community



Human Resource Potential Development

The MWA focuses on human resource management and development, which can create quality personnel, effective organizational management, and employee well-being, under the vision of **the Human Capital Master Plan of “Quality Personnel for Service Excellence”** to prepare personnel with potential and multi-skills to support change and keep pace with the rapidly changing internal and external environments. As such,

the MWA has implemented the Human Capital Master Plan as a guideline for developing capabilities and driving human resource management (HRM) and human resource development (HRD) to meet the enterprise’s vision of “Quality Water for Quality Living,” achieve goals and enhance the enterprise’s sustainable growth in the future.

Successor & Talent Management Project

In fiscal year 2024, the MWA reviewed the criteria and guidelines for the project to prepare personnel for succession to key strategic positions and to manage talented personnel, including those with potential in the inclusive talent group, in preparation for expansion to support future business development. The project consists of 3 courses:



Successor Group (Executives Level 8-10):

Personnel are to receive development according to individual development plans (IDP) through sending them to receive training from external institutions, such as the Finance for Non-Financial Managers (Sasin) course, the X-MBA (Eddu) course, the Strategic Innovation with Entrepreneurship (PacRim) course, and the Formulating Transformation Strategies with Foresight: The Ultimate Guide for Future Success (Thailand Productivity Institute) course.



Exclusive Talent Group (Employees Level 6-7), 30 people:

Personnel received development in the MWA Talent Development course in 2024.



Inclusive Talent Group (MWA Expert Project participants), 3 batches totaling 90 people:

Personnel were developed by combining online training in the virtual class format with learning according to IDP plans through E-learning lessons, and study tours for the first batch of project participants.

Performance According to Plan Indicators

Indicators	Target	Result
1. Percentage of executives at the director level and above who are successors in key strategic positions (successors)	≥95	100
2. Percentage of personnel in the talent pool	≥5	6.61
3. Personnel satisfaction level in the factor “advancement opportunities”	>3.94	3.98
4. Percentage of participants in projects to prepare personnel to succeed to key strategic positions and manage talents, including those with potential in the inclusive talent group, who have been developed according to the specified development guidelines.	≥85	97.80
5. The level of satisfaction of project participants toward projects in preparing personnel to succeed to key strategic positions and manage talents, including those with potential in the inclusive talent group.	≥4	4.61
Success Percentage According to Plan Indicators	100 percent	

Projects to Enhance Human Resource Capabilities to Achieve Operational Excellence

The MWA has developed a newly designed curriculum for future skills with the aim to create diverse skills and further developing existing skills (reskill & upskill) for personnel in the critical common skills area, which is required across the enterprise. This curriculum is delivered in a classroom format to allow for the acquisition of knowledge from diverse perspectives and the application of development results to further develop new concepts in the workplace.

Project to develop the competencies and skills of future personnel (future skills)

are divided into:

- 1. Future Skills for Driving Change Course**
Group 1: For level 5-7 employees.
- 2. Future Skills for Driving Change Course**
Group 2: For level 5-7 employees.
- 3. Future Skill for BU Course:** For employees in the group driving the establishment of subsidiary companies (business units).



Plan to develop and enhance knowledge on water loss management

consisting of 4 courses, including a course on system use and selection of pipe renovation routes with asset management, the use of the EPANET Level 1 program, the efficient use of water meters, and the standards for pipe leak surveyors.

Plan to develop and enhance knowledge on the Water Safety Plans

consisting of 5 courses, including the course on internal quality monitoring techniques (internal audit), effective correction and prevention, factory sanitation and personal hygiene, control and prevention of disease vectors, and the Water Safety Plans: Theory to Implementation (Phase 1).

Plan for developing and enhancing the digital competency of personnel

consisting of 11 courses, including the Business Analyst Bootcamp, Batch 6; Basic Power BI program usage, Batches 1-3; MS Excel PivotTable Usage Techniques for Data Summaries and Analysis, Batches 1-2; Advanced Power BI using DAX; Basic Python Programming for Operator, Batches 1-2; and Basic Data Science for All.

Plan to enhance the capabilities of personnel in innovation and knowledge management

consisting of 9 courses, including the Knowledge Management Camp (KM CAMP), Batch 7; Knowledge Management for Work Improvement; Knowledge Management; Knowledge Management and Organizational Information Systems (KM PORTAL); Innovation Enablers; Innovation Process; Innovation Regulations; Intellectual Property for Business Innovation (IP for Business Innovation); and Knowledge Management Enablers.



Percentage of Participants from All 5 Courses that Successfully Applied Knowledge in Their Work = **100%** (Target $\geq 80\%$)

Customer Experience Plan

The personnel development plans for fiscal year 2024 stipulated training courses to develop personnel with appropriate knowledge, skills, and competencies aligned with the needs of the enterprise and various departments based on training needs. This is in line with the Master Plan for Customers, Marketing, Finance, Product Development and Related Business Services (2023-2027) and the action and risk management plans at the departmental and administrative levels for fiscal year 2024. The plans aimed to enhance personnel capabilities and strive for operational excellence under the customer experience plan. A total of seven courses were offered, with course contents divided into two groups as follows:

1. Courses on upgrading products and services to meet customer needs
2. Courses on increasing the value of core businesses and expanding related businesses for enterprise stability and sustainability



Percentage of Training Participants that Successfully Applied Knowledge in Their Work = **87.66%** (Target $\geq 80\%$)

Retiree Development Project

The MWA has organized training to prepare employees before they leave their regular jobs. This includes knowledge on finances, health care, living a happy daily life, and recommendations for supplementary jobs after leaving their regular jobs. These include:

- “Happy Retirement” course for 90 MWA employees who were due to retire in fiscal year 2024.
- “Financial Literacy for Retirees” course for 111 MWA employees who were due to retire in fiscal year 2024.
- The course “Group training project to create value and pride for employees before retirement” for 99 employees who were suitably qualified as specified by the enterprise.

Employee Development Project (retirement in 3 years)

This project consists of a course that increases skills and capabilities to perform work consistently with job positions, leading to the development of a professional staff, including the transfer and storage of knowledge in the work of employees to become knowledge of the enterprise. In total, 12 employees with appropriate qualifications as determined by the enterprise received training.



Line Managers Capability Development Project to Create Leaders in Personnel Management (People Managers)

The MWA has developed a leadership development roadmap for executives at all levels. The objective is to enhance the capabilities of line managers as leaders in human resource management (people managers). This roadmap focuses on developing competencies, enhancing capabilities, and enhancing essential management skills to drive the enterprise forward and achieve its goals with maximum efficiency. Furthermore, the roadmap aims to develop a multidimensional approach to operational adaptability, management flexibility, and the ability to more clearly communicate policies and management guidelines, with the aim to prepare for rapidly changing economic, social, and technological environments.

The Line Managers Capability Development Project focuses on learning through diverse activities and hands-on practice (activity-based learning) to develop and enhance the effectiveness of modern leaders. The results of the assessment of knowledge, understanding, and management competency and leadership of executives revealed satisfaction with training under the Line Managers Capability Development Project to Create Leaders in Personnel Management (People Managers) in fiscal year 2024 revealed an average score of 4.69, and 100 percent of line managers were able to apply the knowledge gained to their work. Additionally, 98.66 percent of executives met the enterprise's expected LC 360-degree assessment results.

Summary Report of Average Training Hours of Employees Classified by Gender and Position, Fiscal Year 2024

Average Training Hours						
Level	Total Number of Employees			Average Training Hours per Person		
	Male	Female	Total	Male	Female	Total Average
10	2	5	7	114.00	470.54	368.67
9	17	8	25	54.89	115.86	74.40
8	45	39	84	102.90	57.67	81.90
7	215	239	454	46.20	47.87	47.08
6	404	447	851	39.27	40.22	39.77
5	798	647	1,445	33.17	33.40	33.28
4	548	181	729	23.44	27.81	24.52
3	212	79	291	32.48	43.24	35.41
2	144	63	207	20.92	27.10	22.80
1	0	0	0	-	-	-
Total	2,385	1,708	4,093	33.88	39.06	36.04

Note: The total number of employees used in the calculation is as of 4 October 2024.

Human Resource Development through Scholarships

In the fiscal year 2024, the MWA sponsored 10 scholarships at the master’s and doctoral levels (in the country). Accordingly, one applicant was selected and received a scholarship for the fiscal year 2024 at the master’s level.

Personnel Competency Assessments

The MWA conducts employee competency assessments in various areas. The results are used for study, review, and analysis to develop knowledge and skill development plans for employees, enhancing their potential and the enterprise’s performance. Assessments are divided into three types:

- 1 Functional Competency (FC)
- 2 Core Competency (CC)
- 3 Leadership Competency (LC)

Competency Assessment Results of MWA Personnel for Fiscal Year 2024: Percentage of Total Employees Who Received Core Competency (CC) Assessment No. 1/2024

Level	Sex				Total	
	Male		Female			
	Person	%	Person	%	Person	%
Level 6-10 executives	425	49.25	438	50.75	863	100.00
Level 6-10 equivalent positions	258	46.24	300	53.76	558	100.00
Level 1-5	1,690	63.80	959	36.20	2,649	100.00
Total	2,373	58.30	1,697	41.70	4,070	100.00

Note: The number of employees used in the calculation is as of 1 December 2023.

Percentage of Total Employees Who Received Core Competency (CC) Assessment No. 2/2024

Level	Sex				Total	
	Male		Female			
	Person	%	Person	%	Person	%
Level 6-10 executives	448	49.78	452	50.22	900	100.00
Level 6-10 equivalent positions	285	47.74	312	52.26	597	100.00
Level 1-5	1635	63.64	934	36.36	2569	100.00
Total	2,368	58.24	1,698	41.76	4,066	100.00

Note: The number of employees used in the calculation is as of 1 June 2024.

Percentage of Total Employees Who Received Functional Competency (FC) Assessment in 2024

Level	Sex				Total	
	Male		Female			
	Person	%	Person	%	Person	%
Level 6-10 executives	425	49.25	438	50.75	863	100.00
Level 6-10 equivalent positions	257	46.22	299	53.78	556	100.00
Level 1-5	1,689	63.86	956	36.14	2,645	100.00
Total	2,371	58.34	1,693	41.66	4,064	100.00

Percentage of Total Employees Who Received Leadership Competency (LC) Assessment in 2024

Level	Sex				Total	
	Male		Female			
	Person	%	Person	%	Person	%
Level 6-10 executives	435	50.12	433	49.88	868	100.00
Level 6-10 equivalent positions	247	44.91	303	55.09	550	100.00
Total	682	48.10	736	51.90	1,418	100.00

Notes: 1. The number of employees used in the calculation is as of 1 December 2023.

2. The MWA conducts core competency assessments (CC) twice a year, while functional competency assessments (FC) and leadership competency assessments (LC) are conducted once a year.

Overview of Employee Assessment Results for 2024, with Evaluation Results Meeting and Exceeding Expectations

Item	2022	2023	% High-Low	2024	% High-Low
CC No. 1/2024	99.29	99.69	0.40	99.73	0.04
CC No. 2/2024	99.55	99.54	-0.01	99.83	0.29
FC fiscal year 2024	98.56	98.63	0.07	98.08	-0.55
LC fiscal year 2024	99.05	98.05	-1.00	99.79	1.74



Quality of Tap Water

To produce safe water that meets the quality, the Metropolitan Waterworks Authority (MWA) has considered all water production and distribution systems as crucial factors, whether they are processes relating to raw water source management, water treatment, water pipe installation, water distribution, and customer service. The MWA has adopted the principles of the Water Safety Plan (WSP) based on the World Health Organization (WHO) for the entire water production and distribution processes since 2012, along with the various quality management systems such as GHP, HACCP, ISO 9001, ISO 14001, etc.

WSP is considered a risk management plan that controls the tap water quality as a whole from the process of raw water catchments to water distribution for customers. It comprises three basic principles as follows:



The steps in the preparation of the MWA's safe water supply plan consist of policy setting, work committee appointment, water supply system information preparation, identification of hazards and risk assessment, preparation of control measures and solutions, improvement/enhancement planning, and safe water supply plan verification and review. The following are examples of critical risk management in the water supply system:

- **Raw water system:** the MWA has reduced contamination arising from the excretion of animals in raw water can be prevented by constructing a protective fence around the waterworks canals. Moreover, to reduce the severity caused by seawater contamination in raw water, we have adopted a management system that avoids pumping raw water into



Protect

To prevent an occurrence of contamination in raw water sources.



Remove

To reduce and remove contaminants from water.



Prevent

To prevent a recurrence of contamination.



the waterworks canals during a period that contains high salinity.

- **Water production system:** the MWA has adopted the GHP and HACCP systems for water production processes to ensure the continuity of producing quality and safe water for customers. This system also includes real-time monitoring to control water quality (such as turbidity and residual chlorine values in tap water) in the entire system, including sedimentation, filtration, and disinfection to be efficient. Additionally, we have established corrective measures in case the water quality does not reach the required criteria and maintenance measures to ensure the availability and stability of tools, machines, and equipment.

- **Water user service system:** the MWA repair and maintenance of the water pipeline system will follow standard guidelines to reduce the risk of contamination by pathogens. Additionally, water quality will be inspected to meet the criteria after the repair operation to ensure that the tap water is safe.



Water Quality Monitoring

To ensure safe tap water for everyone, the MWA has conducted water quality monitoring in every process of the entire system, starting from the quality of raw water received from both eastern and western watersheds and the water quality used in water production processes of every plant. This action also covers all water distribution stations and water pipeline systems in all service areas. In order to monitor the quality of tap water in its distribution system, we have coordinated with external agencies to verify the quality of tap water as well. Furthermore, the MWA has released water quality data from the automatic monitoring system and lab tests via its website so that water users can check water quality data anytime.

For the monitoring guidelines of raw water quality, we have assessed its quality by comparing the results with the water quality standards of surface water

sources, category 3, according to the Notification of the Eight National Environment Board, B.E. 2537. Regarding the water quality from production plants, distribution stations, and pipeline systems, we have assessed by comparing the results with the Criteria for Determining the Tap Water Quality of the Metropolitan Waterworks Authority, B.E. 2565, based on recommendations from the World Health Organization (WHO). If the water quality doesn't meet the MWA standard criteria, work process improvements are required to be conducted as soon as possible. However, if the chloride level soars above proper limits due to seawater intrusion into the Chao Phraya River, the MWA's conventional water treatment system cannot solve the issue. The system is not capable of eliminating chloride or salinity.

Table Showing the Average Daily Water Quality Inspection Results for the Fiscal Year 2024

Item	Unit	Average	MWA Requirements
Free residual chlorine	milligrams per liter	0.67	At least 0.2
Turbidity	NTU	0.34	Not exceeding 1
pH	-	7.24	6.5-8.5
Total solvents	milligrams per liter	362	Not exceeding 1,000
Electricity conductivity	Microsiemens/cm.	224	-
E. coli	Found-Not found per 100 millimeters	Not found	Not found



Results of MWA Water Quality Monitoring in Every Process, Compared with the Set Criteria for the Fiscal Year 2024 (October 2023 - September 2024)

	Water Quality Standards of Surface Water Sources, Category 3 ^a		Criteria for Water Quality of the Metropolitan Waterworks Authority (MWA) B.E. 2566 Based on the Guidelines of the World Health Organization (WHO)				
	Raw Water		Water Treatment Plants				Along Water Eastern Pipeline
	Eastern Pipeline Watershed	Western Watershed	Bang Khen	Mahasawat	Sam Sen	Thon Buri	
Number of samples	12	12	12	12	12	12	3,576
The number of samples that did not meet the criteria (One sample may not meet the criteria in more than one area.) ^b	6	1	1	3	0	3	460

Source: Water Quality Evaluation Division, Water Quality Department

Remarks:

- Water quality standards for surface water sources Category 3 are according to the National Environment Board Announcement No. 8 [B.E. 2537 (1994)], issued under the National Environmental Quality Promotion and Conservation Act, B.E. 2535 (1992), Re: Determination of Water Quality Standards for Surface Water Sources.
- Details of non-compliant parameters:
 - Raw water quality testing reports only samples that have been tested for all parameters in accordance with the water quality standards for surface water sources, Category 3^a.
 - Raw water on the east side: Non-compliant parameters include BOD and dissolved oxygen (DO).
 - Raw water on the west side: Non-compliant parameters include total coliform bacteria and fecal coliform bacteria.
 - Water treatment plants: Non-compliant parameters include aluminum.
 - Water distribution pipes: Non-compliant parameters include free residual chlorine and turbidity.

When comparing the table showing the results of water quality testing at every stage of the MWA in the fiscal year 2024 with the criteria used, there were raw water samples that did not meet the water quality standards for Category 3 surface water sources, as per the National Environment Board’s announcement on raw water sources on the east and west sides. The details of the non-compliant parameters are listed in the remarks. These were caused by the Chao Phraya and Mae Klong rivers’ raw water used in water treatment being contaminated with low-quality water from communities and agricultural areas along the rivers, making it necessary to treat raw water that undergoes the tap water treatment process, with the WSP principles

applied in every step to ensure that treated water meets the water quality standards of the MWA. In the fiscal year 2024, the quality of tap water samples randomly collected from water distribution pipes across all 18 of the MWA’s service areas, 3,576 samples in total, had 460 samples that did not meet requirements, or 13%. The non-compliant parameters were free residual chlorine, turbidity, and aluminum.

As for data on complaints about tap water quality for the fiscal year 2024, there were 1,733 consumers made complaints via the MWA Call Center and 26 consumers who complained directly via the Water Quality Department.

Occupational Health and Safety



The MWA's occupational health and safety management is carried out in accordance with various laws, such as the Occupational Safety, Health, and Working Environment Act, B.E. 2554 (2011), ministerial regulations regarding standards for the administration and management of safety, health, and the working environment, and the State Enterprise Labor Relations Committee's Announcement Re: Minimum Standards for Employment Conditions in State Enterprises, B.E. 2549 (2006), using them as the framework for setting the **Safety, Security, Health and Environment (SSHE) Policy**, announced on 5 July 2024, covering all departments, employees, and operators at all levels, to support social and environmental responsibility within the production and service delivery processes, which are core processes in the MWA's value chain,

and other operations. The MWA requires departments to comply with applicable laws and policies.

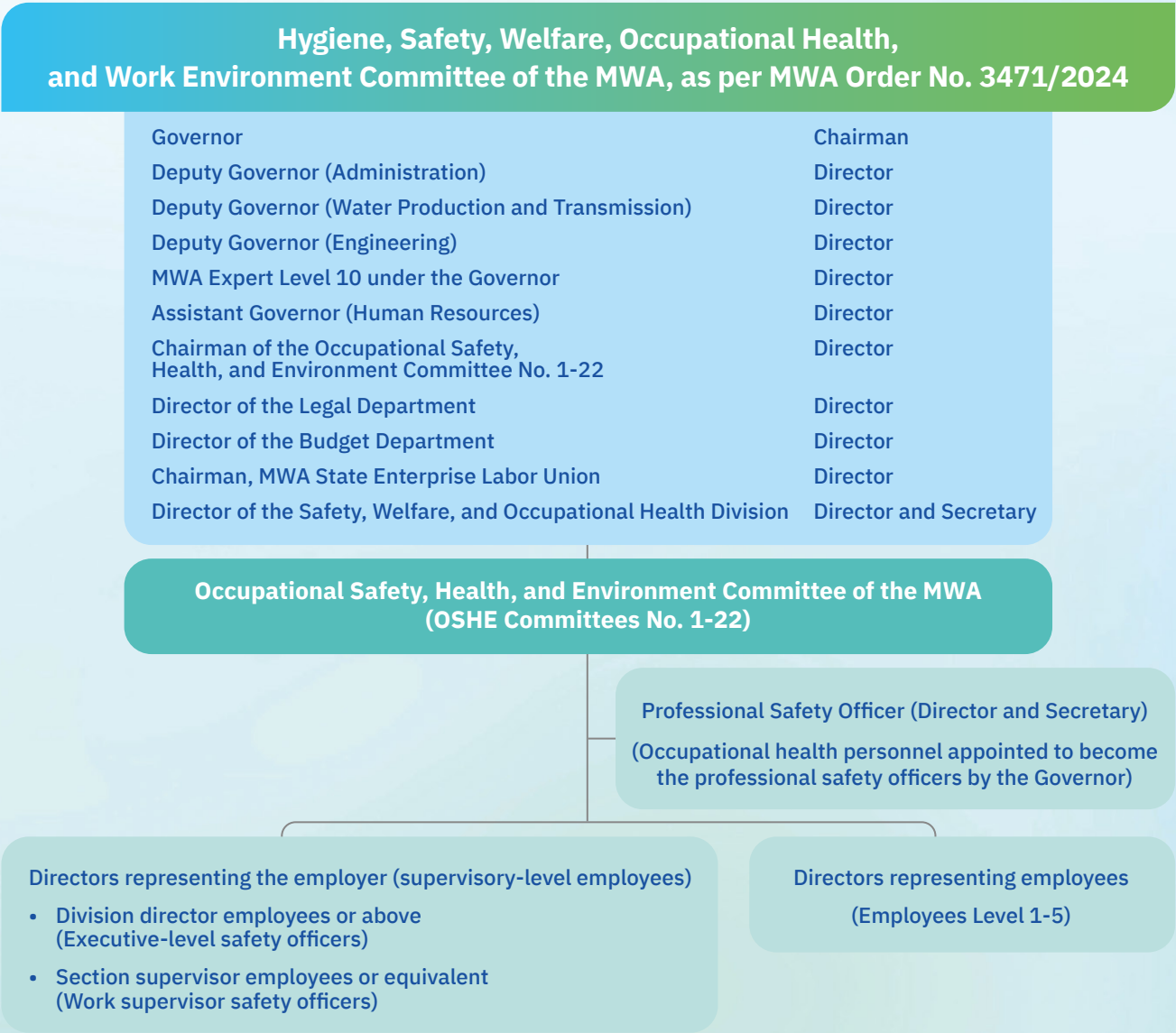
The MWA has a process to systematically create and promote safety, security, health, and environment (SSHE model), which is implemented under the Human Capital Master Plan HCMO2-T2-P3 along with a project to enhance security, safety, health, and environmental management (SSHE-excellence) under the Hygiene, Safety, Welfare, Occupational Health, and Work Environment committee. The Committee, which is responsible for policy-setting and plan implementation, operates in conjunction with the Safety, Security, and Health Division, functioning as the central agency for planning the enterprise's safety management system.



Hygiene, Safety, Welfare, Occupational Health, and Work Environment Committee

The MWA has appointed occupational health personnel to be employees in the position of professional safety officers in all 22 establishments to staff each OSHEC, and we have also appointed employees who completed training on different levels and who are awarded certificates from the Safety and Health at Work Promotion Association (Thailand), under Her Royal Highness Princess Maha Chakri Sirindhorn Patronage to have them serve as work safety officers (SOs) in the management and supervisory level with

the Governor signing their appointments. The Occupational Safety, Health, and Environment Committee and SOs will work together to drive plans and carry out health measures along with safety, occupational health, and environmental measures in every area that might impact employees and communities. This includes preparing employees, for example, through firefighting drills, disease prevention, landscaping, health promotion exercises, annual health check-ups, and more.



Remarks:

(1) OSHEC means the Occupational Safety, Health, and Environment Committee.

(2) OSHEC is appointed in accordance with the Ministerial Regulations on an annual basis. Each enterprise consists of representatives of the employers (executive level) and employees (operational level). The meetings on Safety shall be held every month to discuss matters relating to safety. It also includes defining the communication channels for communicating the policies to employees/subcontracted workers in each entity, as well as organizing activities that create understanding and awareness regarding the safety and environment in the workplace.

6 Steps to Develop and Promote SSHE



Incident Investigation Process for the Work-Related Risk

The MWA's entity in charge performs duties in investigating safety according to the designated procedure. If a potential safety risk is found, it is required to prepare a corrective report with a definite timeframe to complete. Also, a progress summary report is required to be presented at the monthly meeting. The Safety Committee is required to supervise all operations according to the procedures for reporting unsafe incidents. If one of the employees/operatives witnesses an unsafe incident, it is required to report it

in accordance with the designated procedures, along with the accident reporting process. Each MWA entity is required to prepare a report on work-related hazards and illnesses, Form No. 001 for Employees and Form No. 002 for Operatives. Moreover, the Safety, Welfare and Occupational Health Division is also required to collect those data and investigate the incidents before presenting it to the Meeting of the Safety Committee to determine the workmen's compensation.



Work-Related Risk and Hazard Management

Currently, the MWA conducts an assessment of work-related risks and hazards, but it does not cover all entities. Initially, the preparation of the Master Plan on the Occupational Health and Safety Management Standard Systems (ISO 45001:2018) has been piloted at the Mahasawat Water Treatment Plant and the Bang Khen Water Treatment Plant. The Mahasawat Water Treatment Plant received ISO 45001 certification for its occupational health and safety management system from the Management System Certification Institute

(MASCI) on 5 July 2023, and the Bang Khen Water Treatment Plant received certification on 8 September 2023. Such a system consists of the Hazard Identification, Risk and Opportunities Assessment according to the nature of routine and non-routine operations. It also includes a risk management plan for occupational health and safety management in alignment with the principle of the Hierarchy of Controls to prevent and minimize the risks at the workplace.



Elimination

Substitution with materials, processes, guidelines, or equipment with a lower degree of hazards, for example, originally, the MWA used paints containing hazardous chemicals (Toluene) to spray the flow meters. Later, it switched to a new generation of watercolors that did not contain harmful chemicals (Toluene).



Engineering Controls

Such as the installation of neutralization vaporizers to prevent chlorine gas leakage.



Warnings

Such as the installation of chlorine gas leakage detectors/ fire alarms and hazard warning signages according to the nature of each job.



Safety Training for Employees and Subcontracted Workers

The MWA provides safety training through various courses in line with the specifications of the law and provides safety and occupational health training for employees at each level and related parties and other training in special operations, such as work in confined spaces, work involving electricity, and work

involving the use of a forklift, etc. Training is provided to related employees and contract workers before the start of work with knowledge measurement before and after training. In the fiscal year 2024, we provided the following training.

Occupational Health and Safety Training Program

Courses	Number of training	Persons
1. Safety Officer (Supervisor level): The participants were section heads or equivalent.	2	79
2. Safety Officer (Executive level): The participants were the division directors or equivalent.	1	36
3. Roles and Responsibilities of the Safety Committee: The participants were members of the Safety Committee.	1	30
4. Safety at the workplace relating to the electrical works and the rescuing methods for electrical hazard victims: The participants were employees who were members of the Occupational Safety, Health, and Environment Committee and employees related to electrical work.	3	142
5. Fire Evacuation Drills: The participants were employees and contract workers from all MWA entities.	25	3,489
6. Primary Fire Extinguishing: The participants were employees in every place of business of the MWA.	12	656
7. Occupational Health, Safety, and Environment for the general employees and new employees in accordance with the Occupational Safety, Health, and Environment Act, B.E. 2554 (2011): The participants were new employees who had not yet been trained.	1	29
8. Basic First Aid and Resuscitation: The participants were members of the Safety Committee and employees at every level.	2	97
9. Leaders, supervisors, rescuers, and workers in confined spaces: The participants were workers who worked in confined spaces.	2	55
10. Crane Controller-high tower cranes, cars, boats, cranes, trucks with cranes (mobile): The participants were workers involved in related work activities.	1	18
11. Overhead Crane Controllers-high-gantry cranes, and other stationary cranes: The participants were workers involved in related work activities.	2	48
12. Use of forklifts, inspection, and maintenance for safety at the workplace: The participants were workers involved in related work activities.	1	8
13. Review of Safety Procedures for Working in Confined Spaces: The participants were workers involved in related work activities.	1	19

Communication and Development of Understanding about Occupational Safety, Welfare, Occupational Health, and Environment

In addition to providing safety knowledge through various training courses in accordance with the law, each Safety Committee (22 committees total) also held activities to promote knowledge, understanding, and awareness in employees and contract workers extensively about safety and how to create a good work environment with a contest held about the performance of each Safety Committee (22 committees total) as a tool to encourage efforts to continually drive

safety, welfare, occupational health, and environmental policies. Accordingly, a competition evaluation subcommittee evaluated the committees according to 2 competition criteria, i.e. documents and on-site evaluations, and the competing agencies were divided into 2 types, namely factories and offices. On 16 August 2024, the Governor of the MWA gave 6 shield honor awards to entities with Safety Committees that excelled in occupational safety, health, and environment in 2024.

Statistics Table Showing Work-Related Injuries and Deaths During the Fiscal Years 2020-2024




	Fiscal Year				
	2020	2021	2022	2023	2024
Injury Frequency Rate: I.F.R.					
• Target (not over)	0.24	0.20	0.20	0.2	0.15
• Result	0.15	0.15	0.30	0	0.38
Injury Severity Rate: I.S.R.					
• Target (not over)	3.18	1.50	1.50	0.75	0.15
• Result	0.59	2.65	0.45	0	3.97
Recordable work-related injuries					
• Number of work-related injuries (up to 3 days off) (case)	0	0	2	0	1
• Number of work-related injuries (more than 3 days off) (case)	1	1	0	0	2
High-consequence work-related injuries	0	0	0	0	0
Number of work-related deaths	0	0	0	0	0

Notes:

1. Data collection process refers to the collection of work hours from the HR systems resulting from taking leave, working overtime, and shifting operations, applying the American National Standards Institute for calculating the I.F.R. and I.S.R. In the fiscal year 2024, there were 7,831,112 work hours, with a reference of 1,000,000 work hours. However, the MWA currently collects data on work-related injury statistics from the contracted workers systematically.
2. High-Consequence Work-Related Injuries refer to the number of workers who have been injured at the workplace and required to take more than six months off, but do not include work-related deaths (as defined in accordance with the requirements of GRI 403-9: Work-related injuries).

From the statistics table on work-related injuries and fatalities, two employees were injured and required to take a leave of absence for more than three days, and one employee was required to take a leave of absence for no more than three days, which constituted recordable work-related injuries (injuries requiring medical treatment) according to the definitions in the accident reporting regulations. As a result, all Occupational Health and Safety Committees (OHSCs) were reminded to strictly supervise and ensure that employees and contractors comply with regulations, safety manuals, occupational health, and the work environment.

In any case, although the MWA conducts annual health screenings for employees and contractors based on risk factors to prevent and mitigate occupational health impacts, and requires new employees assigned to units exposed to risk factors to undergo a pre-employment health screening (baseline) as required by law, the MWA has not yet collected statistics on work-related illnesses. In the fiscal year 2024, the MWA hired an occupational medicine physician to provide examinations, treatment, and counseling by referring employees with abnormal results from the risk factor health screening for follow-up visits as follows:

Item		Number (people)	Doctor Visits (people)
	Hearing	62	45
	Vision	65	23
	Lung Capacity	37	25

Since the fiscal year 2024 is the first year the MWA has hired a part-time occupational medicine physician to act as a consultant and follow up on the health status of employees who have abnormal health examination results based on risk factors (follow-up), it is still not possible to clearly indicate the trend

of occupational diseases. Nevertheless, the MWA will continue to follow up and monitor the abnormal health examination results in the following years. From the results of the follow-ups, it was found that in the fiscal year 2024, no employees were found to be sick with occupational diseases.

Health Support

The MWA launched various health promotion projects and provided care for the mental health of employees, such as through the “Mobile Stress-Relief Service Vehicle” Project to boost employee mental health and by holding the lecture under the title “Simple Stress-Relief Methods during COVID-19”, etc. Moreover, the MWA provides treatment and medical services along with disease diagnosis and consultation services for employees and their families, including retirees, spouses of retirees, covering medical, dental, pharmaceutical, and clinical pathological care. In cases where illness symptoms are beyond the capacity of management, employees are also referred to or recommended to receive treatment at other hospitals with better capabilities.

Moreover, the Medical Service Division analyzes the annual health check-up results of employees to create projects to correct health problems. For example, health knowledge training was provided to employees about diabetes and easy stress relief during COVID-19 (New Normal), along with heart disease screening in working-age and elderly people and measures and practice guidelines for dealing with COVID-19, which has become an endemic disease, etc.



● Non-Discrimination and Equal Opportunities

In addition to operating with consideration for personnel rights, the MWA also prioritizes and respects human rights. As such, the following guidelines have been established:



Provide equal rights and adhere to the principles of equality and fairness in human resource management, including recruitment, development, promotion, welfare provision, and fair compensation consideration based on performance, by operating within the framework of relevant laws, regulations, rules, and orders, such as the State Enterprise Labor Relations Act, without discrimination on the basis of race, gender, religion, or other forms of discrimination.



Provide personnel with freedom of expression and access to information, and promote the freedom to form and organize groups without interference, such as by joining the MWA State Enterprise Labor Union and the MWA Good Governance Council.



Provide facilities to support operations and encourage personnel to continuously learn and develop their potential while improving their quality of life.



Support and supervise contractors and business partners to treat employees in accordance with labor laws, while refraining from supporting forced labor, illegal migrant labor, or child labor.



Provide consumers with equal access to services.





Provide stakeholders with rights to access and receive information in a transparent and fair manner, including various channels for inquiries and complaints, such as the 1125 Call Center, various social media platforms, and the Ministry of Interior's Damrongtham Center.



Prioritize the protection of personal data by announcing a personal data protection policy.



Support persons with disabilities in accordance with the law such as by providing employment, sales locations, and facilities for persons with disabilities.



Announce policies demonstrating a commitment to human rights, such as the Social and Environmental Responsibility Policy, which adheres to the 7 core management principles of the ISO 26000 international standard, the Sustainable Development Policy, the Good Corporate Governance Policy, the Stakeholder Policy and Practices, the Safety, Welfare, Occupational Health, and Environment Policy, etc.



● Employee Benefits and Welfare

Employee Benefits and Welfare for the Fiscal Year 2024

Employees are not just part of the enterprise but are key components that make the MWA a leading state enterprise today. They are the key cogs that help drive and propel the enterprise's operations toward sustainable success. For this reason, the MWA has established a policy to care for its employees with appropriate, comprehensive, equitable, and fair compensation, welfare, and benefits to enable employees to work happily and be able to compete with leading organizations in the same business, according to the Happy Workplace policy.

In the fiscal year 2024, the MWA implemented projects to enhance the promotion of welfare services and reviewed relevant inputs and feedback data for use in determining and developing compensation and benefits. These included past performance (fact-based), comprehensive employee engagement (VOE) through various channels, such as employee engagement and satisfaction surveys, MWA employee satisfaction surveys on welfare and benefits, negotiations through the MWA State Enterprise Labor Union, the Governor's performance announcement meetings, and online channels such as the intranet

complaint system, Facebook, and LINE, roadshow events, and agency telephone notifications. Furthermore, compliance with labor laws and regulations was also reviewed, and operations were compared with peers, best practices, and HR trends. Overall analysis revealed that employees wanted the MWA to improve welfare and healthcare benefits to be appropriate for the current economic situation, provide a variety of healthcare options, with coverage for family members, and there were also other issues, including employee demands for the MWA to provide investment training, provide a provident fund with diverse investment options, offer low-interest loans, and improve and develop technology systems to support welfare operations. In the fiscal year 2024, the MWA organized additional investment training and expanded the provident fund's investment policy to include the option to invest in "gold funds," effective as of 1 October 2024. Additionally, the MWA reviewed employee and family benefits agreements with two private hospitals, bringing them up to date. Furthermore, the MWA provided low-interest loan benefits (with deposits) in collaboration with the Government Housing Bank.



Employee benefits and welfare were implemented with a comprehensive consideration of various dimensions, including life and health, self-development, and other special benefits. Employee opinions and needs were analyzed and developed for continuous improvement, and key performance reports were presented at various executive meetings and communicated to employees once improvements to benefits and welfare were completed. Performance was also monitored and evaluated for future improvements to align with changes in the enterprise's environment.

The MWA established a Labor Relations Committee within the MWA to serve as a joint consultation committee. Representatives from both the employer and employees collaborate to identify solutions and improve employment and working conditions, or revise regulations that will benefit both parties, thus fostering good relations and leading to smooth and successful management within the enterprise in accordance with the State Enterprise Labor Relations Act, B.E. 2543 (2000).

In addition, the MWA State Enterprise Labor Union was established to protect employee welfare and benefits, as well as act as a mediator in monitoring improvements in employment conditions and welfare

and in receiving complaints and providing advice to employees. This includes allowing the president of the MWA State Enterprise Labor Union to join key subcommittees, including the Corporate Governance (CG) and Corporate Social Responsibility (CSR) Subcommittees, in addition to serving as a member of the working group responsible for considering welfare and various benefits in order to ensure equal rights to express opinions and fully protect the rights of personnel and promote regular participation in MWA activities to foster harmony and cooperation and create positive outcomes for the enterprise and its personnel, without any conflict.

The activities for continuous improvement of employee benefits and welfare, as well as the establishment of good relations with the MWA's State Enterprise Labor Union, have resulted in higher levels of satisfaction with compensation and benefits compared to the previous year, with a satisfaction score of 4.2030 in 2024 (4.05 in 2023). The satisfaction level in the "Compensation, Worklife" dimension has also increased, reaching 4.2058 in 2024 (4.140 in 2023), thereby helping to raise enterprise engagement to 93.07% (93.04 in 2023).

Welfare to Support the Family Institution

In addition to prioritizing equal treatment for employees, the MWA has consistently supported welfare programs for mothers, children, and families. These programs include child welfare payments, the establishment of "Oun Jai Rak (Warm Love)" rooms to provide a safe space for mothers to store breast milk, and the granting of paternity leave to employees following maternity leave, as well as leave to support their wives during childbirth. In the fiscal year 2024, the MWA revised its regulations and practices to align with the law and Cabinet resolutions by adjusting maternity leave from 90 to 98 days and piloting a new working lifestyle model to count "working hours" in various departments in order to create a better work-life balance for employees. The MWA's emphasis on the family institution is also in line with the basic measures and key success factors in the business

sector handbook on family-friendly policies that was developed by UNICEF, in addition to being in line with UNICEF's Children's Rights and Business Principles.



Local Community

The MWA has been caring for communities in various areas through many projects aimed at improving people's quality of life and promoting community progress in multiple dimensions. These include water and natural resource conservation, improving community water systems, organizing training and knowledge transfer on water systems, which is a core competency and expertise of the enterprise, and organizing activities that help the enterprise sustainably and harmoniously connect with communities.



Key Community Strengthening Projects

The MWA has implemented projects to strengthen key communities by leveraging the enterprise's core competencies. This initiative aims to provide underprivileged communities and societies with access to clean water for consumption, use, hygiene, and a better quality of life. The initiative includes procuring and improving school water supply systems, developing groundwater wells, water filtration systems, pumping systems, and piping systems, including the procurement of elevated tanks for storing rainwater and groundwater, along with prefabricated gutters, not to mention other activities beneficial to schools. The selection criteria for key communities include areas where the MWA's expertise and capabilities can be leveraged to strengthen key communities, including communities within the MWA's operational areas along the eastern and western canals, and communities within the MWA's service areas in three provinces (Bangkok, Nonthaburi, and Samut Prakan). In the fiscal year 2024, the MWA has made local visits to improve the water supply system and drinking water filtration system, as well as improve school buildings, bathrooms, and ceilings. This included painting of buildings and improving the surrounding landscape for schools and communities in the area around the Tha Muang Raw Water Processing Station, covering a total of 3 locations as follows:

- (1) Wat Pho Sri Sukharam School, Wang Sala Sub-district, Tha Muang District, Kanchanaburi Province;
- (2) Ban Mai Sub-district Learning Promotion Center, Ban Mai Sub-district, Tha Muang District, Kanchanaburi Province;
- (3) Nong Tako Temple School, Khao Noi Sub-district, Tha Muang District, Kanchanaburi Province.

MWA Plumber for People Project (Communities Surrounding Water Treatment Plants)

The **MWA Plumber for the People Project** aims to transfer knowledge, which is the organization's core competency and expertise, to the general public. Project participants receive training in the plumbing profession along with basic pipe system maintenance, as well as promote the gathering of plumbers into groups to exchange knowledge through a network of cooperation with the MWA. The project enables those who have completed the training to use their knowledge to repair water systems in their homes or help communities in various places, including further developing their careers as professional plumbers to generate additional income. In the fiscal year 2024, the MWA organized the **Plumber for the People training course** in 3 batches and brought the trainees to repair the water systems of temples and schools in the **Plumber for the People CSR activity** in 2 locations.

In addition to providing knowledge and skills to the general public, the MWA has provided training to employees who retired in the fiscal years 2022-2024 and general employees so that employees can learn about the plumbing profession and maintenance of plumbing systems, sanitary ware, and repairs of plumbing equipment in the home to be able to take care of oneself and their families. In the fiscal year 2024, training was provided in the **"Basic Plumbing for Employees and Retirees" course** in 2 batches with 77 training participants. In addition, to expand opportunities for developing skills and careers in society, the MWA expanded the project by cooperating with the correctional institutes and juvenile observation and protection centers to train well-behaved prisoners in the plumbing profession. It led to the creation of the **"Creating Opportunities, Creating Jobs"**, by which the basic plumbing training course was organized for two batches of inmates at Klong Prem Central Prison, Lat Yao Sub-district, Chatuchak District, Bangkok, and Bang Kwang Central Prison, Suan Yai Sub-district, Mueang Nonthaburi District, Nonthaburi Province, with a total of 60 inmates receiving the training.

Youth Water Conservation and Water Conservation School Network Project

The Youth Water Conservation and Water Conservation School Network Project has the objective of promoting, stimulating, and instilling awareness in youths to recognize the importance of water resources and the environment, and encouraging them to use water wisely in order to grow up to be an important force in the sustainable conservation of water resources and the environment, while expanding results to their families and communities, with schools serving as a support network, in addition to coping with the water crisis caused by abnormal droughts or the El Niño phenomenon in the long term. In the fiscal year 2024, the MWA organized the youth water conservation activities under the Youth Water Conservation and Water Conservation School Network Project 4 times as follows:

- The first time was at Wat Sadet Community School, Mueang Pathum Thani District, Pathum Thani Province, with 4 schools under the Office of the Primary Education (SorPhorPor.) Area 1, Pathum Thani Province, participating in the activity.
- The second time was at Wat Nawong School, Mueang Pathum Thani District, Pathum Thani Province, with 4 schools under the Office of the Primary Education Area (SorPhorPor.) Area 1, Pathum Thani Province, participating in the activity.
- The third time was at Thung Song Hong School (Kuptasathien Uthit), Thung Song Hong Sub-district, Lak Si District, Bangkok, with 4 schools under the Lak Si District Office, Bangkok, participating in the activity.
- The fourth time was at Wat Thong Sutharam School, Wong Sawang Sub-district, Bang Sue District, Bangkok, with 4 schools under the Bang Sue District Office, Bangkok, participating in the activity.

MWA Project to Conserve Watershed Forest

The MWA continues the integrated natural resources conservation and restoration project model through the “MWA Project to Conserve Watershed Forest” in the fiscal year 2024 to promote water resource conservation and forest and soil conservation, and create continuous and stronger participation with upstream communities, network agencies, and the MWA. This supports the MWA’s main mission of producing quality tap water to ensure a sufficient and sustainable source of raw water. We have organized activities to improve the community quality of life and conserve natural resources in upstream areas under the “MWA Project to Conserve Watershed Forest” in the fiscal year 2024 in Song Kwae District, Chiang Klang District and Pua District, Nan Province, as follows:

- The MWA constructed a multi-purpose building and renovated the solar water system for Ban Pang Kom School, Chon Daen Sub-district, Song Khwae District, Nan Province.
- The MWA renovated the mountain water supply system for Ban Pha Nam Yoi School, Phaya Kaeo Sub-district, Chiang Klang District, Nan Province.

- The MWA donated computers for education to 6 schools in the area, including Ban Sakad Tai School, Si Sa Wong School, Ban Pha Nam Yoi School, Ban Pha Wiang School, Ban Na Bong School, and Ban Pang Hok School.
- The MWA participated in a “forest ordination” activity and created a forest firebreak with the local community at Ban Huai Hat Community Forest, Uan Sub-district, Pua District, Nan Province.
- The MWA organized a volunteer activity to build weirs to slow down water on the occasion of the auspicious ceremony of His Majesty the King’s 6th cycle birthday anniversary on 28 July 2024, together with a group of volunteers from Bhumibol Dam, community leaders, and people in the area of Yan Ri Sub-district, Wang Man Sub-district, Sam Ngao Forest Conservation Group and a forest protection unit at TorKor. 16. (Denmai Sung). In total, 123 semi-permanent weirs were constructed in the community forest area at the entrance of Bhumibol Dam.





Environmental Performance



- Water and Effluents
- Energy and Greenhouse Gas Emissions Management
- Effluent and Waste



Water and Effluents

Water Management for Tap Water Production

The Metropolitan Waterworks Authority (MWA) recognizes the importance of water resources to the agricultural, industrial, and household sectors. Therefore, we have created effective raw water management guidelines for use in tap water production in collaboration with agencies responsible for systematically overseeing water issues to allocate raw water for tap water production. We closely coordinate with the Office of National Water Resources and the Royal Irrigation Department during the dry season. While doing so, the MWA assesses the quantity of raw water needed for the production of tap water in advance for the dry season each year by making predictions based on multiple factors, such as the water usage behaviors of the population, water usage trends in various sectors and production plans that are updated at different time periods, etc. Next, we send the estimated figure of raw water required for use during the dry season to the Royal Irrigation Department by October of each year in order to use the information as a guideline for setting the overall water drainage plans of the country and cultivation plans in each river

basis suitably according to the amount of water capital available at the end of the rainy season.

The MWA obtains raw water from 2 main sources for tap water production. For the eastern side, raw water is sourced from the Chao Phraya River (Bhumibol Dam, Sirikit Dam, Khwae Noi Bamrung Daen Dam, and Pa Sak Chonlasit Dam), while raw water for the western side is obtained from the Mae Klong River (Srinakarin Dam and Vajiralongkorn Dam). In the fiscal year 2024, the MWA used a total of 1,664,992 megaliters of raw water on the eastern side (1,665 million cubic meters) and 568,056 megaliters (568 million cubic meters) on the western side. The raw water collection point on the eastern side is located in an area with a high level of water stress, while the raw water collection point on the western side is located in an area with a moderate to high level of water stress. The raw water from both sources is freshwater with total dissolved solids (TDS) below 1,000 mg/l, with the total annual average values on the eastern and western sides at 275 and 126 mg/l, respectively.

Quantity of Raw Water Used by the MWA for Water Production in the Fiscal Years 2022-2024



Remark: Data as of 30 September 2024

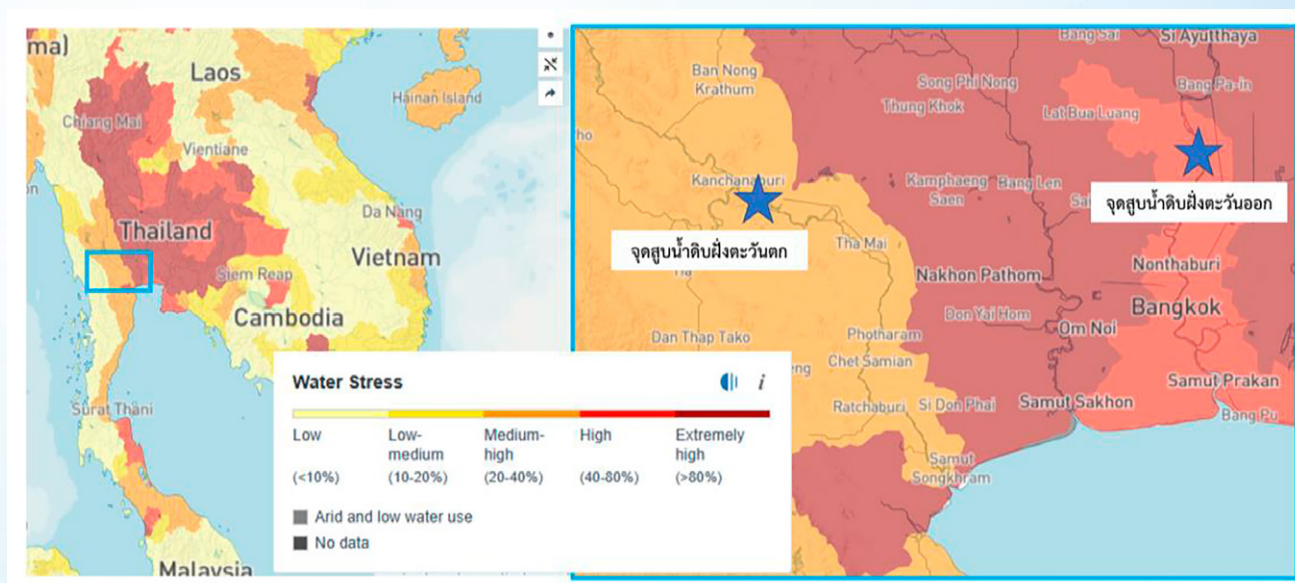


Figure Showing the Raw Water Collection Points of the MWA Compared with the Water-Stressed Area Map

Reference: <https://www.wri.org/applications/aqueduct/water-risk-atlas/>

The raw water the MWA uses to produce tap water is allocated under the “Irrigation Zone Water Management and Dry Season Crop Cultivation Plan” of the Royal Irrigation Department, which is a plan that was evaluated based on the volume of usable water and water already allocated for various water use activities in the river basins. For the dry season, the Chao Phraya River Basin has a six-month duration, starting from November to April next year, and the Mae Klong River Basin has a six-month duration, starting from January to June.

The amount of raw water that the MWA was allocated in the 2023/2024 dry season in the Chao Phraya River basin was 900,000 megaliters (900 million cubic meters) or 9.80 percent of the total usable water volume as of 1 November 2023 [The total volume of usable water was 9,187,000 megaliters (9,187 million cubic meters.)]. Meanwhile, for the Mae Klong River Basin, the MWA was allocated 460,000 megaliters of water (460 million cubic meters) or 4.98 percent of the total volume of usable water as of 1 November 2023 [The total volume of usable water was 9,233,000 megaliters (9,233 million cubic meters.)].



Table Showing the Total Raw Water Allocated by the Royal Irrigation Department and Total Usable Water Received from the Chao Phraya River Basin and the Mae Klong River Basin During the Dry Season in the Fiscal Years 2022-2024

Unit: Megaliter

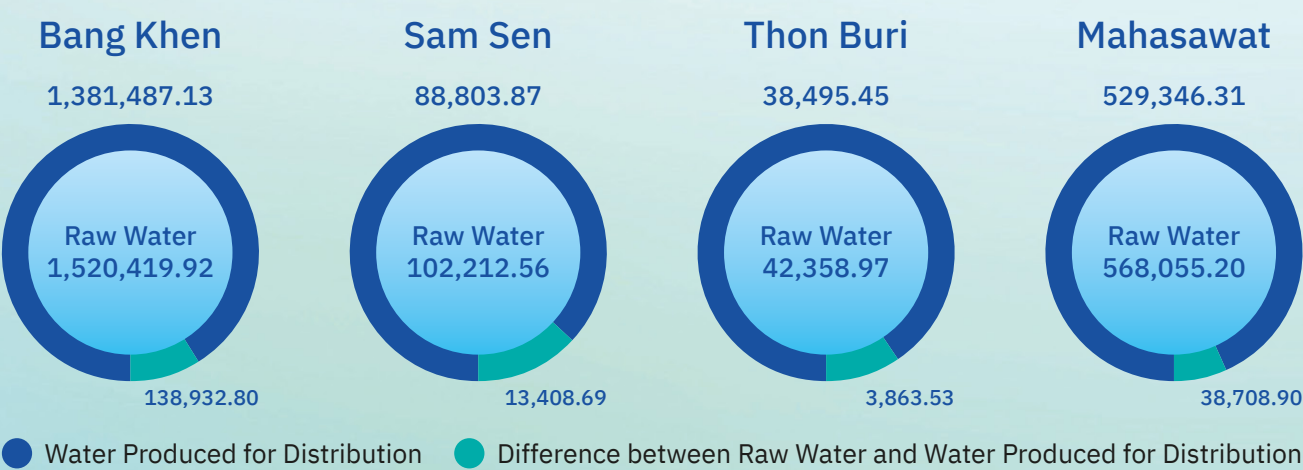
Fiscal Year	2022	2023	2024	Amount of Water Allocated as a Percentage of Total Water Available for Use*
The Chao Phraya River Basin				
Allocated raw water by the Royal Irrigation Department	900,000	900,000	900,000	9.80
Allocated raw water	859,541	841,691	825,319	
Percentage	95.50	94	91.71	
The Mae Klong River Basin				
Allocated raw water by the Royal Irrigation Department ²	460,000	460,000	460,000	4.98
Allocated raw water	300,626	275,967	286,939	
Percentage	65.35	59.99	62.38	
Total raw water received from 2 water sources				
Allocated raw water by the Royal Irrigation Department	1,360,000	1,360,000	1,360,000	
Allocated raw water	1,160,167	1,117,658	1,112,258	
Percentage	85.31	85.31	81.78	

Remarks:

1. Data as of 30 September 2024
2. Adjust the allocated raw water volume in the Mae Klong River Basin during the dry season to align with the "Water and Crop Management Plan for the Dry Season in the Irrigation Area," changing the previous figure used by the MWA from 360 million cubic meters to 460 million cubic meters in accordance with the plan.

Table Showing Raw Water Used for Production and Tap Water Produced for Distribution by Location Water Treatment Plants

Unit: Megaliter



Remark: Data as of 30 September 2024

Reuse of Effluent Generated by Water Production Processes

We realize the importance of being responsible for our water resources. The Mahasawat Water Treatment Plant therefore has formulated a method for reusing effluent generated by the water production process (Reuse: filtration reservoir cleaning) with turbidity in the normal standard. The amount of recycled effluent for the fiscal year 2024 is shown in the table below.



Table Showing Total Recycled Effluent for the Fiscal Year 2024 of the Mahasawat Water Treatment Plant

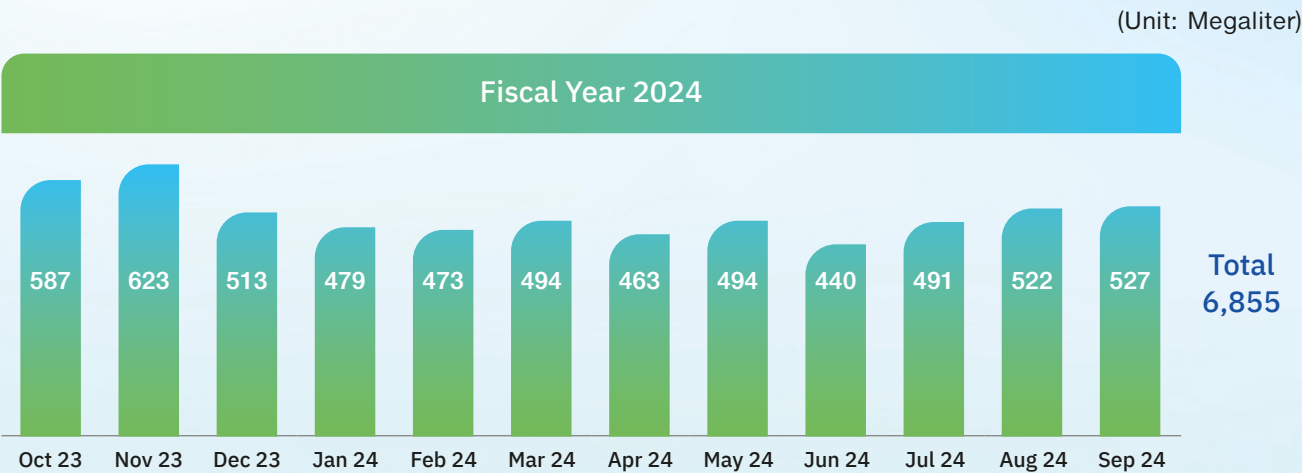


Table Showing Total Recycled Effluent for the Fiscal Years 2019-2024 of the Mahasawat Water Treatment Plant



Water Loss Management in the Water Distribution System

The MWA is committed to providing clean tap water services to over 12 million people living in Bangkok, Nonthaburi, and Samut Prakan areas to ensure that they have access to clean and safe tap water according to the criteria of the WHO and to ensure extensive consumption with 24-hour availability. Furthermore, we are ready to establish a secure tap water production network to comprehensively and sufficiently support urban expansion to enhance the security of the economy and society of Thailand by pushing for the completion of 9 projects by 2026. By following the MWA's main mission to deliver clean and safe tap water, the MWA has managed water loss and water pressure with a goal to reduce cumulative water loss to 26.00% by 2024.

To achieve our goal, we planned the replacement of old and worn water pipes that are approaching the end of their service life with new water pipes, and it is our goal to reduce water loss to only 23.00% by 2028, which is a more challenging target, through our water pipe renovation plans, proactive water loss management, and water pressure control and

management, including using technology to precisely identify pipe leaks and carrying out swift and effective maintenance.

- Pipe leak identification in the water distribution system by the use of satellite.
- Performance-based contracts to manage water loss in different areas (PBCs).

After replacing tap water pipes, in addition to ensuring that people have 24-hour access to clean and safe tap water, it enhances the local people's happiness through higher tap water pressure, the lack of need to suspend tap water supply in order to carry out pipe maintenance, and reduced traffic congestion during pipe maintenance activities. Moreover, the pipe replacements will help reduce the rate of breakage of tap water pipes, which causes large volumes of water to be wasted through leaks, thus conserving water resources and enhancing Thailand's natural resource security to ensure their extensive and adequate availability for use.

Performance in the Fiscal Years 2018-2024

Fiscal Year	Amount of Water Produced for Distribution (Megaliters)	Cumulative Rate of Water Loss (%)		Result of Damaged or Dilapidated Water Supply Pipe Renovation Target Performance Work (km)
		Target	Performance	
2018	1,997,100	28.75	29.83	407.110
2019	2,075,200	29.29	29.29	784.558
2020	2,121,100	27.29	31.25	1,002.424
2021	2,116,500	30.20	33.09	1,130.722
2022	2,080,300	30.50	31.64	1,210.368
2023	2,042,412	27.50	27.12	1,271.474
2024	2,038,133	26.00	25.68	1,304.100

Energy and Greenhouse Gas Emissions Management

Energy Use

The MWA prioritizes operations with consciousness about the environment and climate change and recognizes the importance of energy conservation. Therefore, the MWA has established an energy conservation policy to serve as a guideline for energy management, and a working group has been appointed to support the enterprise's eco-efficiency by operating under the Working Group on Strategic Sustainable Development and Integrated Economic Development (BCG Model). The group is responsible for collecting

and analyzing data to determine guidelines for measuring and evaluating eco-efficiency, managing energy, and driving plans or projects to reduce the organization's greenhouse gas (GHG) emissions.

In the fiscal year 2024, the MWA used a total of 433,456.88 megawatt hours (MWh), divided into electrical energy used in the water treatment and distribution process and in office buildings as follows:

Electricity Consumption of the MWA in the Fiscal Years 2022-2024

Fiscal Year	Electricity Consumption		
	Water Treatment and Distribution (MWh)	Office Buildings (MWh)	Total Electricity Consumption (MWh)
2024	414,489.41	18,967.47	433,456.88
2023	413,162.11	19,381.28	432,543.39
2022	435,894.85	18,568.62	454,463.48

Notes:

- The electricity consumption data is from the Eco-Efficiency Support Working Group, which is data calculated from electricity tariffs in the fiscal year from the SAP system, which has been certified by the Office of the Auditor General.
- Water treatment and distribution** means the water treatment system, transmission pumping system, distribution pumping system, and canal raw water pumping system.
Office buildings mean offices such as the head office building, the water transmission and distribution pumping system, office building (Samsen), the engineering building, the medical office building, the training center building, and all 18 MWA branch offices.

In the fiscal year 2024, solar panels have been installed at the head office area, with electricity consumption from the solar panel system totaling approximately 443,476 kWh. (Electricity amount from 27 March 2024 - 30 September 2024).

Fuel Consumption of the MWA

Fuel Type	Fiscal Year		
	2022	2023	2024
Diesel (liters)	572,833	624,509	571,903
Gasohol (liters)	179,322	116,068	108,981
NGV (kg)	6,744	4,323	1,078

Thermal Energy of Fuel and Electricity of the MWA (megajoules: MJ)

	Fiscal Year		
	2022	2023	2024
Electricity	1,636,068,512	1,557,156,193	1,560,444,772
Fuel	26,823,250	26,600,741	24,309,8560
Total Energy	1,662,891,761	1,583,756,934	1,584,754,632

- Notes:
- 1. Electrical thermal energy is calculated from electricity usage in the water treatment and distribution process and office buildings.
 - 2. Fuel thermal energy is calculated from NGV, gasohol, and diesel.
 - 3. Conversion of fuel and electricity values relies on heat values from the Department of Alternative Energy Development and Energy Conservation.

From the data on the amount of thermal energy from fuel and electricity of the MWA in the fiscal years 2022-2024, it was found that the intensity values of energy use per unit of production are as follows:

	Fiscal Year		
	2022	2023	2024
Energy consumption in treatment per volume of water sold (megajoules per cubic meter)	1.17	1.06	1.05

Greenhouse Gas Emissions

The MWA has collected data to assess the organization's greenhouse gas (GHG) emissions, applying the operational control approach. The current disclosure covers emissions from carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). However, it does not yet include emissions data for HFC, PFC, SF₆, and NF₃ due to data limitations. MWA is in the process of developing data collection procedures to enable the future assessment of all seven types of greenhouse gases. In the fiscal year 2024, MWA's operations resulted in total GHG emissions of 302,825.07 tons of carbon dioxide equivalent (tCO₂e), primarily from the consumption of various types of energy, as follows:

No.	Description	Greenhouse Gas Emissions (tonCO ₂ e)		
		Fiscal Year 2022	Fiscal Year 2023	Fiscal Year 2024
Category 1: Direct greenhouse gas emissions and absorption by the enterprise (Scope 1)				
Total Type 1		1,765	1,980	1,813
Type 2: Indirect greenhouse gas emissions from energy use (Scope 2)				
Including type 2		227,186	216,228	216,685
Category 3: Other indirect greenhouse gas emissions (Scope 3)				
Total type 3		65,609	74,581	84,327
Total Greenhouse Gas Emissions (tonCO ₂ e)		294,560	292,790	302,825

Notes:

- 1. Scope 1 greenhouse gas emissions are calculated from the use of NGV, gasohol, and diesel fuels in office buildings.
- 2. Scope 2 greenhouse gas emissions are calculated from electricity use in water treatment and distribution and office buildings.
- 3. Scope 3 greenhouse gas emissions are calculated from the use of chemicals in the water treatment process (lime, alum, chlorine, and PACI), chemical transportation, sediment transport for disposal, and paper use in office buildings.
- 4. The Global Warming Potential (GWP) uses the AR5 value and the emission factor from electricity production/use with reference to the Thailand Greenhouse Gas Management Organization (Public Organization).

From the data on greenhouse gas emissions arising from the enterprise’s activities in the fiscal years 2022-2024, the greenhouse gas emission intensity (GHG emission intensity) data is as follows:

	Fiscal Year		
	2022	2023	2024
Greenhouse gas emissions per volume of water sold (tonCO ₂ e per cubic meter)	0.000207	0.000197	0.000200

The average greenhouse gas emission intensity over 3 years is equal to 0.000201 tonCO₂e per cubic meter, with the trend of greenhouse gas emission intensity values over the past 3 years being relatively stable.

Reducing Energy Consumption and Greenhouse Gas Emissions

The MWA’s eco-efficiency analysis, which has established an environmental indicator as the carbon footprint for organization (CFO), found that a key activity generating significant greenhouse gas emissions is the use of electricity from external sources. The majority of this electricity consumption is generated by water transmission and distribution pumping systems. This is because water supply services within the MWA’s area of responsibility are provided through a network of water tunnels and closed-loop pressure pipes. Furthermore, the locations of water treatment plants, transmission pumping stations, and distribution pumping stations consist of large infrastructures that require 24-hour service. Therefore, improvements to the structure or management of water pressure and water volume cannot be implemented within a short period of time.

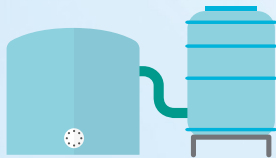
Thus, the MWA has established a short-term and long-term (the fiscal years 2025-2028) eco-efficiency improvement plan. It includes centralized vehicle management with sharing of travel routes, and replacement of rental cars with electric engines, along with energy conservation in office buildings, solar cell installation in buildings and the water treatment system, in addition to setting water pump operation measures in the transmission and distribution pumping systems to be appropriate with specified water pressures, and measures to reduce paper use, etc.

In the fiscal year 2024, the MWA has implemented a solar energy project by installing solar cells at the MWA headquarters, with a total installed capacity of 999.60 kWp, and has begun testing the system since 27 March 2024. The electricity produced from the solar cell system was measured from 27 March 2024 to 30 September 2024, the total electricity consumption reduction amounted to approximately 443,476 kWh (1,596,514 MJ), equivalent to an average monthly reduction of 71,173 kWh (256,223 MJ). This is considered a reduction in greenhouse gas emissions (CO₂) from the use of the solar panel system in Phase 1 of approximately 221,693 kgCO₂eq, or approximately 0.035 million kgCO₂eq/month (35,579 kgCO₂eq/month). Meanwhile, Phase 2 of the project, which consists of 13 branch offices of the MWA, 9 water distribution pumping stations, the Bang Khen Water Treatment Plant, the Samsen Water Treatment Plant, and the Mahasawat Water Treatment Plant, is expected to commence with installation starting in the fiscal year 2026.



Effluent and Waste

To respond to sustainable goals of the organization, we have established guidelines for effluent management in response to standards and in compliance with laws. These guidelines are used as a control framework for effluent generated by our operations. In general, effluent has been generated from two main sources as follows:



1. Effluent generated by water treatment processes

Most of them are generated by the processes of sedimentation and water filtration. The MWA collects and treats all effluent in the sediment removal system to meet the standards before being drained into public water sources. Moreover, samples of effluent are collected according to the frequency of drainage as required by law. The results from the laboratory are reported to relevant regulators on an ongoing basis.



2. Effluent generated by activities within office buildings:

The MWA collects and treats effluent in central effluent treatment systems or on-site effluent treatment systems to meet the standards as required. Effluent that may be contaminated with hazardous substances arising from the Water Quality Analysis Laboratory is collected and treated by the appropriate treatment method any further.

Total Effluent from the Four Water Treatment Plants (Megaliter)

Water Treatment Plant	Total Effluent (Fiscal Year)			Source to Receive Effluent ²	Types of Effluent	Results of Effluent Quality Analysis
	2022	2023	2024			
1. Bang Khen	30,577	31,791	29,175	Khlong Bang Talat	Fresh water ¹	Up to standard
2. Sam Sen	10,901	11,063	9,385	Khlong Sam Sen	Fresh water	Up to standard
3. Thon Buri	943	1,125	1,809	Khlong Bang Khun Non	Fresh water	Up to standard
4. Mahasawat	3,648	2,701	2,278	Khlong Plai Bang	Fresh water	Up to standard
Total	46,069	46,680	42,641			

Remarks:

- Freshwater refers to water with a TDS value of less than 1,000 mg/l.
- Source to receive effluent is a whole freshwater source, and it can be defined as the water stress area as shown in the photo on page 97.
- The laws related to the MWA's wastewater and discarded water are as follows:
 - The Ministry of Natural Resources and Environment Announcement on Setting Control Standards for Wastewater from Industrial Factories, Industrial Estates, and Industrial Zones issued on 29 March 2016.
 - The Ministry of Industry Announcement on Setting Control Standards for Wastewater from Factories issued on 30 May 2017.
 - Ministerial Regulation on Specifying the Criteria, Procedures, and Formats for Compilation of Statistics and Data and Information Recording and Summary Reports on Wastewater Treatment System Performance, B.E. 2555 (2012), issued on 3 April 2012.

Waste

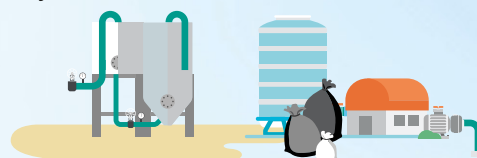
The Metropolitan Waterworks Authority has classified waste generated within the organization into 2 types, namely:

1. Effluent generated by water production processes:

It is a soil sludge generated by water production processes, managed as required by law [Notification of the Ministry of Industry on the Disposal of Sewage or Disused Materials, B.E. 2545 (2005), enacted on 27 December 2005, stipulating in the Gazette, page 14, volume 123, special section 11, dated 25 January 2006].

2. Solid waste generated by activities within office buildings:

It is a solid waste that occurs in MWA headquarters and its branches. This includes the four water treatment plants, managed in accordance with government policy.



Management Guidelines for Effluent Generated by Water Production Processes

In general, effluent is generated by water production processes mainly arising from the processes of sludge drainage and pond flushing after being treated with a sludge removal system. Due to certain limitations of our effluent treatment systems by both natural and mechanical methods, large quantities of sludge remain

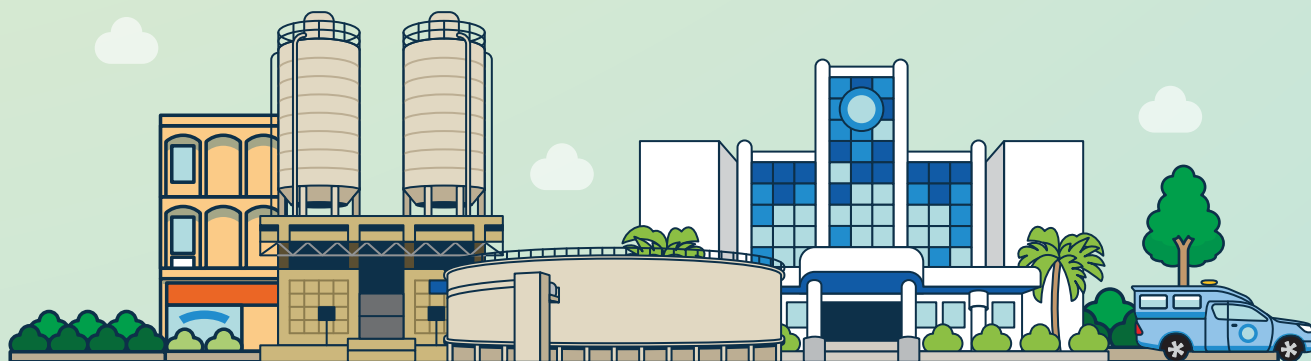
in the system. Once that sludge has been examined in the laboratory, there are no contaminants that significantly affect the environment. Thus, the MWA has hired contractors to collect those waste and proceed its disposal using landfill methods as required by laws.

Total Sludge Generated by Water Production Processes

Water Treatment Plant	Total Sludge (Unit: ton)				Fiscal Year 2024	
	2021	2022	2023	2024	Waste Disposal Site	Meet the Standards
1. Bang Khen	55,557	74,370	67,600	75,861	Title Deed No. 44655, Nong Suea District, Pathum Thani Province, Ms. Sonthaya Chaichana (Method of disposal: 082, filling in low-lying areas)	Pass
2. Sam Sen	3,904	6,934	7,293	5,148.61	Title Deed No. 11879, Naraphirom Sub-district (Khlomg Naraphirom), Bang Len District (Bang Pla), Nakhon Pathom Province, owned by Mr. Anuwat Kaewduangkae (Method of disposal: 082, filling in low-lying areas)	Pass
3. Thon Buri	1,691	2,315	2,452	2,700.44	Title Deed No. 120923, Bang Krang Sub-district, Muang Nonthaburi District, Nonthaburi Province, owned by Mr. Anuwat Kaewduangkae (Method of disposal: 082, filling in low-lying areas)	Pass
4. Mahasawat	20,494	6,935	18,893	19,473.26	Title Deed No. 5736, Book No. 58, Page 36, Nakhon Chai Si District, Nakhon Pathom Province, owned by Mrs. Janphen Choknakavaro (Method of disposal: 082, filling in low-lying areas)	Pass



MWA Performance



Key Marketing Performance



Total water production (million m³)

2022	2023	2024
2,080.3	2,042.4	2,038.1



Total water distribution (million m³)

2022	2023	2024
1,422.2	1,488.6	1,514.8



Total number of customers at fiscal year-end (connections)

2022	2023	2024
2,558,418	2,606,167	2,644,177



Total number of new customers (connections)

2022	2023	2024
62,379	66,408	56,512



Total populations in service area at fiscal year-end (persons)

2022	2023	2024
8,151,075	8,152,650	8,153,765

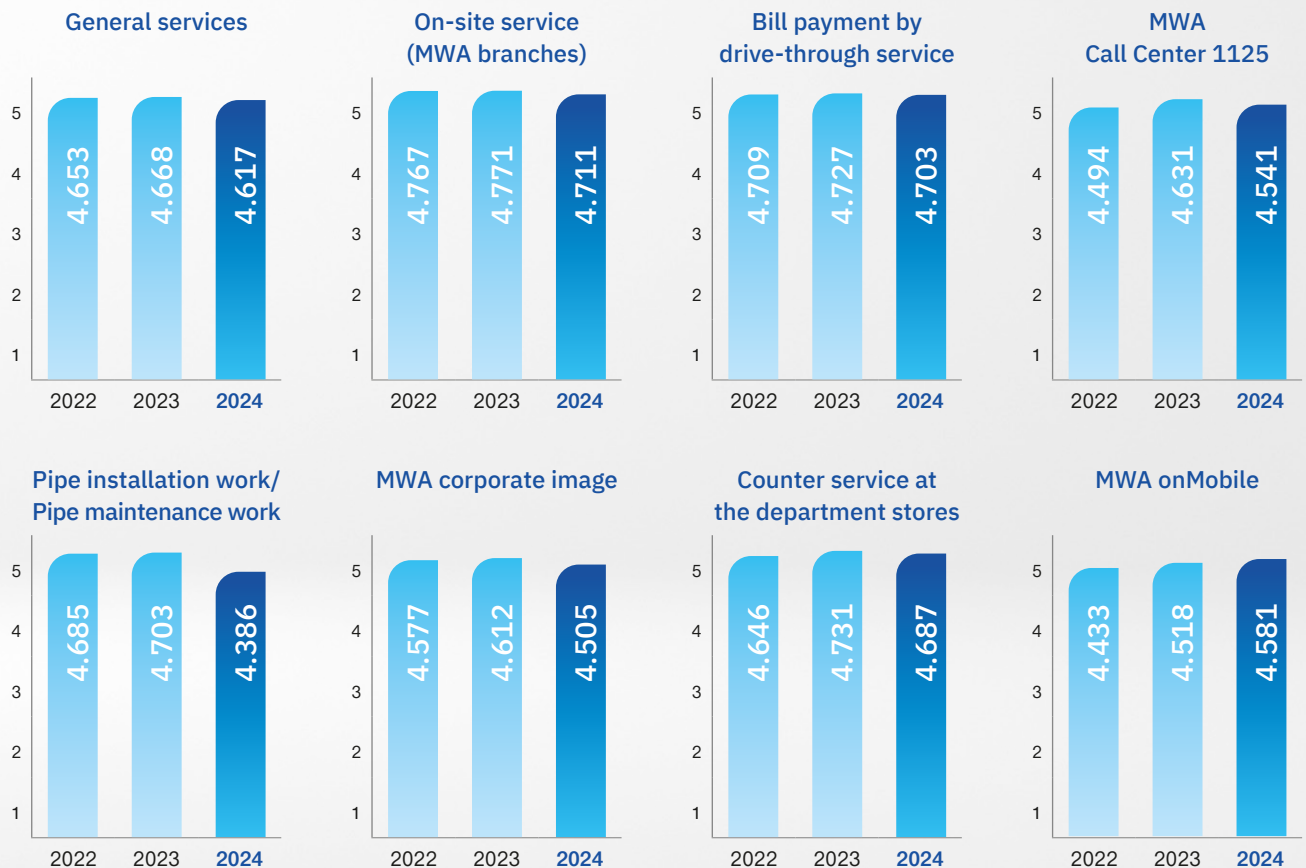


Total households in service area at fiscal year-end (connections)

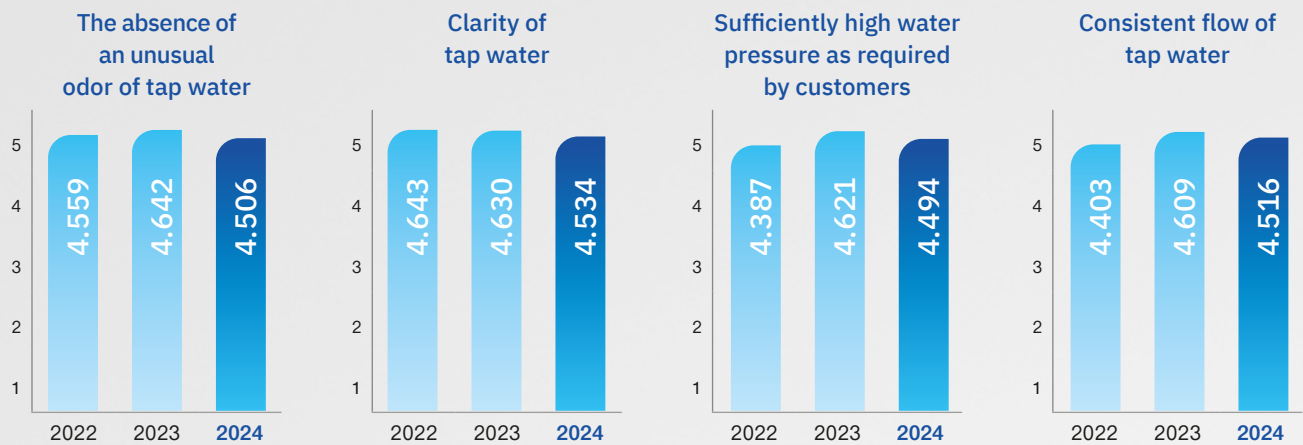
2022	2023	2024
4,688,136	4,776,463	4,855,913

Key Customer Performance Results

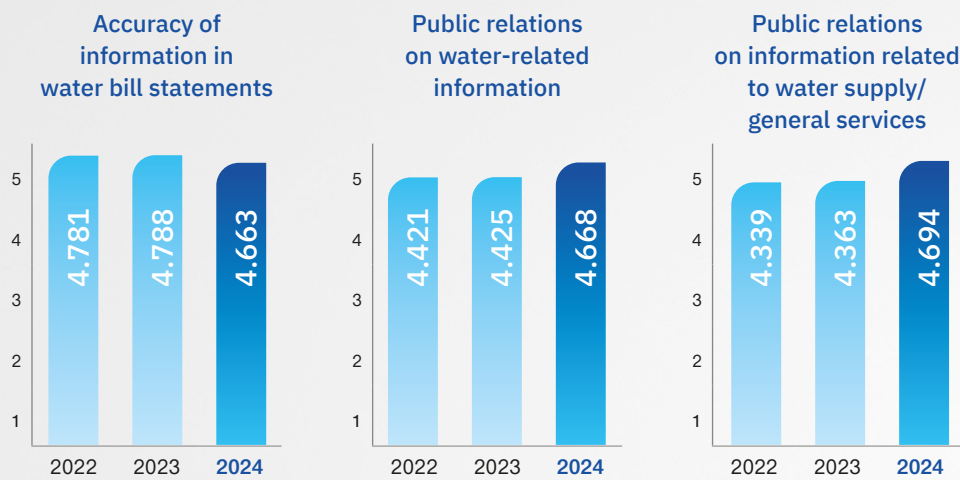
Satisfaction with General Services (Out of 5 Points)



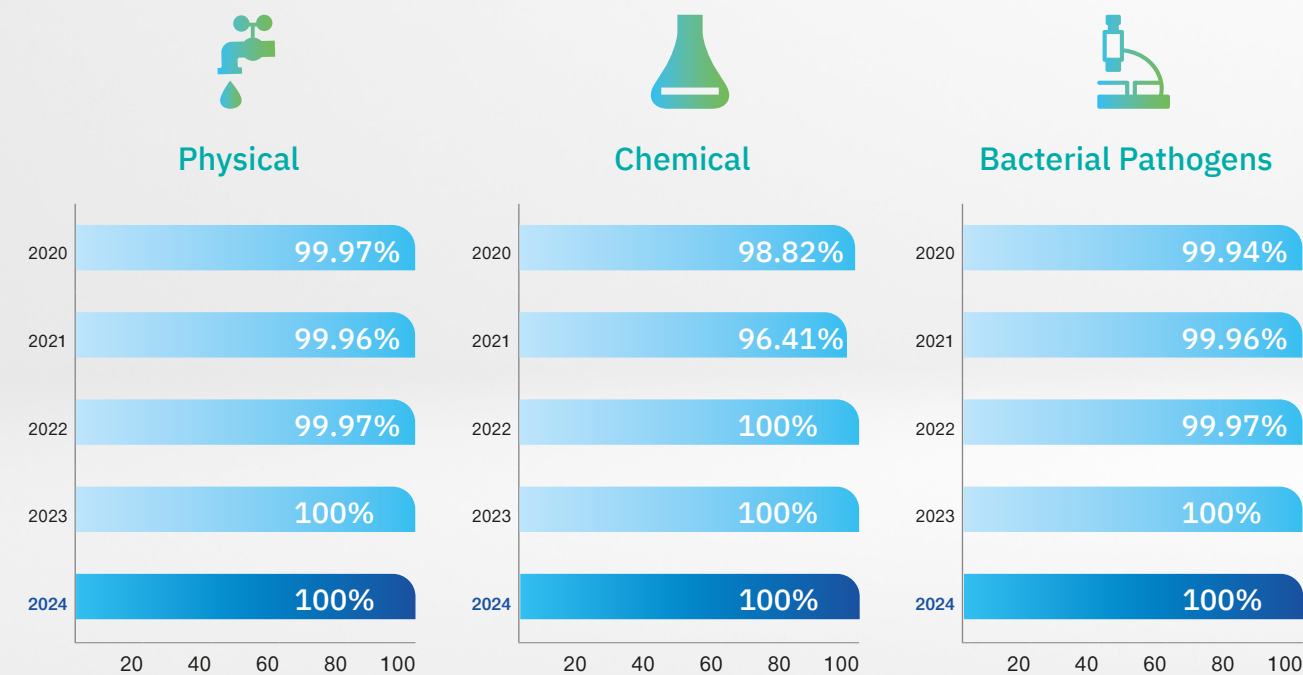
Satisfaction with Product Quality (Tap Water) (Out of 5 Points)



Satisfaction with Information and News of the MWA (Out of 5 points)

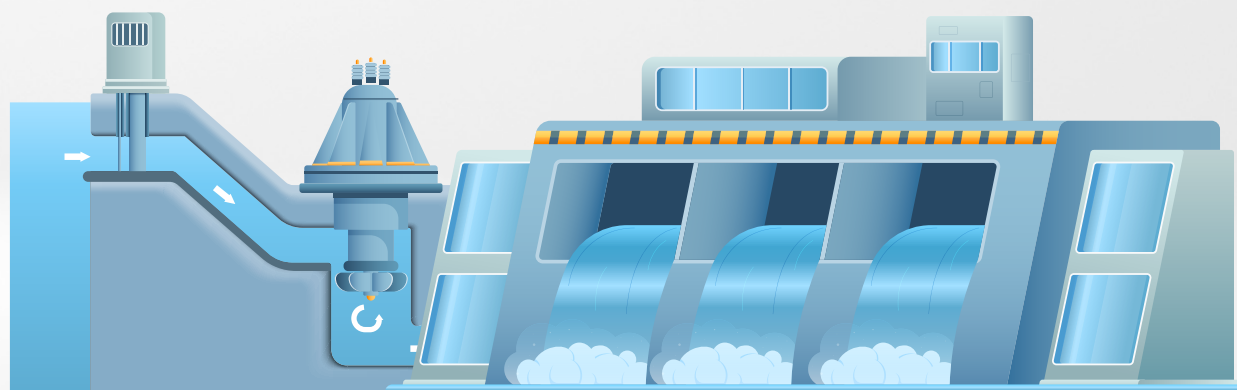


Key Performance in Product Operations (Tap Water Quality)



● Key Performance in Water Production and Distribution

	Fiscal Year			
	2021	2022	2023	2024
Total number of samples from water distribution system used for water quality analysis	2,702	3,504	3,061	3,576
E. coli	99.97	99.97	100	100
Target Value	Zero E. coli			
Turbidity (unit: NTU)	0.30	0.33	0.25	0.34
Target Value	No more than 1.0			
pH	7.35	7.24	7.36	7.24
Target Value	6.5-8.5			
Free Residual Chlorine (unit: mg/L)	0.78	0.71	0.68	0.67
Target Value	More than 0.2			
Quality of Tap Water: Physical	99.96	99.97	100	100
Target Value	100	100	100	100
Quality of Tap Water: Chemical	96.41	100	100	100
Target Value	100	100	100	100
Quality of Tap Water: Bacterial Pathogens	99.96	99.97	100	100
Target Value	99.97	99.97	100	100



Financial Information

Financial Information	2021	2022	2023	2024
Total assets (Million baht)	84,158.8	87,211.4	90,224.1	93,470.4
Current assets	10,356.4	11,431.1	13,315.7	13,503.2
Non-current assets	73,802.4	75,780.3	76,908.4	79,967.2
Total liabilities (Million baht)	16,761.1	17,683.0	18,982.9	19,616.5
Current liabilities	4,369.1	5,303.4	5,876.3	6,002.4
Non-current liabilities	12,392.0	12,379.6	13,106.6	13,614.1
Total equity (Million baht)	67,397.7	69,528.4	71,241.2	73,853.9
Total revenues (Million baht)	18,435.6	18,490.4	19,459.1	20,780.0
Operating revenue	18,061.1	18,067.4	19,043.2	20,038.7
Revenue from water sales and water equipment fees	16,895.4	16,837.8	17,706.7	18,654.5
Revenue from new connection fees	278.5	308.9	324.2	327.9
Other operating income	887.2	920.7	1,012.3	1,056.3
Non-operating Revenues	374.5	423.0	415.9	741.3
Total expenses (Million baht)	13,600.3	14,380.0	15,598.6	15,653.5
Operating expenses	13,574.7	14,375.3	15,569.9	15,587.6
Direct operating expenses	8,339.3	8,840.2	9,914.9	9,639.0
Depreciation and amortization	5,210.6	5,515.3	5,639.9	5,937.1
Interest expense and loan fee	24.8	19.8	15.1	11.5
Non-operating expenses	25.6	4.7	28.7	65.9
Other expenses	25.6	4.7	28.7	65.9
(Profit) Loss from foreign exchange rate	-	-	-	-
Net profit (Million baht)	4,835.3	4,110.4	3,860.5	5,126.5
Return on assets (Percent)	5.75	4.71	4.28	5.48
Return on equity (Percent)	7.17	5.91	5.42	6.94
Net profit margin (Percent)	26.77	22.75	20.27	25.58
Asset turnover (Times)	0.21	0.21	0.21	0.21
Current ratio (Times)	2.37	2.16	2.27	2.25
Debt to total assets ratio (Times)	0.20	0.20	0.21	0.21
Debt to equity ratio (Times)	0.25	0.25	0.27	0.27
Cost of water sales per m ³ (Baht)	9.48	10.07	10.47	10.19

General Information

General Information	2021	2022	2023	2024
Total amount of water production (Million m³)	2,116.5	2,080.3	2,042.4	2,038.1
Bang Khen Water Treatment Plant	1,427.6	1,394.0	1,386.4	1,381.5
Sam Sen Water Treatment Plant	92.2	86.4	87.3	88.8
Thon Buri Water Treatment Plant	40.1	39.9	40.4	38.5
Mahasawat Water Treatment Plant	556.6	560.0	528.3	529.3
Total amount of water distribution (Million m³)	1,416.2	1,422.2	1,488.6	1,514.8
Residences	705.8	695.6	715.6	788.3
Business, state enterprises, government agencies, and others	643.2	640.5	679.6	650.5
Public water and others	67.2	86.1	93.4	76.0
Percentage of water distribution (Percent)	66.91	68.36	72.88	74.32
Number of consumers at the end of the year (Connections)	2,517,486	2,558,418	2,606,167	2,644,177
Residence	2,062,299	2,109,493	2,155,257	2,191,070
Business, state enterprises, government agencies, and others	455,187	448,925	450,910	453,107
Small consumers (Connections)	2,482,886	2,523,957	2,571,637	2,609,595
Water meter size 1/2 inch	1,613,975	1,658,198	1,707,664	1,747,254
Water meter size 3/4 inch	798,621	795,051	792,845	790,916
Water meter size 1 inch	70,290	70,708	71,128	71,425
Key consumers (Connections)	34,600	34,461	34,530	34,582
Water meter size 1½ inches	15,366	15,596	15,951	16,125
Water meter size 2 inches	12,405	12,235	12,200	12,116
Water meter size over 2 inches	6,829	6,630	6,379	6,341
Number of new connections (Connections)	60,241	62,379	66,408	56,512
Average amount of water consumption per month (m³)	44.99	43.86	44.99	45.62
Residences	28.86	27.78	27.94	30.17
Business, state enterprises, government agencies, and others	116.38	118.05	125.95	120.35
Average water tariff per m³ (Baht)	11.31	11.69	11.81	12.1
Residences	9.40	9.85	9.94	10.27
Business, state enterprises, government agencies, and others	13.42	13.69	13.78	14.31
Total number of personnel (Persons)	5,314	5,272	5,175	5,089
Number of employees at the end of the year	4,250	4,252	4,154	4,059
Number of contract workers	1,064	1,020	1,021	1,030
Ratio of consumers per personnel (Connections)	474	485	504	520
Population in responsible area at the end of the year (Persons)	8,173,080	8,151,075	8,152,650	8,153,765
Number of households in responsible are at the end of the year (Houses)	4,609,369	4,688,136	4,776,463	4,855,913

GRI CONTENT INDEX

Statement of use	Metropolitan Waterworks Authority (MWA) of Thailand has reported in accordance with GRI Standards for the period 1 October 2023 to 30 September 2024.
GRI 1 used	GRI: Foundation 2021
Applicable GRI Sector Standard (s)	-

GRI STANDARD/ OTHER SOURCE	DISCLOSURE		LOCATION (Page)	OMISSION			GRI SECTOR STANDARD REF. NO.
				REQUIREMENT(S) OMITTER	REASON	EXPLANATION	
General Disclosure							
GRI 2: General Disclosures 2021	The organization and its reporting practices						
	2-1	Organizational details	12-17				
	2-2	Entities included in the organization's sustainability reporting	12-13				
	2-3	Reporting period, frequency and contact point	8, 10				
	2-4	Restatements of information	No restatement				
	2-5	External assurance	117-120				
	Activities and workers						
	2-6	Activities, value chain and other business relationships	12, 17, 19				
	2-7	Employees	14				
	2-8	Workers who are not employees	14				
	Governance						
	2-9	Governance structure and composition	35				
	2-10	Nomination and selection of the highest governance body	36				
	2-11	Chair of the highest governance body	35				
	2-12	Role of the highest governance body in overseeing the management of impacts	37				
	2-13	Delegation of responsibility for managing impacts	38				
	2-14	Role of the highest governance body in sustainability reporting	38				
	2-15	Conflicts of interest	43				
	2-16	Communication of critical concerns	8				
	2-17	Collective knowledge of the highest governance body	40				
2-18	Evaluation of the performance of the highest governance body	39-40					

GRI STANDARD/ OTHER SOURCE	DISCLOSURE		LOCATION (Page)	OMISSION			GRI SECTOR STANDARD REF. NO.
				REQUIREMENT(S) OMITTER	REASON	EXPLANATION	
GRI 2: General Disclosures 2021	2-19	Remuneration policies	41				
	2-20	Process to determine remuneration	41				
	2-21	Annual total compensation ratio	n/a	a, b, c	Confidentiality	Board Committee Compensation is confidential.	
	Strategy, policies and practices						
	2-22	Statement on sustainable development strategy	6-7				
	2-23	Policy commitments	22-24				
	2-24	Embedding policy commitments	22-24				
	2-25	Processes to remediate negative impacts	49-50				
	2-26	Mechanisms for seeking advice and raising concerns	49-50				
	2-27	Compliance with laws and regulations	22-23				
	2-28	Membership associations	59-61				
	Stakeholder engagement						
	2-29	Approach to stakeholder engagement	49-50				
	2-30	Collective bargaining agreements	90				
Material Topics							
GRI 3: Material Topics 2021	3-1	Process to determine material topics	8				
	3-2	List of material topics	9-10				
Anti-corruption							
GRI 3: Material Topics 2021	3-3	Management of material topics	34, 42				
GRI 205: Anti-corruption 2016	205-1	Operations assessed for risks related to corruption	43-44				
	205-2	Communication and training about anti-corruption policies and procedures	45-46				
	205-3	Confirmed incidents of corruption and actions taken	47				
Energy							
GRI 3: Material Topics 2021	3-3	Management of material topics	101				
GRI 302: Energy 2016	302-1	Energy consumption within the organization	101				
	302-2	Energy consumption outside of the organization	No energy consumption outside the organization				
	302-3	Energy intensity	102				

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION (Page)	OMISSION			GRI SECTOR STANDARD REF. NO.
			REQUIREMENT(S) OMITTER	REASON	EXPLANATION	
GRI 302: Energy 2016	302-4 Reduction of energy consumption	103				
	302-5 Reductions in energy requirements of products and services	n/a			The organization does not have direct influence over customers' energy consumption in water use.	
Water and Effluents						
GRI 3: Material Topics 2021	3-3 Management of material topics	96-99				
	303-1 Interactions with water as a shared resource	97-98				
	303-2 Management of water discharge-related impacts	104				
GRI 303: Water and Effluents 2018	303-3 Water withdrawal	96				
	303-4 Water discharge	104				
	303-5 Water consumption	98				
Emissions						
GRI 3: Material Topics 2021	3-3 Management of material topics	102-103				
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	102				
	305-2 Energy indirect (Scope 2) GHG emissions	102				
	305-3 Other indirect (Scope 3) GHG emissions	102				
	305-4 GHG emissions intensity	103				
	305-5 Reduction of GHG emissions	103				
	305-6 Emissions of ozone-depleting substances (ODS)	n/a	a, b, c, d		Data collection in progress	
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	n/a	a, b, c		No activities generating NOx and SOx	
Waste						
GRI 3: Material Topics 2021	3-3 Management of material topics	105				
	306-1 Waste generation and significant waste-related impacts	105				
	306-2 Management of significant waste-related impacts	105				
GRI 306: Effluents and Waste 2016	306-3 Waste generated	n/a	a		Data collection in progress	
	306-4 Waste diverted from disposal	n/a	a, b, c		Data collection in progress	
	306-5 Waste directed to disposal	105				

GRI STANDARD/ OTHER SOURCE	DISCLOSURE		LOCATION (Page)	OMISSION			GRI SECTOR STANDARD REF. NO.
				REQUIREMENT(S) OMITTER	REASON	EXPLANATION	
Occupational Health and Safety							
GRI 3: Material Topics 2021	3-3	Management of material topics	80				
	403-1	Occupational health and safety management system	80-82				
	403-2	Hazard identification, risk assessment, and incident investigation	83				
	403-3	Occupational health services	86				
	403-4	Worker participation, consultation, and communication on occupational health and safety	81, 84				
	403-5	Worker training on occupational health and safety	85				
	403-6	Promotion of worker health	86				
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	82-83				
GRI 403: Occupational Health and Safety 2018	403-8	Workers covered by an occupational health and safety management system	83				
	403-9	Work-related injuries	85				
	403-10	Work-related ill health	86				
Training and Education							
GRI 3: Material Topics 2021	3-3	Management of material topics	70				
GRI 404: Training and Education 2016	404-1	Average hours of training per year per employee	73				
	404-2	Programs for upgrading employee skills and transition assistance programs	70-73				
	404-3	Percentage of employees receiving regular performance and career development reviews	74-75				
Local Communities							
GRI 3: Material Topics 2021	3-3	Management of material topics	91				
GRI 413: Local Communities 2016	413-1	Operations with local community engagement, impact assessments, and development programs	91				
	413-2	Operations with significant actual and potential negative impacts on local communities	91-93				

GRI STANDARD/ OTHER SOURCE	DISCLOSURE		LOCATION (Page)	OMISSION			GRI SECTOR STANDARD REF. NO.
				REQUIREMENT(S) OMITTER	REASON	EXPLANATION	
Customer Health and Safety							
GRI 3: Material Topics 2021	3-3	Management of material topics	76-77				
GRI 416: Customer Health and Safety 2016	416-1	Assessment of the health and safety impacts of product and service categories	78-79				
	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	79				
Non-GRI Topics							
Effective Communication							
GRI 3: Material Topics 2021	3-3	Management of material topics	49-50				
Business Continuity Management							
GRI 3: Material Topics 2021	3-3	Management of material topics	51				
Innovation and Digitalization							
GRI 3: Material Topics 2021	3-3	Management of material topics	52-58				
Partnership and Collaboration							
GRI 3: Material Topics 2021	3-3	Management of material topics	59-61				
Internal Control Efficiency							
GRI 3: Material Topics 2021	3-3	Management of material topics	62-65				
Accessible and Affordable Services and Product							
GRI 3: Material Topics 2021	3-3	Management of material topics	66-67				
Non-Discrimination and Equal Opportunity							
GRI 3: Material Topics 2021	3-3	Management of material topics	89				
Welfare and Stability							
GRI 3: Material Topics 2021	3-3	Management of material topics	89-90				

INDEPENDENT ASSURANCE OPINION STATEMENT

2024 – Metropolitan Waterworks Authority – Sustainability Report

The British Standards Institution is independent to Metropolitan Waterworks Authority (hereafter referred to as MWA in this statement) and has no financial interest in the operation of Metropolitan Waterworks Authority other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of Metropolitan Waterworks Authority only for the purpose of verifying its statements relating to its environmental, social and governance (ESG), more particularly described in the Scope, below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by Metropolitan Waterworks Authority. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to Metropolitan Waterworks Authority, only.

Scope

The scope of engagement agreed upon with Metropolitan Waterworks Authority includes the following:

- 1) The assurance covers the whole report and focuses on systems and activities during the 2024 fiscal year (1 October 2023 – 30 September 2024) at Metropolitan Waterworks Authority with the following materiality:
 - GRI 302: Energy 2016
 - GRI 303: Water and Effluents 2018
 - GRI 305: Emissions 2016
 - GRI 403: Occupational Health and Safety 2018

However, GRI 302-5 and GRI 305-7 were subsequently excluded from the assurance as they are not applicable to the Metropolitan Waterworks Authority, while GRI 302-2 and GRI 305-6 were excluded due to the unavailability of complete and verifiable data during the assurance period.

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The evaluation of the nature and extent of Metropolitan Waterworks Authority's adherence to all four AA1000 AccountAbility Principles and the reliability of specified sustainability performance information in this report as conducted in accordance with type 2 of AA1000AS v3 sustainability assurance engagement.

Opinion Statement

We conclude, that the Sustainability Report Review provides a fair view of Sustainability report programmes and performances during 2024. We believe that the Sustainability report economic, social and environment performance indicators are accurate and are supported by robust internal verification processes.

Based on our work described in the verification report, nothing has come to our attention that causes us to believe that data and information stated in the Reporting Organization's Sustainability Report is not correctly presented or with omission, in any material respects or that Inclusivity, Materiality Responsiveness and Impact based on AA1000 criteria are not correctly addressed.

Our work was carried out by a team of sustainability report assurers in accordance with the AA1000 Assurance Standard v3. We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that Metropolitan Waterworks Authority's description of their approach to AA1000 Assurance Standard and their statement that the Sustainability Report has been prepared in accordance with the GRI Standards, were fairly stated.

Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- a top level review of issues raised by external parties that could be relevant to Metropolitan Waterworks Authority's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers and staffs on Metropolitan Waterworks Authority's approach to stakeholder engagement. However, we had no direct contact with external stakeholders.
- interviews with staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the findings of internal audits.
- review of supporting evidence for claims made in the reports.
- an assessment of the company's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness and Impact as described in the AA1000 AccountAbility Principles Standard (2018).

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Conclusions

A detailed review against the AA1000 AccountAbility Principles of Inclusivity, Materiality, Responsiveness and Impact and the GRI Standards is set out below:

Inclusivity

This report has reflected a fact that Metropolitan Waterworks Authority is seeking the engagement of its stakeholders. The participation of stakeholders has been initiated in developing and achieving an accountable and strategic response to sustainability. The reporting systems are being developed to deliver the required information. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers Metropolitan Waterworks Authority's inclusivity issues.

Materiality

Metropolitan Waterworks Authority publishes sustainability information that enables its stakeholders to make informed judgments about the company's management and performance. In our professional opinion the report covers the Metropolitan Waterworks Authority's material issues, however, the future report should be further enhanced by the following areas:

- Expanding the data collection to cover all seven greenhouse gases identified under the Kyoto Protocol (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, and NF₃) to enhance completeness and alignment with best practices in GHG reporting.

Responsiveness

Metropolitan Waterworks Authority has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for Metropolitan Waterworks Authority is developed and provides the opportunity to further enhance Metropolitan Waterworks Authority's responsiveness to stakeholder concerns. In our professional opinion the report covers the Metropolitan Waterworks Authority's responsiveness issues.

Impact

Metropolitan Waterworks Authority has demonstrated a process on identify impacts that encompass a range of environmental, social and governance topics, and fairly represented the impacts in the report. In our professional opinion the report covers the Metropolitan Waterworks Authority's impacts.

GRI-reporting

Metropolitan Waterworks Authority provided us with their self-declaration of compliance within GRI Standards (Comprehensive). Based on our review, we confirm that social responsibility and sustainable development indicators in accordance with the GRI Index are

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reported, partially reported or omitted. In our professional opinion the self-declaration covers the Metropolitan Waterworks Authority's social responsibility and sustainability issues.

Assurance level

The moderate level assurance provided is in accordance with AA1000 Assurance Standard v3 in our review, as defined by the scope and methodology described in this statement.

Responsibility

This Sustainability Report is the responsibility of the Director of Social Responsibility Management Department of Metropolitan Waterworks Authority, as declared in her responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

Competency and Independence

The assurance team was composed of Lead Auditors and Carbon Footprint Verifiers experienced in industrial sector, and trained in a range of sustainability, environmental and social standards including AA1000 AS, GRI, ISO14001, ISO14064-1, ISO20400 and experience on the SRA Assurance service provisions. BSI is a leading global standards and assessment body founded in 1901.

For and on behalf of BSI:

Parnuwat Usapein

Parnuwat Usapein, Lead Assurer



For and on behalf of BSI:

Kuldhaj Bunbongkarn, Managing Director Assurance, Thailand



AA1000
Licensed Assurance Provider
000-4

Statement No: SRA 834006
2025-09-17

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Appendix A:

GRI 302: Energy 2016

- 302-1 Energy consumption within the organization
- 302-3 Energy intensity
- 302-4 Reduction of energy consumption

GRI 303: Water and Effluents 2018

- 303-1 Interactions with water as a shared resource
- 303-2 Management of water discharge-related impacts
- 303-3 Water withdrawal
- 303-4 Water discharge
- 303-5 Water consumption

GRI 305: Emissions 2016

- 305-1 Direct (Scope 1) GHG emissions
- 305-2 Energy indirect (Scope 2) GHG emissions
- 305-3 Other indirect (Scope 3) GHG emissions
- 305-4 GHG emissions intensity
- 305-5 Reduction of GHG emissions

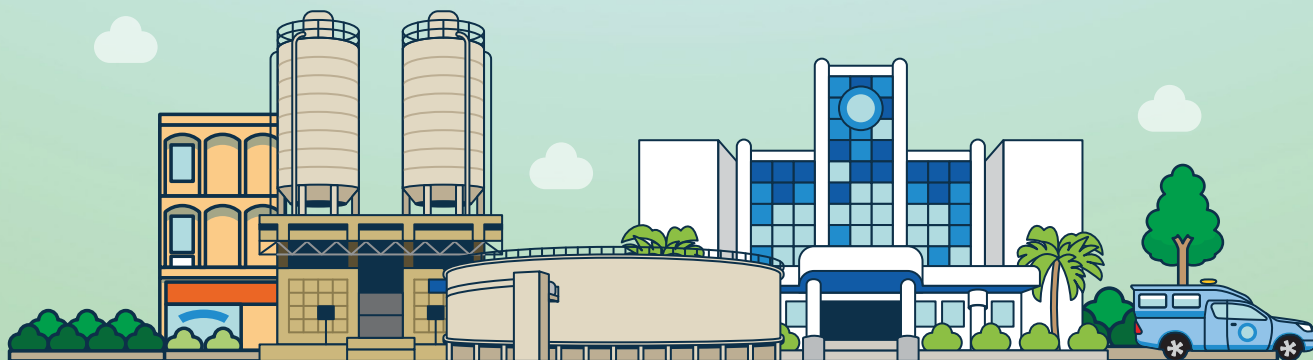
GRI 403: Occupational Health and Safety 2018

- 403-1 Occupational health and safety management system
- 403-2 Hazard identification, risk assessment, and incident investigation
- 403-3 Occupational health services
- 403-4 Worker participation, consultation, and communication on occupational health and safety
- 403-5 Worker training on occupational health and safety
- 403-6 Promotion of worker health
- 403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships
- 403-8 Workers covered by an occupational health and safety management system
- 403-9 Work-related injuries
- 403-10 Work-related ill health





Survey on Satisfaction
towards MWA Sustainability
Report 2024





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Sustainability
Report
2024