

VOLUME

01

2025

# SWIMMING POOL MANAGEMENT HANDBOOK



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For more information about the Swimming Pool and Related Facilities Management, please contact: **[ppfkra.member@gmail.com](mailto:ppfkra.member@gmail.com)**, or call **+6016 7722 775**.



# JOIN US IN ADVANCING EXCELLENCE!



PPFKRA invites all stakeholders in the swimming pool and water recreation sector to unite in this transformative journey. Together, we can create a future where every water recreation experience is not only enjoyable but also safe, sustainable, and enriching for the well-being of our community.



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**Foreword by**  
**Ketua Pengarah**  
**(Director - General)**  
**Jabatan Kerajaan Tempatan (JKT)**  
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**Kementerian Perumahan Dan Kerajaan Tempatan**  
**(Ministry of Housing & Local Government)**

Kementerian Perumahan Dan Kerajaan Tempatan (KPKT) has issued Circular No. 1/2019 by the Secretary-General of KPKT, which outlines the Guidelines for the Management and Maintenance of Public Swimming Pools in Local Authority Areas (PBT), and circular No. 2/2019 concerning for Monitoring Swimming Pool Water Quality in Local Authority Areas (PBT), issued on 11 March 2019. These guidelines were developed in accordance with the resolution made during Mesyuarat Majlis Negara Bagi Kerajaan Tempatan Ke-73 (MNKT) held on 15 February 2019.

The guidelines comprehensively address various aspects of swimming pool management, including the preparation of safety plans, cleaning and maintenance programmes, and water quality monitoring. Beginning in 2020, Jabatan Kerajaan Tempatan (JKT) has played an instrumental role in promoting these guidelines within both public and private sectors. In doing so, JKT has collaborated with the Persatuan Pengurusan Fasiliti Kolam dan Rekreasi Air (PPFKRA) to disseminate the guidelines and to conduct training for personnel tasked with their implementation. To facilitate broader understanding and adoption, PPFKRA has taken the initiative to develop this handbook, with full support of JKT.

As Chairman of the Engineering, Safety, and Risk Assessment Working Committee under the Water Activities Safety Council (MKAA), I am wholly committed to safeguarding public safety in all aquatic activities. PPFKRA, as an active committee member, has successfully translated these strategies into practice, as reflected in this handbook. I am confident that all stakeholders involved in the swimming pool industry will benefit from this resource. However, it is important to emphasize that this handbook must be read in conjunction with the official KPKT guidelines to ensure that implementation meets the intended objectives.

Finally, I wish to extend my heartfelt congratulations to Bahagian Perunding Kejuruteraan Kesihatan Umum, JKT and to PPFKRA for their collaboration effort in developing this handbook. It is my hope that such partnerships will continue to flourish in the future.

**Dato' Mohd Fadzli bin Mohd Kenali**  
**Ketua Pengarah**  
**(Director - General)**



**Foreword by  
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Since the KPKT guidelines were published in 2019, Local Government Departments via Public Health Engineering Consultancy Division have implemented many programs to promote the application of these guidelines at Local Authorities or to the private sector. Among others are online courses for Local Authorities in 2020 and physical training for Local Authorities in 2021 and 2022. The awareness has also been extended to private sectors such as Malaysian Association of Hotel (MAH) circa 2022. Due to the limited resources to conduct the awareness program, Dr. Kelvin Liaw personally has approached to collaborate with LGD to have the training for Local Authorities and private sector ie. property developer, hotel owner, pool contractor and pool workers.

In 2023, the collaboration extended into the establishment of PPFKRA, a new entity specializing for promoting the pool industry as well as training arm for KPKT. PPFKRA also has been appointed as members of the Engineering, Safety and Risk Assessment Working Committee, Water Activities Safety Council (MKAA) in 2024. Since then, PPFKRA and JKT have worked together for any program related to pool management and industry. This handbook is one of the tools that PPFKRA created to help either public, private sectors or whoever is involved in the pool industry in managing their pools. The content in this handbook specifically made to make everyone ease in usage and implement it at their own property.

Finally yet importantly, this handbook, I believe is not the only one product from PPFKRA but many more will come from PPFKRA to help the Government in make sure everyone who uses the pool is safe and ensure the pool facility is optimum at all times and in compliance with current regulations and guidelines.

May all the readers benefit from this handbook and make positive changes to the pool industry.

**Mohamed Yazid bin Kuman  
Pengarah  
(Director)**



**Foreword by  
President,  
Persatuan Pengurusan Fasiliti Kolam & Rekreasi Air  
(Association of Pool & Water Recreation Facility  
Management)**

As President of PPFKRA, I am proud to announce the publication of the first volume of our Swimming Pool Management Handbook. This handbook represents a significant milestone in our commitment to elevating industry standards and promoting best practices in swimming pool management.

Designed as a comprehensive resource, the handbook provides valuable insights and guidance tailored for pool managers, staff, and professionals of all experience levels. In an era where efficiency and compliance are paramount, effective pool management is critical to ensure safety, hygiene, and adherence to regulatory standards.

This publication consolidates expertise from industry leaders, offering practical strategies to address common challenges. Key topics include maintenance, water quality management, safety protocols, and regulatory compliance. By empowering professionals with actionable knowledge, we aim to enhance operational excellence, improve safety outcomes, and extend the lifespan of pool facilities.

I would like to express my sincere gratitude to all contributors whose knowledge and dedication made this handbook possible. Your efforts exemplify the commitment to advancing the industry. Additionally, I extend my appreciation to the supporters of PPFKRA's initiatives.

It is my hope that this handbook becomes an indispensable tool for daily operations, driving continuous improvement across the industry. Together, we can achieve higher standards in swimming pool management and create safer, more sustainable facilities for future generations.

Finally, I would like to express my highest appreciation to the Jabatan Kerajaan Tempatan (JKT), Kementerian Perumahan Dan Kerajaan Tempatan (KPKT), for their invaluable support and advice in the development of this handbook.

**Dr. Kelvin Liaw**  
DBA (PM) ChFM MPWTAG MISPE  
ISO 9001 & 41001 Lead Auditor  
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Accredited HRD Corp Trainer

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# The **Smart Way** to **Manage Your Pool**

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# Swimming Pool Management Handbook Volume 01

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## 1.0 Introduction

We are delighted to present the Swimming Pool Management Handbook, Volume 1, which offers a concise and comprehensive overview of key guidelines, emphasizing the foundational principles of the 3K swimming pool management concept. This handbook serves as an essential resource, supporting effective swimming pool maintenance and upholding rigorous health and safety standards.

We extend our heartfelt gratitude to our President, Dr. Kelvin Liaw, for his exceptional efforts in compiling these guidelines, and to the members of PPFKRA for their unwavering dedication in bringing this publication to fruition. Additionally, we express our sincere appreciation to the members of Jabatan Kerajaan Tempatan (JKT) and Kementerian Perumahan dan Kerajaan Tempatan (KPKT), particularly Tuan Mohamed Yazid Hj Kuman, Cik Raihani binti Che Mamat, and Puan Siti Noridah binti Ayob, for their valuable contributions and insights during the review process. Looking ahead, Volume 2 will delve into treatment and preventive maintenance strategies, while Volume 3 will focus on the engineering aspects of swimming pool systems and their upkeep.

## 2.0 Objective

The Swimming Pool Management Handbook, Volume 1, is designed to provide a concise and comprehensive overview of guidelines and best practices for the effective management, operation, and maintenance of swimming pool facilities. Given the essential role of pools in modern life — whether in residential, commercial, or recreational settings — it is crucial for pool owners to have access to reliable reference materials that ensure safety, hygiene, and functionality.

This handbook offers clear, practical, and easy-to-follow instructions to assist pool owners in maintaining their facilities while adhering to regulatory standards and industry best practices. By consolidating key information into a single resource, the handbook aims to empower owners to manage their pools efficiently, prioritize safety, and preserve the longevity of their pool systems.

## 3.0 Definition

Swimming pools are broadly categorized into two types:

1. Public Swimming Pools – These facilities are owned and maintained by local authorities or entities appointed by the local authority (Pihak Berkuasa Tempatan).
2. Private Swimming Pools – These pools are owned and operated by individuals, clubs, institutions, associations, companies, or other organizations. Access to private pools may be granted to the public, either free of charge or through a fee-based system.

## 4.0 Application

As outlined in Section 4.0 - Scope of the Swimming Pool Water Quality Standard and Monitoring Guidelines for Public Pool Operators, and referenced within the relevant laws and regulations on page 4 of this handbook, these standards and guidelines are applicable to swimming pools operated for public use. This includes facilities situated at:

- Municipal and commercial sites
- Schools
- Hotels and motels
- Leisure centres, clubs, and resorts
- Camps
- Recreational water parks (e.g. wave pools, wading and receiving pools)
- Spas and gymnasiums
- Apartments, condominiums, and private pools

These standards and guidelines do not apply to:

- Natural water bodies
- Hydrotherapy and therapeutic exercise pools

## 5.0 Relevant Laws and Regulations

According to the Garis Panduan Pengurusan dan Penyenggaraan Kolam Renang Awam di Kawasan Pihak Berkuasa Tempatan, swimming pool owners are required to ensure that the development and management of swimming pool facilities adhere to the provisions of applicable acts, laws, regulations, and prevailing codes of practice that remain in force. The relevant laws and regulations include, but are not limited to:

- Akta Kerajaan Tempatan [Akta 171]
- Undang-Undang Kecil Bangunan Seragam 1984
- Akta Kilang dan Jentera 1967 (Pindaan 2006) [Akta A1268]
- Akta Keselamatan dan Kesihatan Pekerjaan 1994 [Akta 514]
- Malaysian Standard - MS IEC 60598-2-1998
- Malaysian Standard - MS IEC 603264-7-702-2003
- Garis Panduan Pemantauan Kualiti Air Kolam Renang by Kementerian Kesihatan Malaysia
- Swimming Pool Water Quality Standard and Monitoring Guidelines (for Public Pool Operators) by Kementerian Kesihatan Malaysia

Since 2020, new guidelines have been introduced to enhance safety and professionalism in water-related activities. These include the Garis Panduan Keselamatan dan Kesihatan Pekerjaan Aktiviti Rekreasi Air, issued by the Department of Occupational Safety and Health (JKKP) in 2020, and the Garis Panduan Papan Tanda Keselamatan di Kawasan Aktiviti Air, published in 2024 by the Majlis Keselamatan Aktiviti Air (MKAA). Swimming pool owners and operators should take these updates into account to ensure compliance with current standards and to promote a safe environment for all users.

## 6.0 3K Swimming Pool Management

The 3K Swimming Pool Management concept is a strategic initiative aligned with the goals of the Majlis Keselamatan Aktiviti Air (MKAA). It aims to elevate industry standards through three core pillars: Kesihatan (Health), Keselamatan (Safety), and Kejuruteraan (Engineering). These pillars play a crucial role in ensuring swimming pools not only comply with regulatory requirements but also offer a safe and hygienic environment for public use.

By implementing the 3K concept, pool operators can create and maintain facilities that prioritize user well-being. This includes rigorous maintenance of water quality, proactive measures to ensure swimmer safety, and preserving the structural integrity of pool systems. Such practices contribute to the longevity and sustainability of swimming pool facilities, ensuring they remain secure, operational, and enjoyable for years to come.

This initiative is well-aligned with MKAA's broader objectives to enhance swimming pool management practices, ultimately fostering greater safety, health, and satisfaction among pool users nationwide.

## 7.0 Safety (Keselamatan)

Between 2018 and 2022, Malaysia recorded a staggering 1,340 drowning-related deaths, as highlighted by YB Akmal Nasrullah Mohd Nasir, former Deputy Minister of the Ministry of Housing and Local Government (KPKT). This alarming statistic underscores the pressing need to strengthen safety measures in swimming pool facilities.

Swimming pool safety encompasses far more than the prevention of drowning; it involves a comprehensive approach to accident prevention, addressing issues like avoidable injuries. Effective pool management should include proper supervision, clear and visible safety signage, regular equipment maintenance and c visible safety signage, regular equipment maintenance and cge, regular equipment maintenance and comprehensive staff training.

Creating a secure maintained swimming pool environment is essential to enable users to enjoy the facilities while prioritizing their health and well-being. By emphasizing safety, we can cultivate a space where individuals, from children to adults, can experience the benefits of swimming with minimized risks.

### Note 1

Source: The Star by Imran Hilmy, dated 12 June 2023.

## 7.1 Signage

As outlined in the *Garis Panduan Pengurusan dan Penyenggaraan Kolam Renang di Kawasan Pihak Berkuasa Tempatan*, warning and reminder signs must be prominently placed in highly visible locations to mitigate health risks, injuries, and accidents. These signs should strictly comply with ISO standards, ensuring consistency and clarity.

Moreover, depth markers are required to be positioned along the pool's edge in easily visible locations, particularly at depth transition points. The markers should be a minimum of 150mm in height, feature text in a contrasting color to the pool wall, and include the term "meter" or its abbreviation "m." Additional methods to indicate depth levels are also encouraged to enhance the safety of pool users.

## 7.2 Bathing Load

According to the *Swimming Pool Water Quality Standard and Monitoring Guidelines*, pool operators are advised to ensure that the number of pool users does not exceed the allowable maximum limit at any given time. This limit should be calculated based on the pool's depth and aligned with the British Standard Institute (BSI) Code of Practice for Swimming Pools, 2003.

Table 1: Maximum Allowable Bathing Load for Swimming Pools.

Water Depth	m <sup>2</sup> Per Person
< 1m	2.2
1m - 1.5m	2.7
> 1.5m	4

BSI Code of Practise in Swimming Pool, 2003.

## 7.3 Emergency and Rescue Equipment

According to the *Garis Panduan Keselamatan dan Kesihatan Pekerjaan Aktiviti Rekreasi Air* and the *Garis Panduan Pengurusan dan Penyenggaraan Kolam Renang di Kawasan Pihak Berkuasa Tempatan*, swimming pool facilities are encouraged to have the following lifesaving equipment readily available:

Ring buoy / Life buoy (personal floatation device)  
Rescue rope

Additionally, emergency equipment including:

First aid kit  
AED (Automatic External Defibrillator) - Recommended

should be made available for emergency purposes.

## 7.4 Lifeguards

For swimming pools staffed with lifeguards, it is advisable to ensure a sufficient number of lifeguards are stationed during both off-peak and peak hours to maximize safety and supervision. This recommendation aligns with the Garis Panduan Pengurusan dan Penyelenggaraan Kolam Renang Awam di Kawasan Pihak Berkuasa Tempatan.

Table 2: Lifeguard Requirements Schedule based on Pool Area

Estimated Pool Size (meter)	Area (m <sup>2</sup> )	Min No of Lifeguard (Off-Peak)	Min No of Lifeguard (Peak)
20.0 x 8.5	170	1	2
25.0 x 8.5	212	1	2
25.0 x 10.0	250	1	2
25.0 x 12.5	312	2	2
33.3 x 12.5	416	2	3
50.0 x 20.0	1000	4	6

Garis Panduan Pengurusan dan Penyelenggaraan Kolam Renang Di Kawasan Pihak Berkuasa Tempatan

## 7.5 Risks

As detailed in Section 5.7 - Pengurusan Risiko of the Garis Panduan Pengurusan dan Penyelenggaraan Kolam Renang Awam di Kawasan Pihak Berkuasa Tempatan, the Occupational Safety and Health Act 1994 [Act 514] requires swimming pool owners to uphold the safety, health, and well-being of both users and employees at their facilities. This mandate encompasses implementing all necessary measures to mitigate risks to safety and health during both work-related activities and recreational use of the pool.

Additionally, Section 104 - Penalties for Breaches of By-Laws under the Akta Kerajaan Tempatan [Akta 171] empowers local authorities to impose penalties for violations of by-laws, rules, or regulations through established provisions.

These guidelines emphasize the critical importance of compliance and proactive risk management in creating safer swimming environments for all.

## 8.0 Health (Kesihatan)

The occurrence of disease outbreaks in swimming pools in Malaysia, such as the rotavirus outbreak in 2016 and the E.coli outbreak in 2024, which resulted in hospitalizations, underscores the serious risks posed by poor pool water quality. These incidents highlight the critical need for maintaining swimming pool water that is clean and free from contamination to safeguard users' health and safety.

Ensuring healthy pool water requires diligent monitoring of physical and chemical parameters to verify that it meets health standards and remains safe for swimming. Effective water treatment and sanitation protocols play a vital role in reducing infection risks while contributing to the pool's overall quality and longevity. By adhering to established water quality guidelines, swimming pool operators can foster a safe and hygienic environment for swimmers, allowing them to enjoy the health benefits of swimming without unnecessary risks. This proactive approach is fundamental to protecting public health and ensuring the sustainable upkeep of swimming pool facilities.

## 8.1 Parameters

The parameters that should be monitored regularly include:

### Physical

- pH
- Turbidity
- Temperature

### Chemical

- Free Residual Chlorine
- Combined Residual Chlorine (Chloramines)
- Total Alkalinity
- Hardness
- Total Dissolved Solids
- Cyanuric Acid
- Nitrate

### Microbiology

- Escherichia coli (E. coli)

## 8.2 Water Quality Standard

The acceptable standard values for monitored parameters are outlined below. These standards specifically apply to treated pool water, with a strong emphasis on parameters directly related to disinfection.

Table 3: Water Quality Standard for Swimming Pools

No.	Parameters	Unit	Standard Values
1	Free Residual Chlorine	mg/L	0.5 - 3.0
2	pH	-	7.0 - 7.8
3	Turbidity	NTU	≤ 5.0
4	Temperature	C°	21.2 - 32.2
5	Total Alkalinity	mg/L	80 - 200
6	Hardness (Calcium)	mg/L	75 - 250
7	Total Dissolved Solid	mg/L	≤ 1000
8	Cyanuric Acid	mg/L	≤ 50
9	Nitrate	mg/L	≤ 10
10	Escherichia coli (E. coli)		Absent in 100 ml

Swimming Pool Water Quality Standard and Monitoring Guidelines

## 8.3 Testing

Regular testing and monitoring of pool water parameters are essential to ensure compliance with established water quality standards.

Daily

- pH and Free Residual Chlorine

Monthly

- E. coli, Turbidity, Nitrate and Cyanuric Acid

Quarterly

- Total Alkalinity, Hardness (Calcium) and Total Dissolved Solid

## 8.4 Record

As stated in Section 14.5 of the Swimming Pool Water Quality Standard and Monitoring Guidelines, all records of swimming pool water test results — whether conducted daily, monthly, or quarterly — must be retained for a minimum of 12 months. These records must be readily available for inspection by Health Authorities or Local Authorities (Pihak Berkuasa Tempatan) at any time.

This requirement reinforces transparency and accountability in swimming pool water management. By diligently maintaining accurate records, pool operators demonstrate their commitment to providing safe and hygienic swimming conditions, ensuring regulatory compliance. Moreover, it enables authorities to monitor water quality effectively and address potential issues promptly, safeguarding public health and creating a secure recreational environment.

## 9.0 Engineering (Kejuruteraan)

Ensuring swimming pool water safety goes beyond chemical treatments; it also encompasses proper engineering and regular maintenance of the entire pool system. Achieving both safe water quality and long-term functionality requires a holistic approach that integrates these essential practices. This comprehensive strategy is embedded within the Environmental, Sustainability, and Governance (E.S.G.) framework of the 3K Swimming Pool Management concept focusing on three key pillars:

- Environmental for Health: Ensuring pool water remains clean and safe for swimmers, protecting public health.
- Sustainability for Longevity: Conducting regular maintenance to prolong the pool's lifespan while keeping it safe and operational.
- Governance for Compliance: Adhering to established guidelines and regulations to uphold safety standards and maintain accountability.

By combining both chemical treatments and engineering practices, swimming pool operators can foster a safe, sustainable, and compliant environment, ensuring the well-being of users and the overall integrity of the facility.

## 9.1 Maintenance

According to Paragraph 6.1 of the Garis Panduan Pengurusan dan Penyenggaraan Kolam Renang di Kawasan Pihak Berkuasa Tempatan, it is recommended that pool owners establish a comprehensive cleaning and maintenance schedule. This schedule should cover all aspects of swimming pool facilities to ensure regular upkeep, maintaining both cleanliness and functionality. Adhering to this guideline helps pools meet the required safety and health standards, creating a secure and hygienic environment for users.

## 9.2 Scope of Works

The recommended maintenance scope of work includes, but is not limited to, the following:

- Overall Maintenance
- Balancing Tank
- Ladders, Handrails, Play Equipment, Signboard and Other Accessories
- Underwater Lights
- Pump Room
- Filters
- Motors and Pumps
- Control Panels

### 10.0 Responsibilities

According to Section 16.0 - Duties and Responsibilities of Pool Operators in the Swimming Pool Water Quality and Monitoring Guidelines, pool operators are tasked with the following critical responsibilities:

1. **Water Quality Standards:** Operators must ensure their pools consistently meet specified water quality standards and take immediate corrective actions to address any deviations.
2. **Maintenance of Testing Equipment:** All test equipment must be properly maintained and cleaned, with test reagents subjected to regular quality control checks.
3. **Storage and Handling of Bulk Chemicals:** For safe storage and handling of bulk chemicals, operators must comply with the Peraturan-Peraturan Keselamatan dan Kesihatan Pekerjaan (Penggunaan Dan Standard Pendedahan Bahan Kimia Berbahaya Kepada Kesihatan) 2000; and
4. **Material/Chemical Safety Data Sheets (MSDS):** Operators are required to maintain and keep readily accessible material or chemical safety data sheets for all chemicals used in pool treatment. These sheets must be available to pool workers handling the chemicals.

### 11.0 References

- Garis Panduan Pengurusan dan Penyenggaraan Kolam Renang Awam di Kawasan Pihak Berkuasa Tempatan (Jabatan Kerajaan Tempatan, Kementerian Perumahan dan Kerajaan Tempatan)
- Swimming Pool Water Quality Standard and Monitoring Guidelines for Public Pool Operators (Kementerian Kesihatan Malaysia)
- Garis Panduan Keselamatan dan Kesihatan Pekerjaan Aktiviti Rekreasi Air (Jabatan Keselamatan dan Kesihatan Pekerjaan, Kementerian Sumber Manusia)
- Garis Panduan Papan Tanda Keselamatan di Kawasan Aktiviti Air (Majlis Keselamatan Aktiviti Air, Kementerian Perumahan dan Kerajaan Tempatan)

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