



S u s t a i n w a t e r

FILTRATION

www.tikal-co.com



Mission

Preserve water resources from waste, non-use and pollution by providing innovative and affordable water treatment and irrigation systems that are more up-to-date with technology.



Vision:

Empowering our region to become a global role model in water resource protection by strategically addressing physical, chemical, and biological gaps.



Company overview

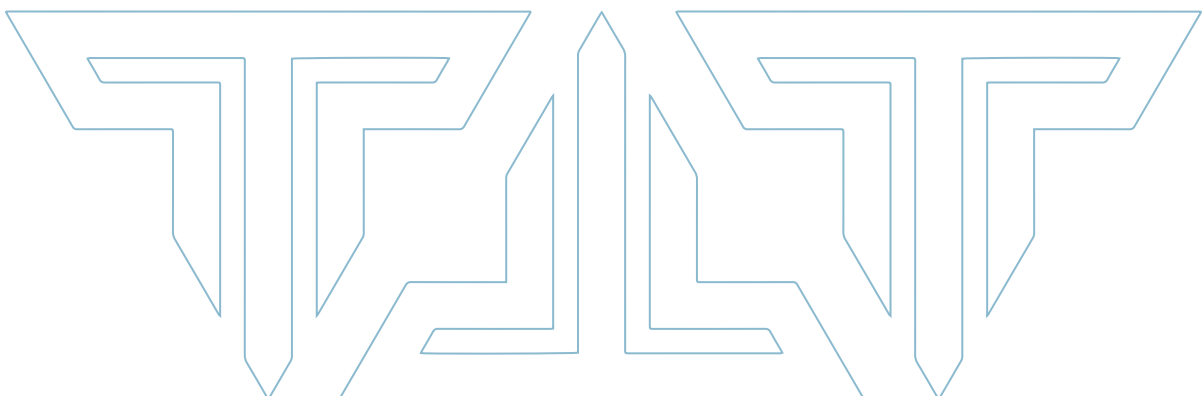
At Tikal Water & Irrigation Systems, we hold the belief that everyone deserves a sustainable environment free from pollution and resource wastage.

Tikal was Founded in 2019 by a group of engineers driven by initiative, innovation, and renewal, it was established to address the pressing challenges of untreated water, and unsustainable irrigation practices.

Our concern is to provide a range of integrated solutions and services that play a crucial role in physical, chemical, and biological challenges, and apply them through Vital national projects.

Tikal also attaches special importance to small communities by designing customized and intelligent solutions that allow using modern technologies and meet all needs and standards.

At Tikal, we aim to preserve and sustain water resources and are committed to delivering the latest solutions and services to our clients. To achieve this, we invest in research and development to enhance access to modern technologies and making a positive impact on the world.





Tikal Water Solutions

A. Utilities

«Through its water solutions, Tikal Company aims to simplify the process of preserving and benefiting from water resources by providing comprehensive and integrated solutions for most vital processes in water treatment, Through (Headworks) Tikal aims to provide Primary treatment one of the urgent roles in wastewater treatment, (Clarification) Our solution to remove of SS, Colloidal Particles, and impurities from raw water, Followed by)Filtration) to achieve the desired level of purity, and for Treatment and dispose of Sludge (Sludge treatment).

Tikal else provides physical solutions through (Pump Station) To prevent some harmful phenomena." these solutions have more than 71% coverage of basic water treatment processes and we aim to be up-to-date continuously.»



B. Small Communities:

TikalOne™, a pioneer division within our corporate framework, is strategically poised to revolutionize water treatment for small communities, ranging from 500 to 50,000 residents.

Born out of a commitment to excellence and guided by the principles of precision and innovation, TikalOne™ offers a visionary approach to integrated water solutions.

At its core, TikalOne™ is not just a brand; it's a scientific breakthrough in water treatment. Embracing the concept of modular intelligence, our bespoke systems, include Sea Water Reverse Osmosis (SWRO), Brackish Water Reverse Osmosis (BWRO), Munacibile water treatment (MW), MBBR (Moving Bed Biofilm Reactor), and SBR (Sequential Batch Reactor).

These units are designed to the distinctive characteristics of each water source. with cutting-edge, adaptable approach allows TikalOne™ to transcend traditional water treatment models. With a palette of technological sophistication and an unwavering commitment to sustainability,

TikalOne™ aspires to be the hallmark of professional water management, setting new standards for efficiency, reliability, and environmental consciousness.



TikalOne™

Filtration Solutions by Tikal

Enhancing Water Quality
Across Applications

Table of Content

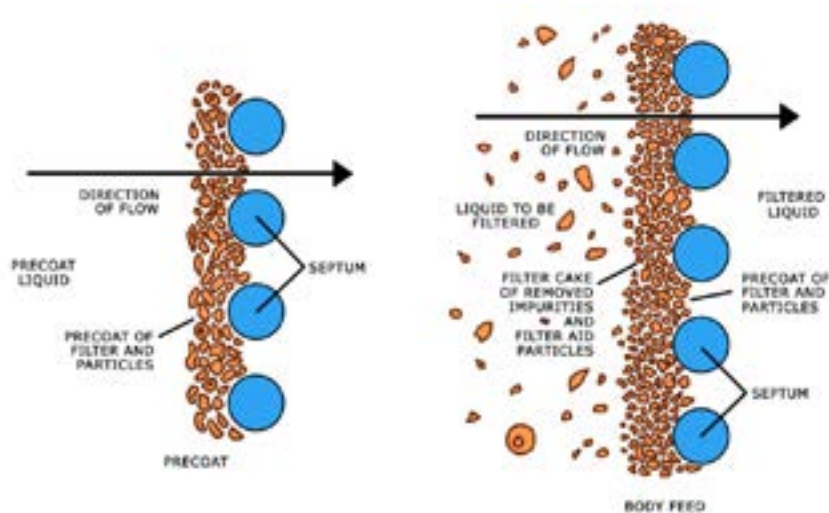
Company overview	2
Tikal Water Solutions	3:4
Filtration	6:9
Tikal Filtration solution:	xx
1. Gravity Filters	10
1.1 Rapid Sand Filter	11:18
1.2 Slow Sand Filter	19
2. Gravel Filters	23
3. Pre-filtration	27
4. Tertiary Filtration	34
5. Ion Exchange system:	39
5.1 Softener	40
5.2 De-ionization	42



Filtration Methods and Technologies

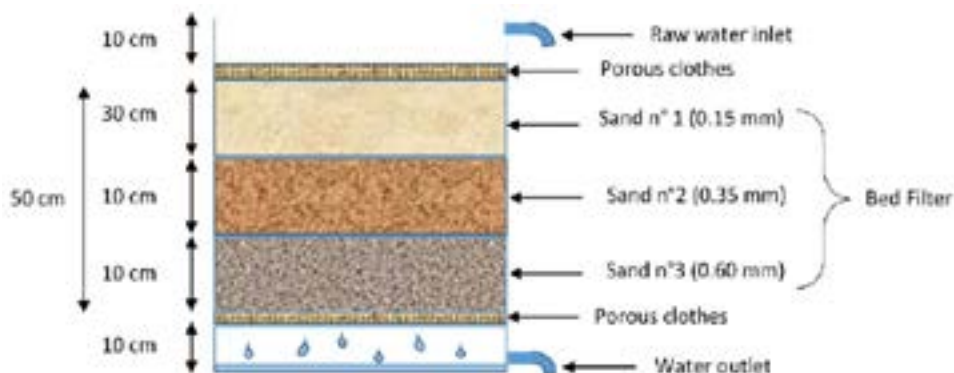
What is Filtration:

Filtration stands as a fundamental process in water treatment, dedicated to removing suspended particles, sediments, and impurities from raw water. It recognizes the significance of this process in achieving the desired water purity level, ensuring clean and safe water for diverse applications. Filtration involves guiding water through a physical barrier or filter medium, which can range from sand and gravel to activated carbon and synthetic membranes.



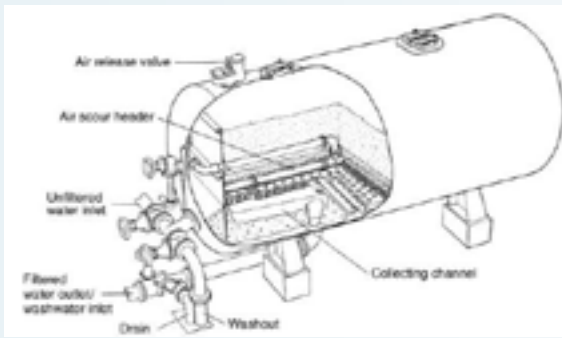
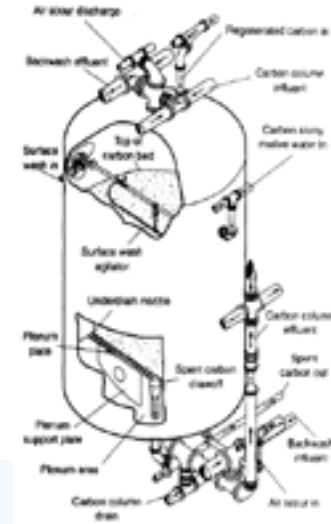
• Sand Filtration

A common method where water passes through a bed of sand, trapping particles in the porous spaces between grains.



- **Activated Carbon Filtration**

Effective in adsorbing organic compounds, chlorine, and substances affecting taste and odor.

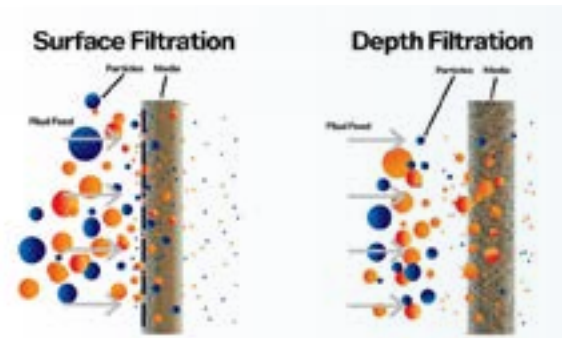
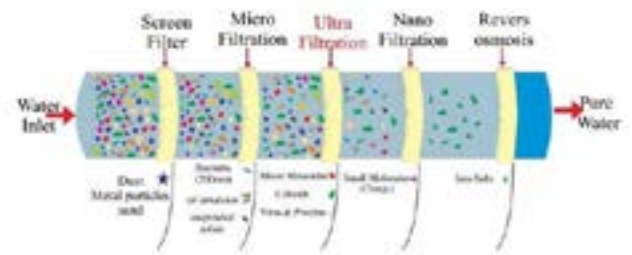


- **Multimedia Filtration**

Utilizes layers of different media like sand, anthracite, and garnet to enhance filtration efficiency.

- **Membrane Filtration**

Includes microfiltration, ultrafiltration, nanofiltration, and reverse osmosis, using semipermeable membranes.



- **Cartridge Filtration**

Water passes through replaceable cartridges with various filter materials.

Integration into Water Treatment Train

Filtration is often integrated into a comprehensive water treatment train, following processes like coagulation, flocculation, and sedimentation. These pretreatment steps aggregate and settle larger particles, facilitating their removal during filtration. The combination guarantees water meeting stringent quality standards.





Tikal Filtration Systems Applications

Tikal offers a diverse range of filtration solutions tailored to various applications, catering to the unique needs of different water treatment scenarios.

Applications

Tikal's Filtration Solutions are applicable in the following key areas

Potable/Municipal Water Plant

Tikal provides comprehensive filtration systems designed for traditional potable water treatment plants. These systems are effective in removing impurities, ensuring the production of clean and safe drinking water for municipal use.



Sewage Treatment Plants

Tikal's Filtration Solutions are applied in sewage treatment plants to address the challenges associated with wastewater treatment. These systems play a crucial role in the removal of impurities from sewage, contributing to the overall efficiency of the treatment process.

Industrial Wastewater Treatment Plants

Industrial processes often generate wastewater with specific contaminants. Tikal's filtration systems are designed to meet the unique requirements of industrial wastewater treatment, ensuring the removal of impurities before discharge or reuse.



Reverse Osmosis (RO)

Tikal offers filtration solutions compatible with reverse osmosis systems. These systems play a vital role in preparing water for the RO process, removing suspended particles and impurities that could potentially impact the efficiency and lifespan of RO membranes.

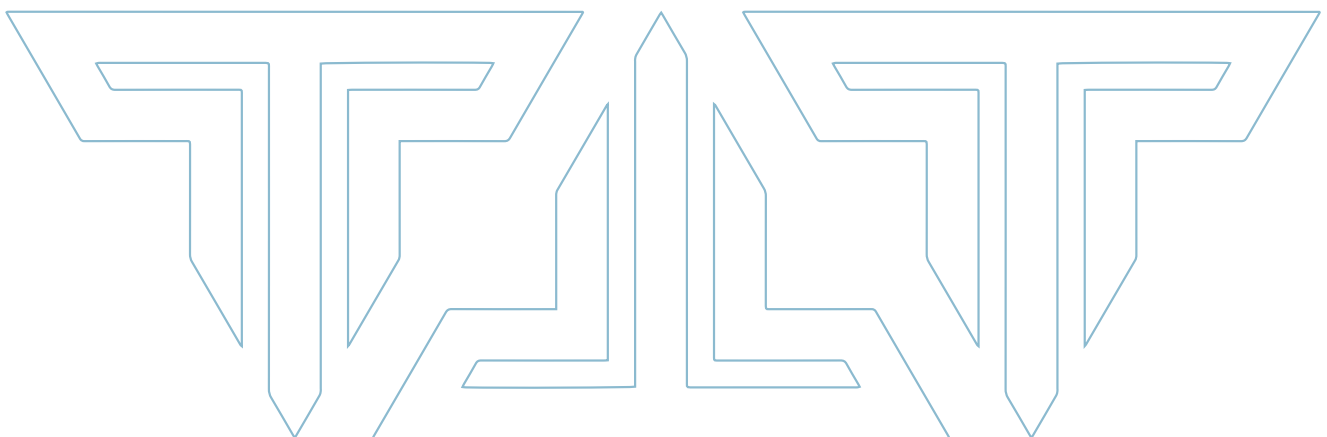


Ultrafiltration

Tikal's filtration solutions are integrated into ultrafiltration processes, contributing to the effective removal of particles and impurities from water. Ultrafiltration is a critical step in producing high-quality water in various applications.

Ion Exchange Applications

Filtration systems by Tikal are suitable for ion exchange applications, ensuring that water entering ion exchange processes is free from suspended particles and impurities that could affect the ion exchange resins.





Tikal Systems

1. Gravity Filters

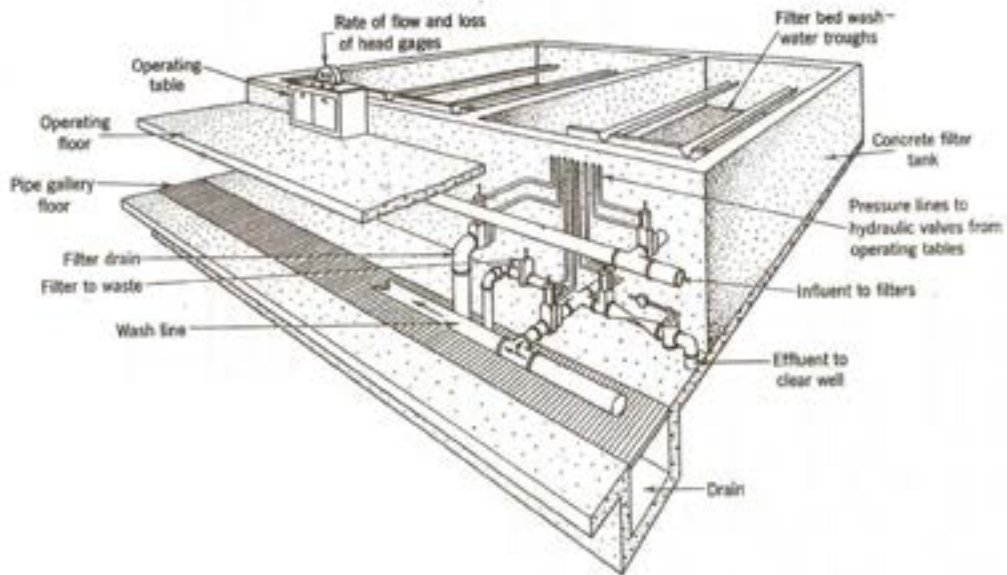
In traditional potable water treatment plants, Tikal gravity filters Design are a common and effective method of removing impurities from water. These filters operate on the principle of gravity, allowing water to flow through a filter bed under the influence of gravitational force. Tikal also supply filter bed typically consists of layers of different media, such as sand, gravel, and anthracite, coal (Optional), arranged in a specific order.

The force of gravity pulls water downward through this filter bed, and the media in the bed physically trap and remove suspended particles and impurities from the water, And Tikal Gravity Filters divided through Two common system.

1.1 Rapid sand filter (Nozzle system)

• Design Principle:

Gravity-driven water flow through a bed of sand, gravel, and optional anthracite coal.



• Tikal design Features

1. Nozzle Distribution System

The key feature of Tikal's rapid sand filters with nozzle systems is the use of a carefully designed distribution system consisting of nozzles or distributors. These nozzles are strategically placed to ensure uniform water distribution across the entire surface of the filter bed.



2. Underdrain nozzles

Tikal create special design underdrain nozzle to allow backwashing with air and water. The nozzle slots are sized to prevent the escape of the media; the nozzle head is attached to a tube slotted at its lower section through which air is introduced. Depending on the media that is used, nozzles can be provided with slot openings ranging between 0.2 and 2.0 mm.

3. High Flow Rates

Tikal create special design underdrain nozzle to allow backwashing with air and water. The nozzle slots are sized to prevent the escape of the media; the nozzle head is attached to a tube slotted at its lower section through which air is introduced. Depending on the media that is used, nozzles can be provided with slot openings ranging between 0.2 and 2.0 mm.

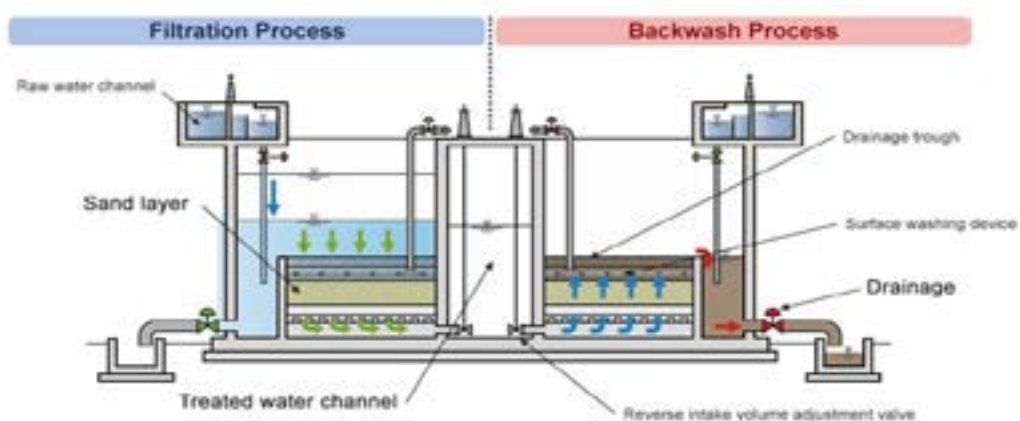


4. Fine and Coarse Media Layers

Similar to traditional rapid sand filters, these filters typically consist of layers of fine and coarse media (such as sand and gravel). The arrangement of these layers allows for effective physical filtration as water passes through the filter bed.

5. Backwashing System

To maintain the performance of the filter, a backwashing system is incorporated. Backwashing involves reversing the flow of water through the filter bed to dislodge and remove accumulated particles. The distribution system ensures an even backwash, contributing to the effective cleaning of the filter media.



Rapid sand filter (Nozzle system) Advantages

Uniform Water Distribution

The nozzle distribution system ensures uniform water distribution across the entire filter bed. This uniformity is crucial for optimizing the filtration process and preventing channeling, where water follows preferred pathways through the media, bypassing some areas.

Increased Filtration Efficiency

The even distribution of water enhances the filtration efficiency of the rapid sand filter. It promotes thorough contact between water and the filter media, maximizing the removal of suspended particles and impurities.

Reduced Channeling

Channeling is minimized or eliminated due to the uniform distribution of water, preventing the formation of preferential flow paths that can compromise the filtration effectiveness.

Suitable for High Flow Rates

Rapid sand filters with nozzle systems are well-suited for applications with high flow rates, making them ideal for water treatment plants serving large populations or industries with substantial water demand.

Enhanced Backwashing

The nozzle system facilitates effective backwashing by ensuring that the backwash water is evenly distributed. This contributes to the removal of accumulated impurities and helps maintain the longevity and performance of the filter.

Conclusion

Tikal's Rapid Sand Filters with Nozzle Systems offer superior water distribution and filtration efficiency, making them effective in large-scale water treatment applications. The design enhancements contribute to consistent and high-performance filtration, meeting the demands of water treatment plants serving diverse populations or industries.



1.1 Rapid Sand Filter (M-Block System)

The M-block filter bottom is a structural component used in water filtration systems, specifically in the underdrain mechanism. Here are the key features and functions of the M-block filter bottom

• Block Features

1. Construction

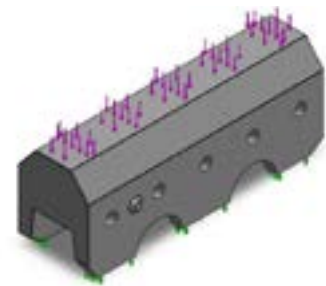
The M-block filter bottom is constructed using plain compact hollow concrete blocks with an approximately M-shaped design.

2. Material

It is prefabricated from high-grade concrete, ensuring durability and strength.

3. Surface

The surface of the M-block is smooth, contributing to efficient water flow.

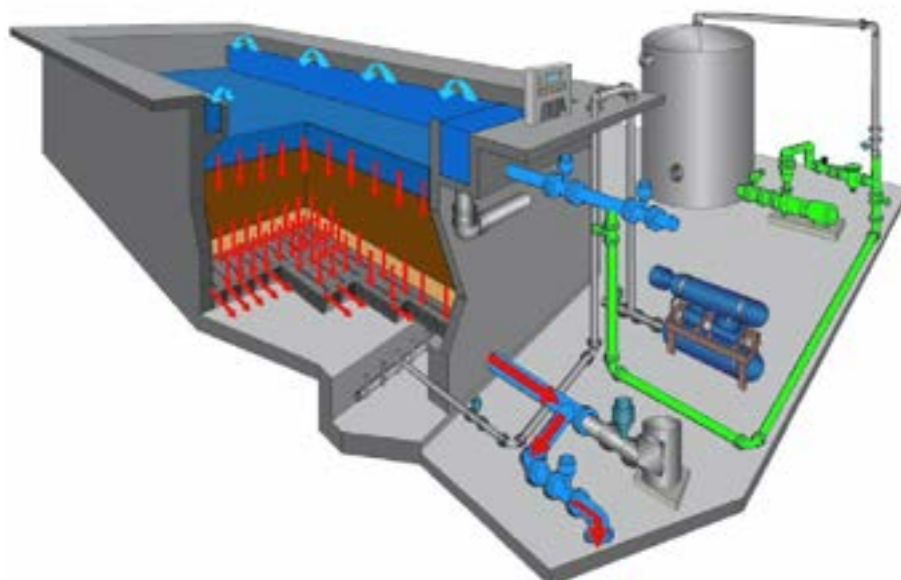


4. Installation

The blocks are laid in rows on the level filter compartment floor. Importantly, they are neither anchored nor sealed, allowing for straightforward installation.

5. Structural Conditions

The design results in convenient structural conditions, providing stability and support for the filter bed.



• Underdrain Mechanism (Filtration)

1. Calibrated Bores:

Inside every second row of M-blocks, there is a corrosion-proof pipe containing calibrated bores. This pipe is designed to distribute the inlet flow of scour air evenly over the area of the filter bed.

2. Honeycombed Interior:

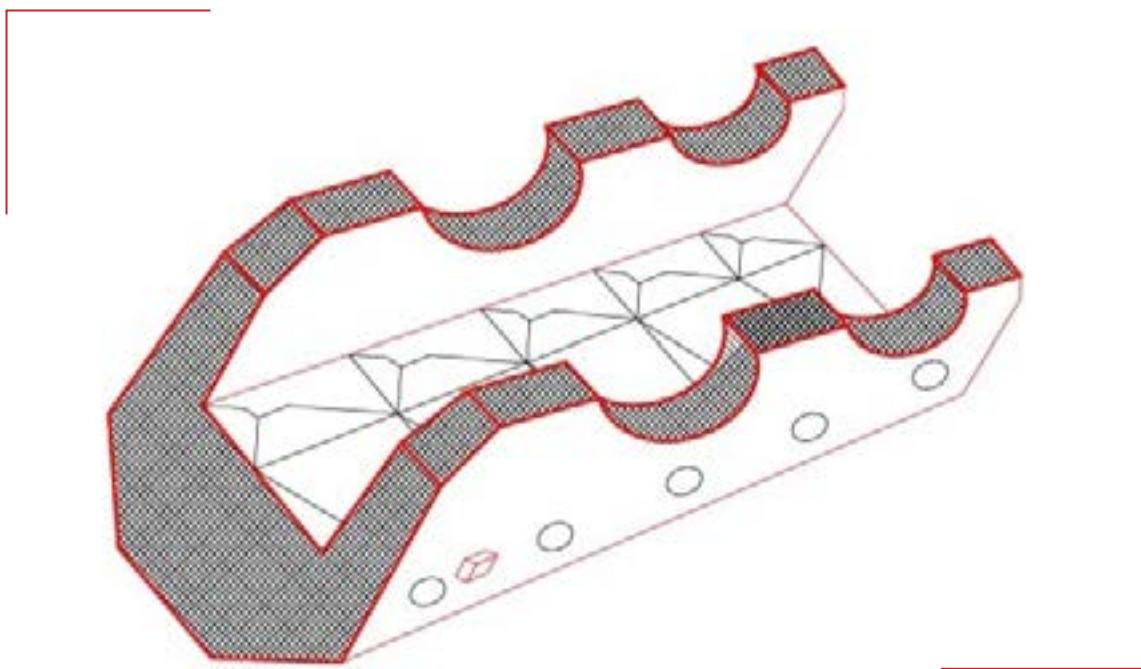
The interior of the M-block heads is honeycombed, creating a structure that opens into outlet ports at the highest points. This allows air to pass entirely without restriction.

3. Uniform Scour Air Distribution:

The honeycombed structure ensures that the scour air entering the distribution system is discharged from the filter bottom in a uniform pattern. The air flow path is positively controlled by the filter bottom.

4. Arched Openings:

Large arched openings on the underside of the M-blocks prevent loss of head in the inlet flow of wash water and outlet flow of filtered water.



• Backwash Mechanism

1. Cleaning Process

After a certain time in operation, filters accumulate impurities that must be cleaned through backwashing.

2. Air-and-Water Wash

Backwashing is performed by air-and-water wash. Flows of air and water are introduced through the underdrain system at the bottom of the filter.

3. Even Distribution

The flows are distributed evenly across the entire filter area, and they move concurrently upwards through the filter bed.

4. Impurity Dislodging

As the air and water pass through the filter bed, they dislodge the accumulated impurities, carrying them out of the filter.

5. Wash Water Drainage

The wash water, containing the removed impurities, drains off into a sludge gutter.

6. Air Release

The air used in the backwashing process is released into the atmosphere.



• Underdrain System's Purpose

1. Support

In normal operation, the underdrain system supports the filter bed and the water head imposed on it.

2. Filtrate Outflow:

It permits outflow of filtrate without entraining particles of the filter medium.

Conclusion

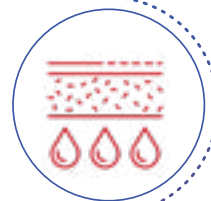
Overall, the M-block filter bottom, with its well-designed underdrain mechanism, contributes to efficient and controlled water filtration processes.

Rapid Sand Filter (M-Block System)

Service | Product Offering

1. Technology Identification

Tikal provides expertise in identifying appropriate water treatment technologies.



2. Process Design

Offering services in the design of water treatment processes tailored to specific needs.



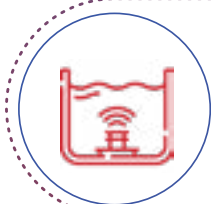
3. Engineering

Providing engineering solutions for the implementation of water treatment systems.



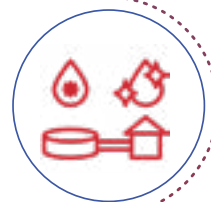
4. Project Execution

Managing the execution of water treatment projects from initiation to completion.



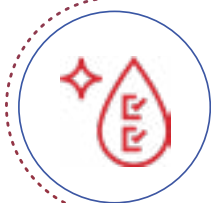
5. Start-Up

Ensuring a smooth start-up process for newly implemented water treatment systems.



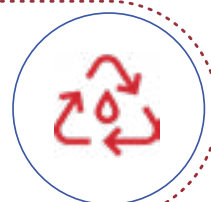
6. Commissioning & Performance Testing

Conducting commissioning and performance tests to guarantee system functionality.



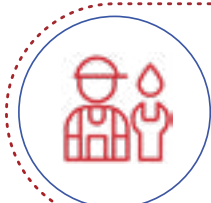
7. Rehabilitation

Offering services for the rehabilitation of existing water treatment systems.



8. Maintenance & Installation

Providing ongoing maintenance and installation support for water treatment facilities.



Product

1. Filter Nozzles

Offering a variety of filter nozzles to meet diverse water treatment needs.

2. Nozzle Slabs

Providing slabs equipped with nozzles for effective water distribution.

3. M-Block

Offering various types of M-Block components for water filtration systems.

4. Sand

Supplying sand in all sizes for use in water filtration processes.

5. Gravel

Providing gravel in all sizes to facilitate effective water filtration.

6. Underdrain Piping System

Supplying underdrain piping systems for efficient water distribution.

7. Air Blower System

Offering air blower systems to support specific water treatment processes.



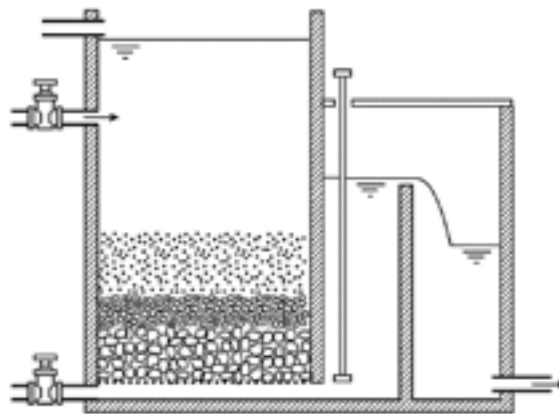
Tikal's comprehensive service and product offerings cater to the design, implementation, and maintenance of water treatment systems across various applications, ensuring the delivery of clean and safe water.

1.2 Slow Sand Filter

• Tikal's Design Features

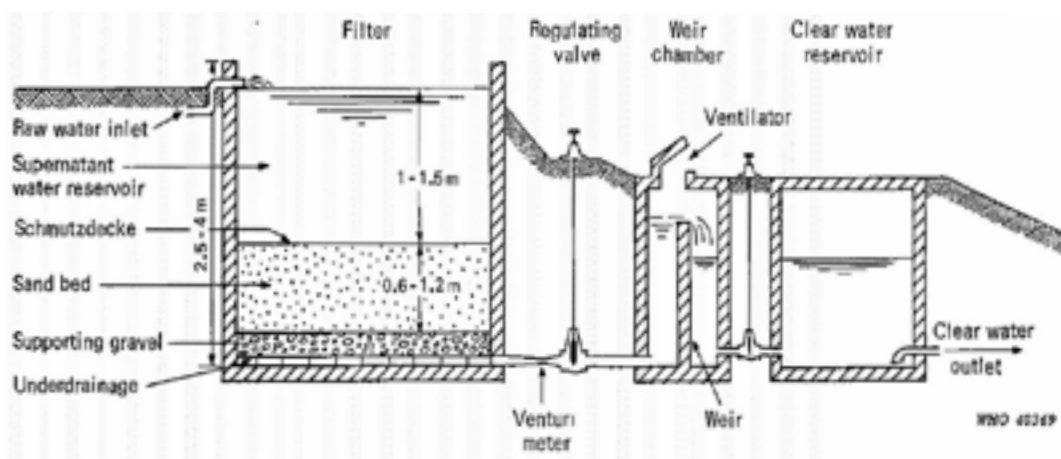
1. Flow Rate

- Slow sand filters operate at significantly lower flow rates, typically in the range of 0.1 to 0.3 gallons per minute per square foot (gpm/sq ft).
- The slow rate of filtration is a key characteristic that enhances the effectiveness of biological and physical processes in water treatment.



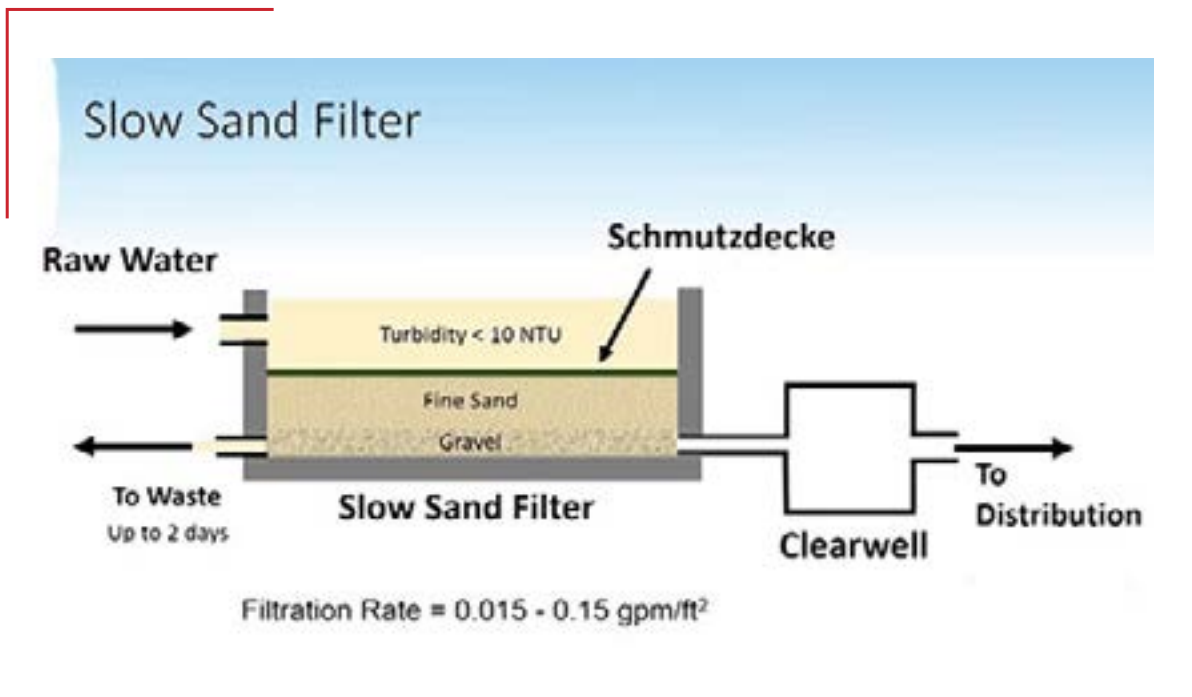
2. Mechanism of Filtration

- Slow sand filters employ a combination of physical and biological processes.
- The top layer of the filter bed develops a biological layer called the schmutzdecke, consisting of microorganisms that contribute to the breakdown and removal of organic matter.
- The slow flow rate facilitates effective biological filtration, and the schmutzdecke is periodically scraped off and regenerated to maintain efficiency.



3. Maintenance

- Slow sand filters typically require less frequent maintenance.
- The regeneration of the biological layer is a natural process, and maintenance tasks focus on occasional scraping and cleaning of the top layer to ensure continued efficiency.



4. Applicability

- Slow sand filters are well-suited for smaller-scale applications, decentralized water treatment systems, and situations where a more natural and biological approach to water treatment is desired.

Slow Sand Filter Advantages

Simple System, Low Cost

The slow sand filter system is simple, and its cost is low if land is available; however, costs may increase if land is limited.

Does Not Require Skilled Labor

The system does not require highly skilled labor for operation.

High Quality of Produced Water

The filter can achieve a very high percentage of bacteria and virus removal (99-100%).

Slow Operation

The slow operation may take weeks or months, depending on the concentration of suspended or colloidal materials.

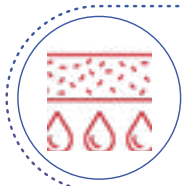
Operation Without Energy, Electrical Control Systems, Backwash, Chemicals, or Membranes

Slow sand filters operate without the need for external energy sources, electrical control systems, backwash procedures, chemicals, or membranes.

slow sand filter offers a cost-effective, natural, and biological approach to water treatment, making it suitable for various applications, especially in smaller-scale and decentralized systems.

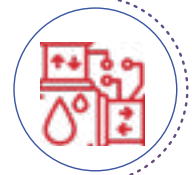
Slow Sand Filter

Service | Product Offering



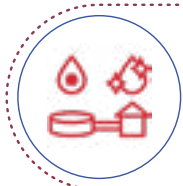
1. Technology Identification

2. Process Design



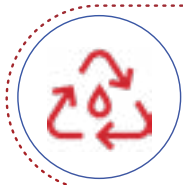
3. Engineering

4. Project Execution



5. Start-Up

6. Commissioning & Performance Testing



7. Rehabilitation,
Maintenance & Installation

Product

- Sand by all sizes, Gravel By all Sizes, Underdrain Piping system.

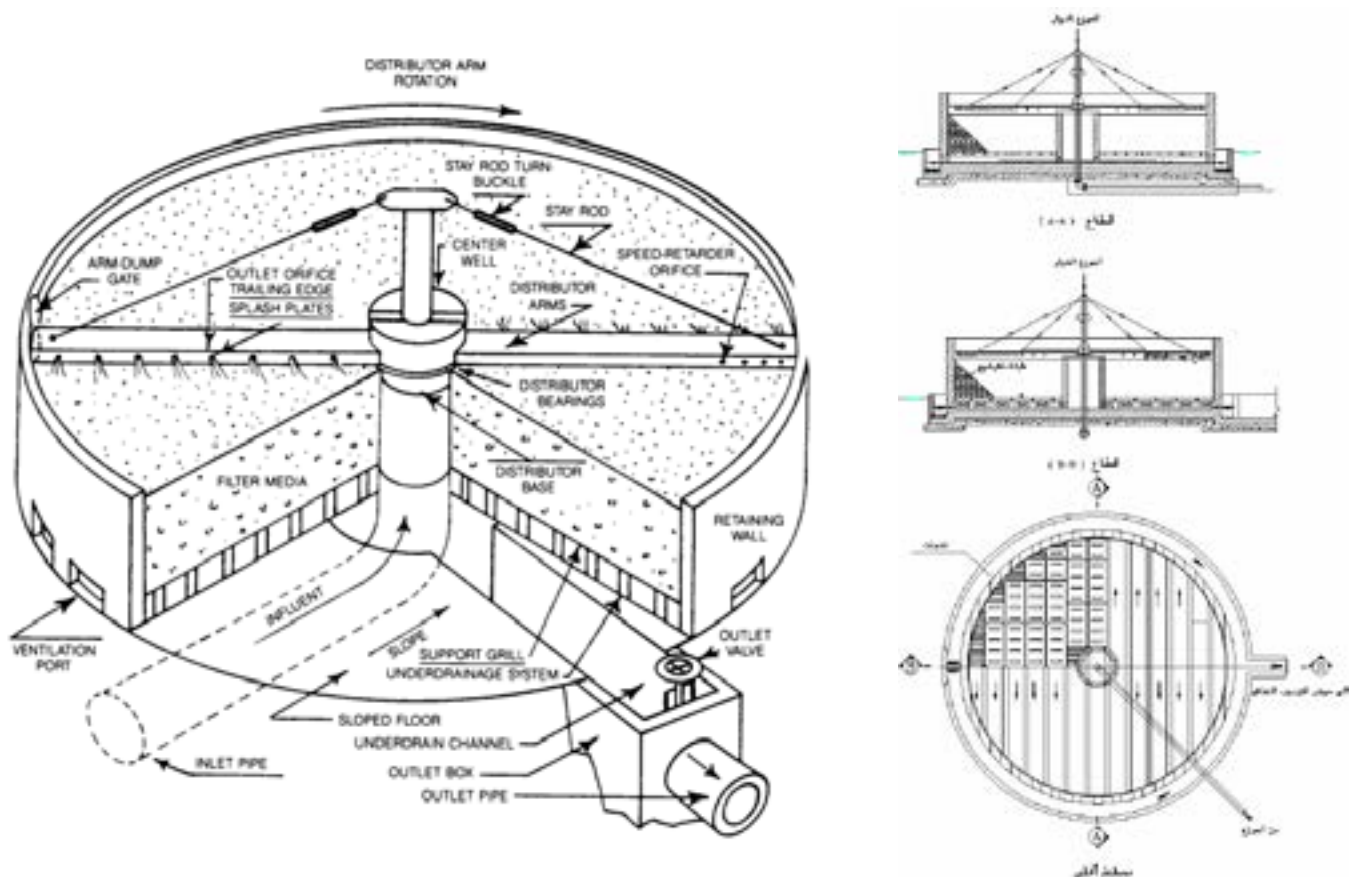
Applications

- Potable water treatment plant(PWTP).
- Sewage treatment plant (STP).

2. Gravel Filter (Biological Treatment)

• Treatment Mechanism

1. The biological or gravel filter is a basin containing a fixed, non-gradient scale of gravel. The water passes through the pores where bacteria adhere to the gravel (filtration media).
2. Biofilms, the layers of bacteria adhered to the outer parts of the gravel, absorb and decompose the organic substances present in the wastewater.
3. As aerobic bacteria grow and multiply, the thickness of the biofilm increases, leading to oxygen consumption before reaching the inside of the membrane. This creates an anaerobic environment close to the surface of the gravel.
4. The increasing thickness of the biofilm results in the consumption of organic materials before reaching the bacteria near the surface of the gravel.
5. As a result, these bacteria reach the stage of death, lose their ability to adhere, fall with the liquid, and then begin to form another layer of biofilm, continuing the cycle.



• Gravel Tank Features

- **Filtration Medium:** Gravel
- **Surface Loading Rate (m³/m²/day):** 410-
- **Organic Loading Rate (kg BOD/m³/day):** 0.240.48-
- **Return Rate (%):** 0 : 100
- **Depth of Filtration Material (m):** 1.82.4-
- **Removal Rate of Organic Matter (BOD):** 5080-

Gravel Filter (Biological Treatment) Advantages

Easy and Simple Operation

The system is easy to operate and maintain.

Lower Electrical Power Requirement

The total electrical power required for operation is less than that of activated sludge systems.

Flexible Design

It can be designed to receive high organic rates with the selection of appropriate media.

No Skilled Labor Required

It does not require highly skilled labor for operation.

Suitable for Small Capacities

Ideal for plants with small capacities (5,000 - 20,000 m³/day).

Lower Sludge Production

Produces smaller amounts of sludge compared to sludge systems.

No Aeration Equipment Needed

It does not require water aeration equipment such as activated sludge systems (surface aerators - compressed air crystals).

Nitrification without Increased Aeration Rates

Nitrification of ammonia can be obtained without an increase in aeration rates, similar to activated sludge systems.

Defects

1. Not Suitable for Large Capacities

Not suitable for plants with large capacities or systems.

2. Limited Flexibility

Limited flexibility in converting the treatment system to alternative equivalents such as activated sludge systems.

3. Odor and Fly Issues

May result in the spread of odors around the station and the spread of flies. High-quality primary treatment is required to prevent early blockage.

4. Return Pump Necessity

The need to create return pumps to mix treated water with raw material before entering the asphalt filter to reduce loads.

5. Possibility of Clogging

The possibility of clogging parts of the filter, requiring the stoppage of the filter, cleaning the medium, and re-brushing it.

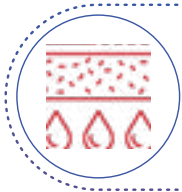
6. Standards Compliance Issues

Sometimes, a finished product that meets standards may not be obtained, requiring supplementation of biological treatment with an activated sludge system.



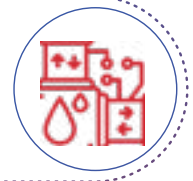
Gravel Filter (Biological Treatment)

Service | Product Offering



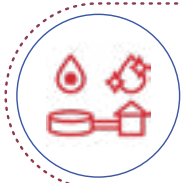
1. Technology Identification

2. Process Design



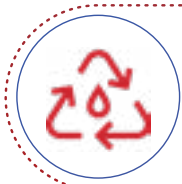
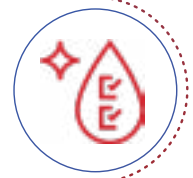
3. Engineering

4. Project Execution



5. Start-Up

6. Commissioning & Performance Testing



7. Rehabilitation,
Maintenance & Installation

Product

- Gravel By all Sizes, Underdrain Piping system.

Applications

- Sewage Treatment Plant (STP).



3. Pre-Filtration

Tikal places significant emphasis on pre-filtration in water treatment, considering it the initial stage of the treatment process. This stage involves subjecting raw water to preliminary filtration before undergoing further treatment steps. The primary goal is to remove larger particles, debris, and impurities, minimizing the load on subsequent treatment components and optimizing their efficiency.

Key Aspects of Tikal Pre-filtration system

1. Particle Removal:

Pre-filtration focuses on the removal of relatively larger particles from the raw water. This can include debris such as sand, and other suspended solids. The removal of these particles is essential to prevent clogging, abrasion, and interference with the performance of downstream treatment components.

2. Protective Role:

The primary function of pre-filtration is to protect sensitive equipment and processes further along in the treatment train. By removing larger particles early in the process, pre-filtration helps prevent damage to pumps, valves, membranes, and other components that may be susceptible to fouling or blockage.

3. Preservation of Treatment Efficiency:

Pre-filtration contributes to the overall efficiency of the water treatment plant by preventing the negative impacts of large particles on subsequent treatment steps. Without pre-filtration, the accumulation of debris could reduce the effectiveness of coagulation, sedimentation, filtration, and disinfection processes.

4. Variety of Filtration Methods:

Pre-filtration can be achieved using various filtration methods. The choice of the pre-filtration method depends on factors such as the characteristics of the raw water, the desired level of particle removal, and the specific requirements of the downstream treatment processes.

5. Adjustable Filtration Levels:

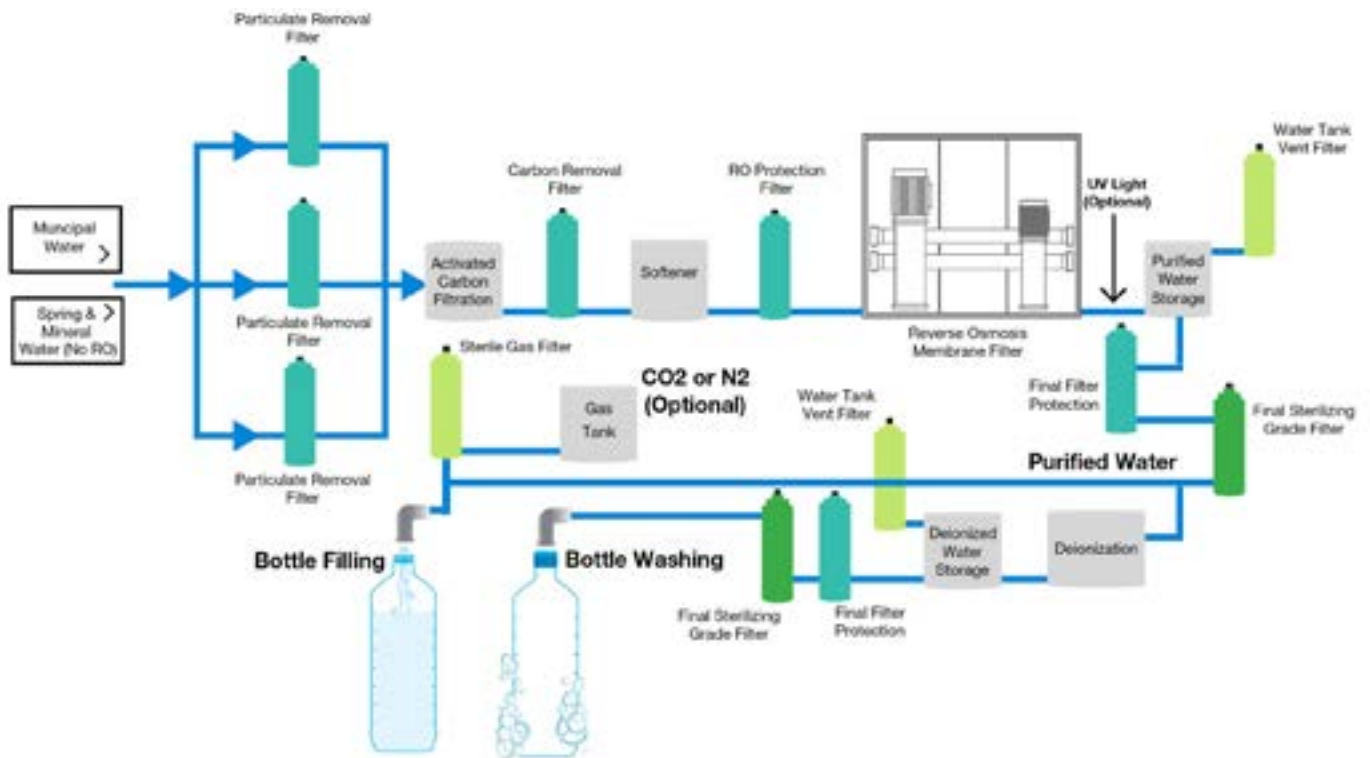
Pre-filtration systems often allow for the adjustment of filtration levels based on the size of particles to be removed. This adaptability ensures that the pre-filtration system can be customized to suit the specific needs of the water source and the treatment plant.

6. Simple Design and Maintenance:

Pre-filtration systems are generally designed to be simple, robust, and easy to maintain. Regular maintenance tasks may include cleaning or replacing filters to ensure continued effectiveness.



Applications of Tikal Pre-filtration systems



1. Surface Water Treatment

Commonly applied in water treatment plants sourcing water from surface water bodies like rivers, lakes, or reservoirs to remove natural debris and larger particles.

2. Groundwater Treatment

Even in groundwater treatment, pre-filtration is employed to remove any sediment or debris that may be present, ensuring high-quality water.

3. Industrial Water Treatment

Used in industries to protect equipment like pumps, heat exchangers, and membranes from damage caused by suspended solids in the water.

4. Municipal Water Treatment

Implemented before primary treatment processes in municipal water treatment plants, ensuring the efficiency of subsequent treatment steps.

5. Seawater Desalination

Crucial in seawater desalination plants to remove large particles, organic matter, and marine debris before subjecting water to processes like reverse osmosis.

Tikal's Multi-Media Filtration System for Iron and Magnesium Removal

Tikal also provide Removing both iron and magnesium from water in a single system: involves selecting or designing a water treatment solution that effectively addresses the unique challenges posed by these contaminants. Here's an overview of a potential system that combines the removal of iron and magnesium:

1. System Components

- **Multi-Media Filters**

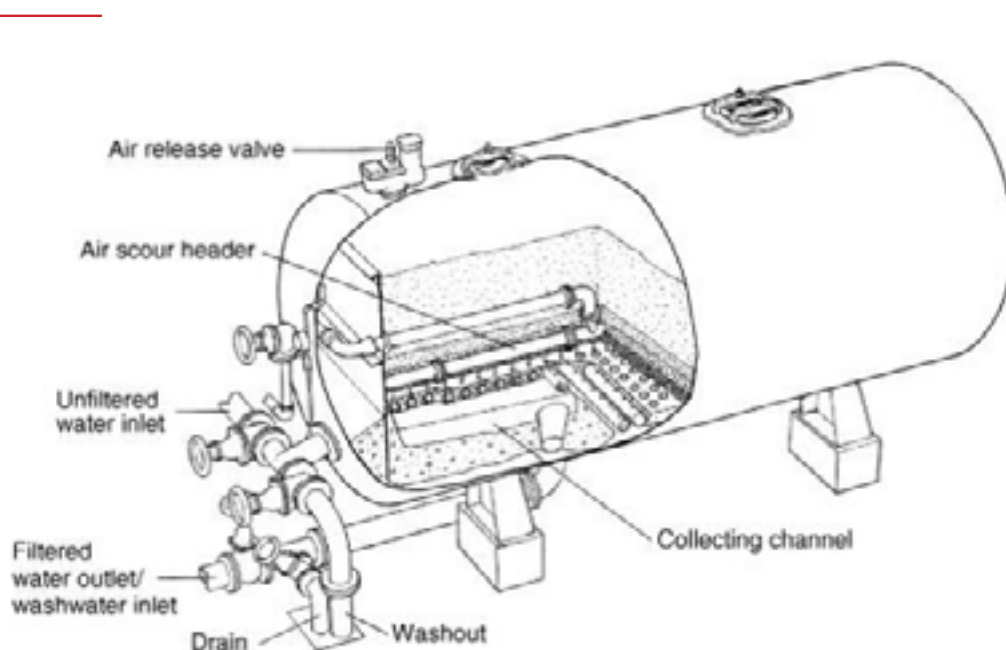
A multi-media filter system is designed to incorporate various filtration media with different characteristics. Common media include anthracite coal, sand, and garnet, each serving a specific purpose in the filtration process.

- **Automatic Backwashing System**

To maintain the efficiency of the multi-media filters, an automatic backwashing system is integrated. This system periodically reverses the flow of water to flush out accumulated particles and prevent clogging.

- **Chemical Injection System**

Depending on water conditions, a chemical injection system may be included to enhance the removal efficiency. For example, aeration followed by the addition of an oxidizing agent like chlorine or potassium permanganate can help in the oxidation of iron.



2. Operational Process

- **Pre-Filtration**

Raw water enters the multi-media filter system, passing through layers of different filtration media. This initial filtration stage helps in the removal of larger particles and suspended solids.

- **Iron Removal**

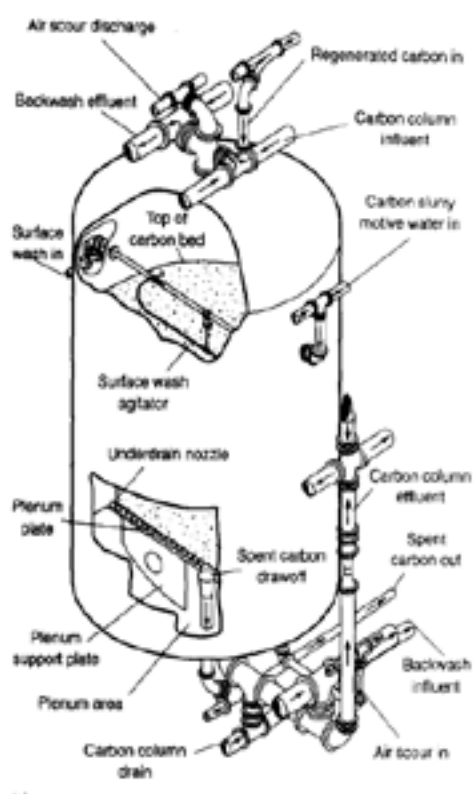
Iron in the water can exist in both ferrous (dissolved) and ferric (oxidized) forms. The multi-media filter system, with its combination of media, can effectively capture both forms of iron. Oxidizing agents added upstream or within the system aid in converting ferrous iron to ferric iron for better filtration.

- **Magnesium Removal**

The same multi-media filtration process can contribute to the removal of magnesium, as it effectively captures a range of contaminants. However, for enhanced magnesium removal, ion exchange resins or other specific media may be incorporated.

- **Backwashing**

The automatic backwashing system initiates periodic cleaning cycles. This prevents the accumulation of iron and magnesium particles on the media and ensures continuous and efficient operation.



3. System Considerations

- **Water Analysis:**

A detailed water analysis is crucial to understanding the concentration of iron and magnesium, as well as other water quality parameters. This analysis guides the selection of appropriate media and treatment methods.

- **pH Adjustment:**

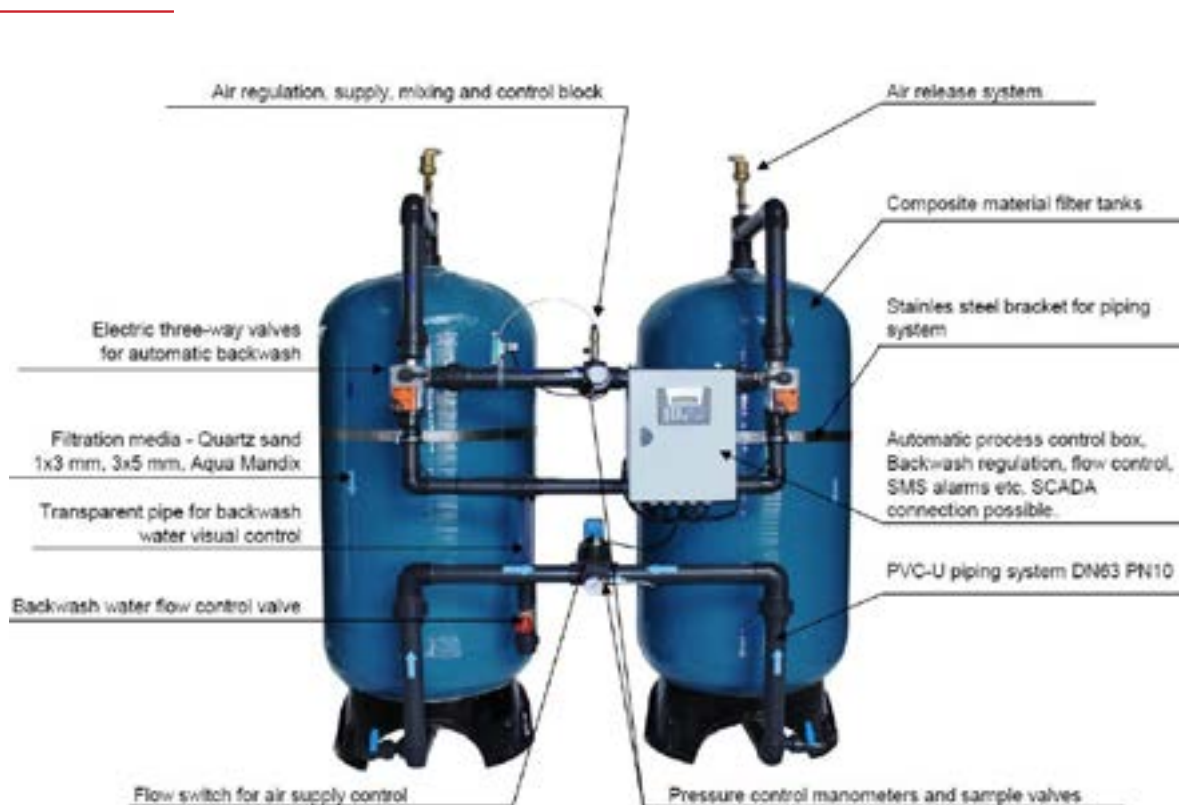
The pH level of the water is a critical factor for both iron and magnesium removal. If necessary, a pH adjustment system may be included to optimize the treatment process.

- **System Sizing:**

The size and capacity of the multi-media filtration system should be appropriately determined based on the flow rate and the desired level of contaminant removal.

- **Monitoring and Maintenance:**

Regular monitoring of system performance and water quality is essential. Maintenance activities, such as media replacement and backwashing system checks, should be carried out as needed.



4. Removing Fe & Mn Advantages

- **Comprehensive Treatment:**

The multi-media filtration system provides a comprehensive solution for the removal of both iron and magnesium, offering versatility and adaptability.

- **Efficiency:**

By combining various filtration media and incorporating automatic backwashing, the system maintains high efficiency in capturing and removing contaminants.

- **Scalability:**

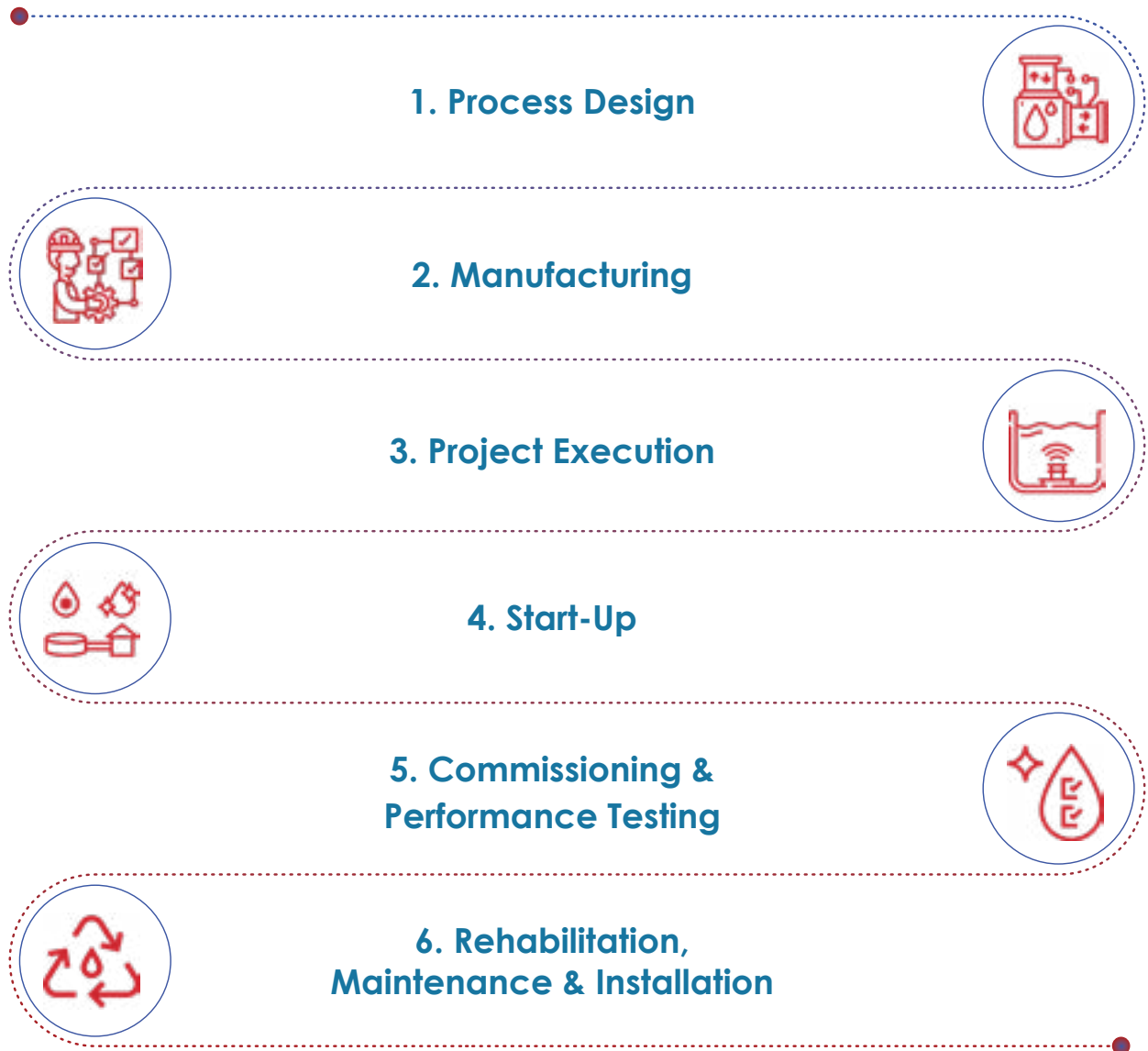
The system can be designed to scale for different capacities, making it suitable for a range of water treatment applications.

- **Cost-Effective:**

Combining multiple treatment processes in one system can be more cost-effective than implementing separate systems for iron and magnesium removal.



Tikal's Multi-Media Filtration System for Iron and Magnesium Removal Service | Product Offering



Product

Pressure vessel, FRP vessel, Nozzle System, cartridge filter (PVC, St.st), Cartridge membrane, Media, Carbon, Piping system, control Head, control panels, dosing pump, dosing tank.



4. Tertiary Treatment

Tikal Tertiary Treatment System Overview:

At Tikal, our Tertiary Treatment System represents the pinnacle of water treatment excellence, providing a meticulous and advanced approach to ensuring the highest water quality standards. This final stage in the treatment process follows primary and secondary treatments, focusing on removing residual contaminants and impurities. Tertiary treatment is especially important for meeting stringent water quality standards, environmental regulations, and producing water suitable for specific reuse applications.

Components and Processes of Tikal Tertiary Treatment

1. Filtration

- Our Tertiary Filtration employs cutting-edge methods, including sand filtration, microfiltration, and membrane filtration, enhancing the removal of suspended solids and microorganisms for unparalleled water clarity.

2. Chemical Treatment

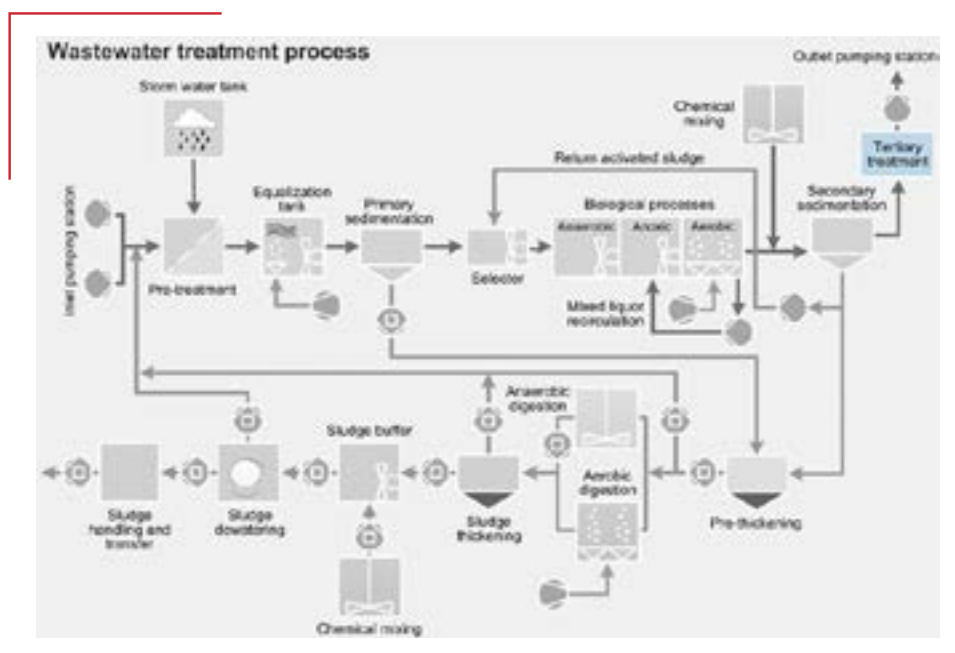
- Through precise chemical dosing, Tikal's Tertiary Chemical Treatment eliminates remaining colloidal and dissolved impurities, guaranteeing water quality that surpasses health and safety standards.
- To removal of remaining colloidal and dissolved impurities, as well as in disinfecting the water to ensure it meets health and safety standards.

3. Nutrient Removal

- Targeted processes for nutrient removal, addressing phosphorus and nitrogen, play a vital role in preventing issues like eutrophication, reflecting Tikal's commitment to environmental stewardship.

4. Advanced Oxidation Processes (AOPs):

- Employing Advanced Oxidation Processes such as ozonation or UV-based treatments, Tikal ensures the degradation of trace organic pollutants, leaving water purified to the highest standards.
- To break down persistent organic compounds that may remain after secondary treatment, ensuring high water purity.



Tertiary Treatment Advantages

Water Reuse

Tikal's Tertiary Treatment System facilitates water reuse for various non-potable applications, including industrial processes, irrigation, and environmental restoration, contributing to sustainable water management.

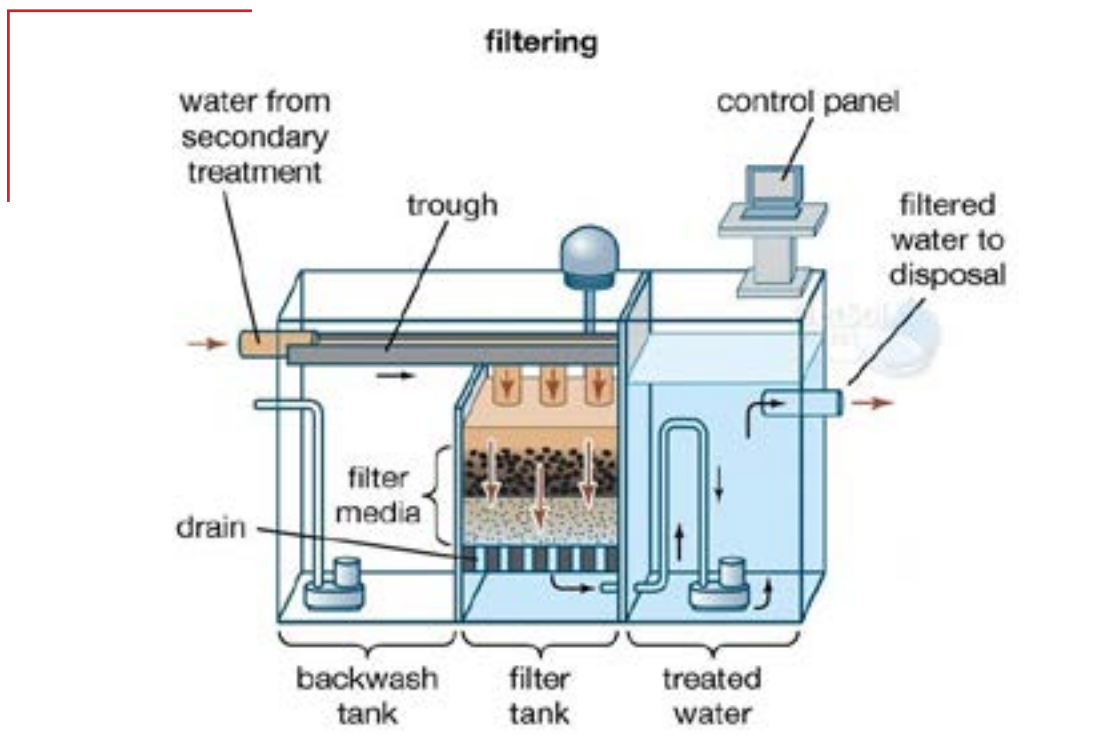
Compliance with Regulations

Essential for compliance with the most stringent water quality regulations and standards established by environmental agencies and health authorities, reflecting Tikal's commitment to excellence.



Environmental Protection

By meticulously removing additional contaminants, our Tertiary Treatment System safeguards the environment, ensuring treated effluent meets and exceeds stringent quality standards before release into natural water bodies.



Applications of Tertiary Treatment

- **Wastewater Reclamation:**

Widely employed in wastewater reclamation, Tikal's Tertiary Treatment ensures that treated effluent is of the highest quality, suitable for non-potable reuse applications, reducing the demand on freshwater resources.

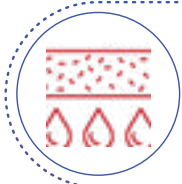
- **Advanced Water Treatment Plants:**

Integral to advanced water treatment plants serving urban areas, our Tertiary Treatment System guarantees that treated water meets and exceeds the highest quality standards for direct or indirect potable reuse.

- **Industrial Water Treatment:**

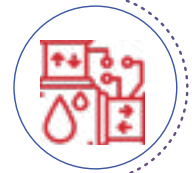
Industries with specific water quality requirements, such as electronics or pharmaceuticals, rely on Tikal's Tertiary Treatment for achieving the desired water purity essential for their critical processes.

Tertiary Treatment Service | Product Offering



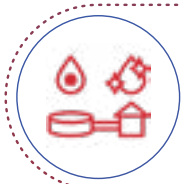
1. Technology Identification

2. Process Design



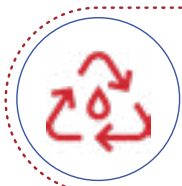
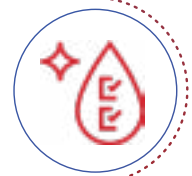
3. Engineering

4. Project Execution



5. Start-Up

6. Commissioning & Performance Testing



7. Rehabilitation, Maintenance & Installation

Product

Sand filters, Pressure vessel, FRP vessel, Nozzle System, cartridge filter (PVC, St.st), Cartridge membrane, Media, Carbon, Piping system, control Head, control panels, Chemical dosing unit.



5. Ion Exchange System

Tikal's Ion Exchange System is a cutting-edge water treatment solution that involves the dynamic exchange of ions in solution with ions attached to a solid resin, providing versatility and reliability. This process is widely applied for various purposes, such as water softening, deionization, de-alkalization, and demineralization.

Components and Processes

- **Ion Exchange Resin**

The ion exchange resin is the central component of the system. It is typically in the form of small beads or resin bed.

- **Exchange vessel**

The resin is contained in a column or vessel through which the water passes.

- **Regeneration System**

For water softening, a regeneration system involves flushing the resin with a brine solution to replace captured hardness ions with sodium ions.



There is a lot of applications for ion exchange; Tikal provide (Softening, Deionization, De-alkalization, Demineralization) for example:

5.1 Water Softener System

Tikal water softener system is a specific type of ion exchange system designed to reduce water hardness by exchanging calcium and magnesium ions with sodium ions.

It utilizes a resin bed in a tank to perform the ion exchange, and the system is regenerated periodically to maintain its effectiveness.

• Components and Processes

• Resin Tank

Contains the ion exchange resin.

• Brine Tank

Stores a solution of salt (sodium chloride) used for regeneration.

• Control Valve

Manages the flow of water through the system and initiates regeneration.



Tikal system Features

- **Automatic Regeneration**

Water softeners often have automatic regeneration cycles based on water usage and hardness levels.

- **Salt-Based Process**

Uses salt to create a brine solution for regeneration.

Water Softener System Advantages



Scale Prevention

Effectively prevents scale buildup in pipes, water heaters, and appliances.

Improved Soap Efficiency

Softened water enhances the efficiency of soaps and detergents.

Applications

- **Residential Use**

Widely adopted in homes for improved water quality in bathing, cleaning, and appliance longevity.

- **Commercial and Industrial Use**

Applied in businesses and industries to protect equipment and processes from scale accumulation.

5.2 Deionization System

Tikal's Deionization (DI) System, also known as demineralization, removes ions from water, producing nearly pure water through advanced ion exchange processes to replace both positively and negatively charged ions with hydrogen (H⁺) and hydroxyl (OH⁻) ions, resulting in deionized water.

- **Components and Processes**

- **Cation Exchange Resin**

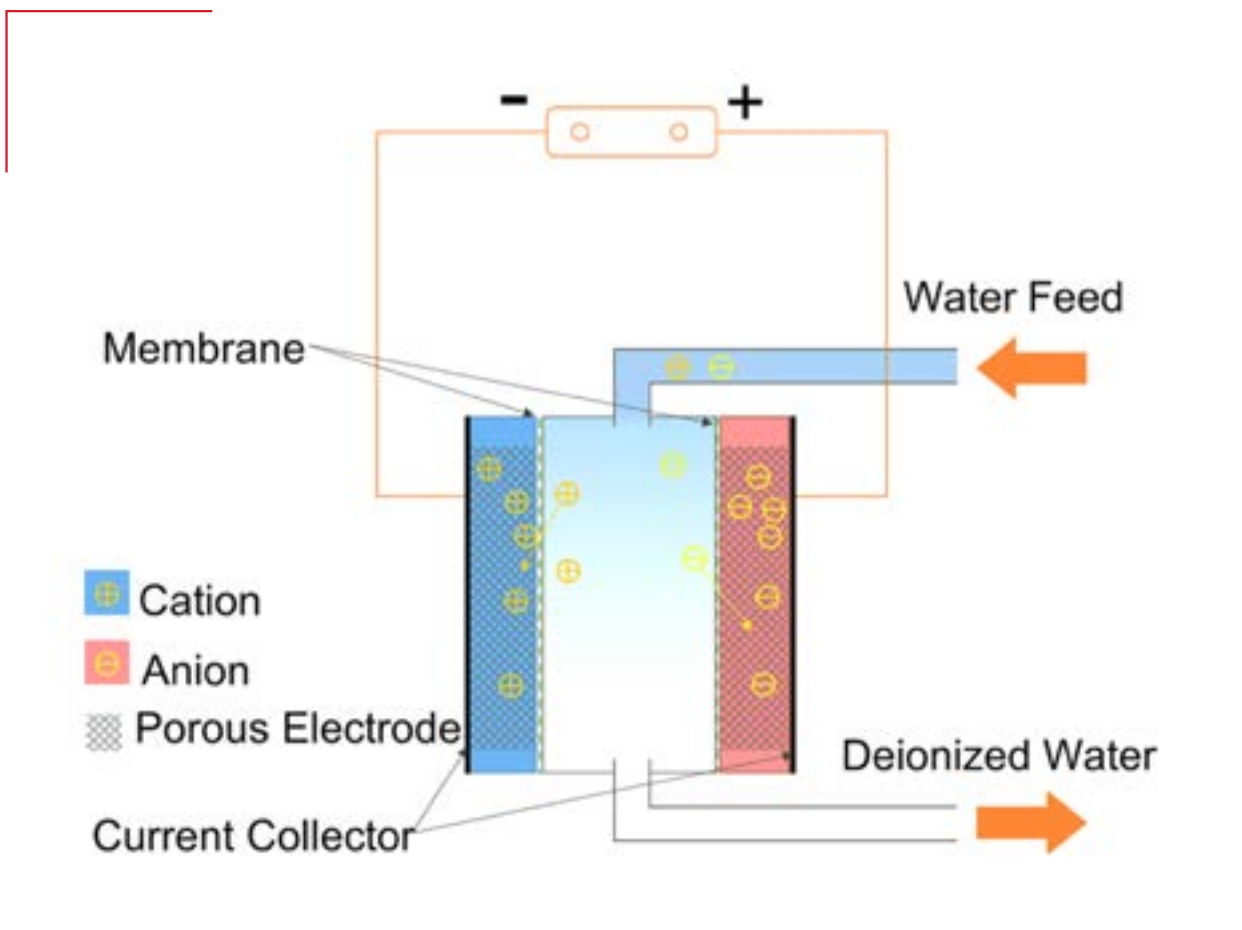
Removes positively charged ions (cations).

- **Anion Exchange Resin**

Eliminates negatively charged ions (anions).

- **Mixed Bed Resin**

Combines cation and anion resins in a single vessel for achieving the highest purity.



Tikal system Features

- **Dual-Ion Removal**

Deionization removes both cations and anions, ensuring superior water purity.

- **Salt-Based Process**

DI systems can operate continuously until resin exhaustion.

Deionization System Advantages



High Purity

Produces water with extremely low ion concentrations, meeting the most demanding purity standards.

Versatility

Widely used in laboratories, electronics manufacturing, and applications requiring ultra-pure water.

Applications

- **Laboratories**

Removes positively charged ions (cations).

- **Electronics Industry**

Eliminates negatively charged ions (anions).

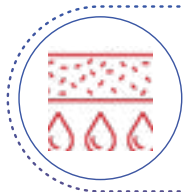
- **Power Plants**

Combines cation and anion resins in a single vessel for achieving the highest purity.



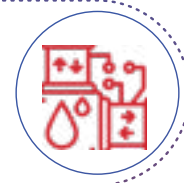
Deionization System

Service | Product Offering



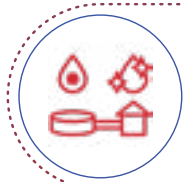
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2. Process Design



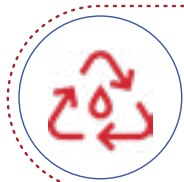
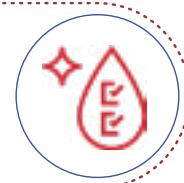
3. Engineering

4. Project Execution



5. Start-Up

6. Commissioning & Performance Testing

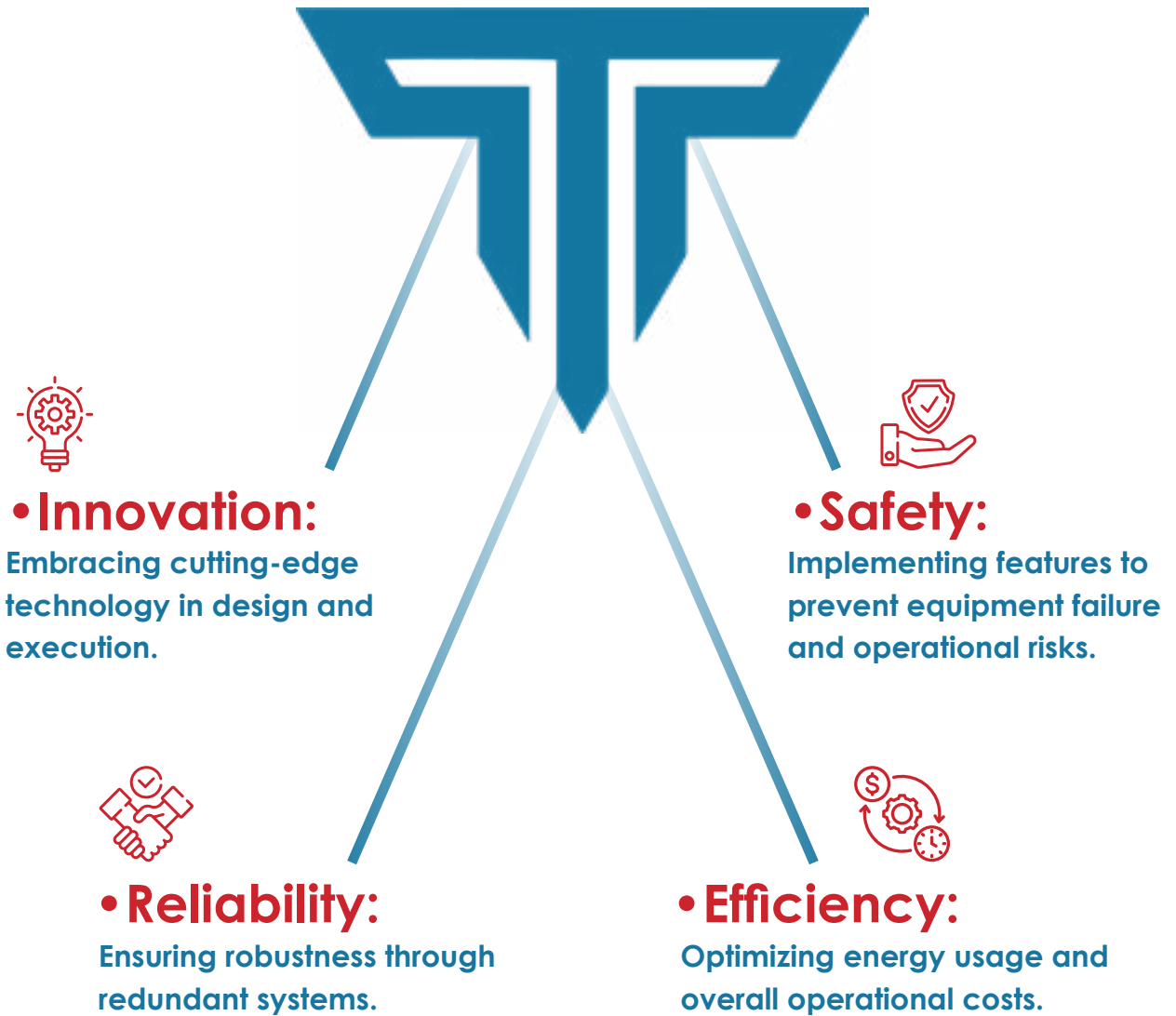


7. Rehabilitation,
Maintenance & Installation

Product

Pressure vessel, FRP vessel, Nozzle System, Ion exchange resin, Media, Carbon, Mixed bed, Piping system, control Head, control panels, regeneration system.

Why Choose Tikal?



Tikal other Solutions?



Your Challenges Are Our Concerns.

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