



ENV SAFE SOLUTIONS



SUSTAINBLE. INNOVATIVE WATER SOLUTIONS



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1. ABOUT US:

ENV Safe Solutions is a leading environmental engineering company specializing in Wastewater Solutions and Recycling Solutions. We design, build, and maintain state-of-the-art Wastewater Treatment Plants (WWTPs) for industrial, municipal, and residential applications using proven and advanced treatment technologies.

With a strong focus on sustainability, performance, and compliance, we help our clients minimize their environmental footprint, reduce operational costs, and achieve water reuse efficiency.

Founded by seasoned technocrats with over a decade of experience in water and wastewater treatment, and effluent treatment plant (ETP) technologies, ENV brings deep domain expertise and a progressive mindset to every project. As a technology-driven organization, we possess comprehensive knowledge of both conventional and advanced treatment methodologies. Our portfolio includes cutting-edge solutions in waste management, recycling, effluent treatment, and wastewater applications—designed to meet the evolving needs of industrial and municipal clients. At ENV, our mission is to minimize environmental impact while contributing to a cleaner, safer planet. We are committed to delivering cost-effective, safe, and responsible solutions—consistently and reliably. What sets us apart is our personalized approach. We carefully integrate technologies to suit each client's unique requirements. Our design and engineering team combines technical skills with practical insight to develop economical, user-friendly systems and equipment that ensure.

- Proven performance
- Reduced maintenance
- Extended plant life

ENV is your trusted partner in building sustainable infrastructure for a better tomorrow.

2. MISSION:

- To design and deliver customized WWTP solutions suited to industry-specific needs.
- To integrate advanced treatment technologies that promote recycling and zero discharge.
- To provide comprehensive service support from concept to commissioning and beyond.
- To drive sustainability through continuous innovation and responsible practices.



3. WHY CHOOSE ENV:

At ENV Safe Solutions, we go beyond conventional wastewater treatment — we deliver smart, sustainable, and future-ready solutions. Our strength lies in the perfect balance of technical expertise, innovation, and customer focus.

➤ **Proven Technical Expertise:**

Our team consists of qualified environmental and process engineers with extensive experience in designing, executing, and maintaining WWTPs and ETPs across diverse sectors. We specialize in advanced systems such as ASP, SBR, MBR, and ZLD technologies, ensuring every project meets performance and compliance goals.

➤ **2. End-to-End Project Capability:**

We oversee the complete project lifecycle—from initial concept to commissioning and long-term operation. Our integrated services span Engineering & Procurement (E&P), Erection & Installation, Commissioning and Operation & Maintenance (O&M).

➤ **3. Technology-Driven Innovation:**

We integrate cutting-edge process technologies and automation systems (SCADA, PLC, IoT monitoring) to enhance operational efficiency, reduce energy use, and optimize water recovery — providing clients with both sustainability and cost advantage.

➤ **4. Customized and Sustainable Solutions:**

No two projects are the same. We tailor each system based on client requirements, effluent characteristics, and space constraints — ensuring maximum efficiency, minimum footprint, and compliance with local and national discharge norms.

➤ **5. Commitment to Quality and Compliance:**

Every system we deliver adheres to CPCB/SPCB regulations and international standards. We use top-quality components, rigorous quality checks, and validated process designs for assured, long-term plant performance.

➤ **6. Strong After-Sales and Support Network:**

We believe our responsibility doesn't end with commissioning. Our dedicated O&M and service teams provide regular plant audits, troubleshooting, and optimization support — ensuring uninterrupted performance and client satisfaction.

➤ **7. Focus on Sustainability and Water Reuse:**

Our core mission is to promote resource recovery and zero liquid discharge (ZLD) through water recycling and reuse. Every ENV Safe Solutions project contributes to reducing freshwater dependency and protecting the environment.

➤ **8. Client-Centric Approach:**

We work closely with our clients, offering transparent communication, competitive pricing, and flexible engagement models. Our repeat clientele reflects the trust we've earned through consistent delivery and long-term partnerships.



4. CORE VALUES:

- Innovation – Adopting next-generation treatment technologies.
- Sustainability – Promoting water reuse and energy-efficient systems.
- Integrity – Upholding transparency and accountability in all projects.
- Quality – Ensuring reliability, durability, and regulatory compliance.
- Customer Commitment – Long-term partnership and service excellence.
- Optimization – Optimize the system across money, electrical and Manpower.

5. OUR COMMITMENT:

- On time completion of project.
- Guaranteed Plant performance.
- Optimization of capital cost of Project.
- Complete Documentation on submission of Project & Training.
- After commission services & trouble shooting.

6. EFFLUENT TREATMENT PLANT(ETP):

Effluent Treatment Plants are designed to treat industrial wastewater and remove harmful contaminants before safe discharge or reuse. We provide customized ETP solutions suitable for diverse industries like pharmaceuticals, chemicals, food processing, textile, automobile, and engineering sectors.

We provide complete turnkey solutions including design, supply, erection, and commissioning of Wastewater Treatment Plants (WWTPs). Our scope includes delivering all technical documents, compliance reports, drawings, manuals, and certifications required to support approvals from CPCB and State Pollution Control Boards.

Our services include complete Primary, Biological, and Tertiary/Advanced Treatment Systems, delivering end-to-end wastewater treatment solutions tailored to meet regulatory and operational requirements.

❖ OUR SERVICES INCLUDES:

1. PRIMARY TREATMENT
2. BIOLOGICAL TREATMENT
3. TERTIARY TREATMENT

1. PRIMARY TREATMENT:

It is the first and most essential stage in an Effluent Treatment Plant (ETP). It focuses on removing suspended solids, grit, oil & grease, and reducing the initial pollutant load before the effluent enters biological or tertiary processes. In industries where wastewater contains High Total Dissolved Solids (HTDS), special treatment steps are included at the primary stage to reduce the impact on downstream processes.



- Screening & Grit Removal
- Oil & Grease Separation
- Equalization & pH Correction
- Flash Mixer
- Coagulation & Flocculation
- Neutralization & sludge removal
- Settling or clarification to remove salt-laden sludge

2. **BIOLOGICAL TREATMENT:**

It is the core process of wastewater purification, where microorganisms naturally break down organic pollutants, nutrients, and biodegradable compounds. Our biological treatment systems are engineered for high efficiency, low operating cost, and maximum reliability, ensuring compliance with CPCB/SPCB discharge standards. Our biological treatment options include SBR, Activated Sludge Process, and Extended Aeration technologies. These systems use microorganisms to break down organic impurities, ensuring highly efficient and stable wastewater treatment suitable for various industrial and municipal applications

➤ **Sequential batch reactor (SBR):**

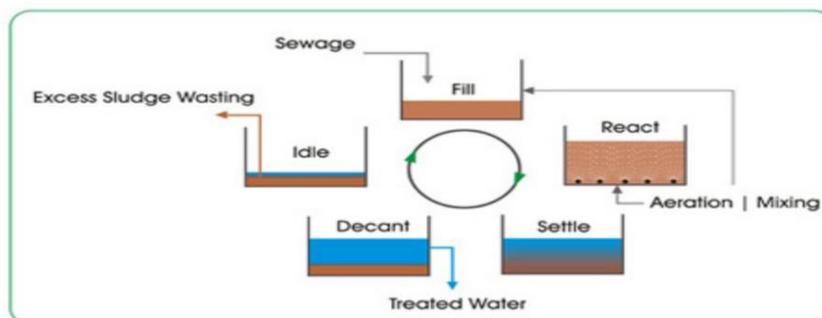
A time-sequenced activated sludge process that provides Feeding, aeration, settling, and decanting in a single tank.

Features:

- Automated and energy-efficient operation
- High removal of BOD, COD, and TSS
- Handles shock loads effectively

Applications: Municipal sewage, townships, housing projects and pharmaceutical industries.

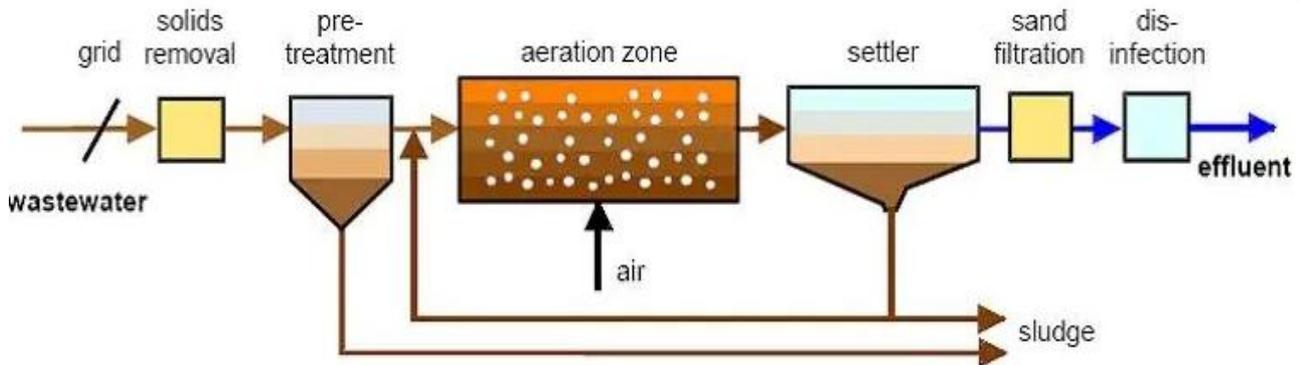
SBR Operating Principle





➤ **Activated sludge process (ASP):**

ASP is one of the most widely used biological treatment technologies in wastewater treatment plants. ASP uses a controlled population of microorganisms (biomass) to break down organic pollutants present in sewage or industrial wastewater.



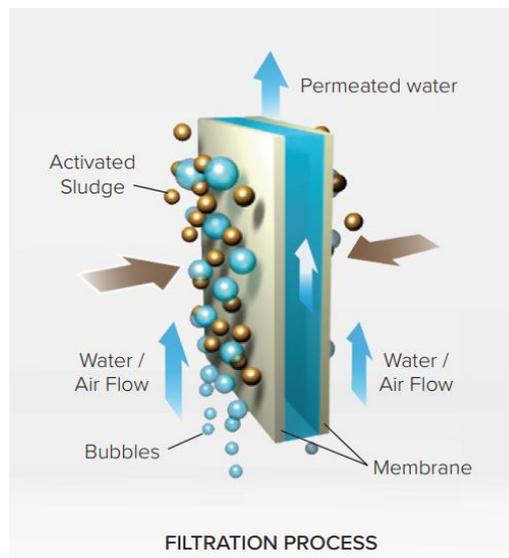
➤ **Membrane bioreactor (MBR):**

Combines biological treatment with membrane filtration (microfiltration or ultrafiltration) to produce high-quality treated water.

Features:

- Excellent effluent quality suitable for reuse
- Compact design and reduced sludge generation
- Ideal for space-constrained areas

Applications: Commercial buildings, hospitals, high-end residential projects and industrial domestic wastewater.





➤ **Zero liquid discharge (ZLD) systems:**

An advanced solution that ensures no wastewater leaves the facility, focusing on water recovery and reuse.

Features:

- Water recovery rate up to 95%
 - Compliance with stringent environmental norms
- Applications: Textile, chemical, and pharmaceutical industries

3. Tertiary & Advanced Treatment:

Tertiary treatment is the final polishing stage in wastewater treatment, designed to produce high-quality treated water suitable for reuse or safe discharge. This stage removes fine particles, dissolved impurities, pathogens, salts, and residual organic contaminants that remain after biological treatment. Our advanced tertiary systems include TFM (Tubular Film Membrane) and RO (Reverse Osmosis) technologies for superior purification

➤ **Tubular Filtration Membrane (TFM):**

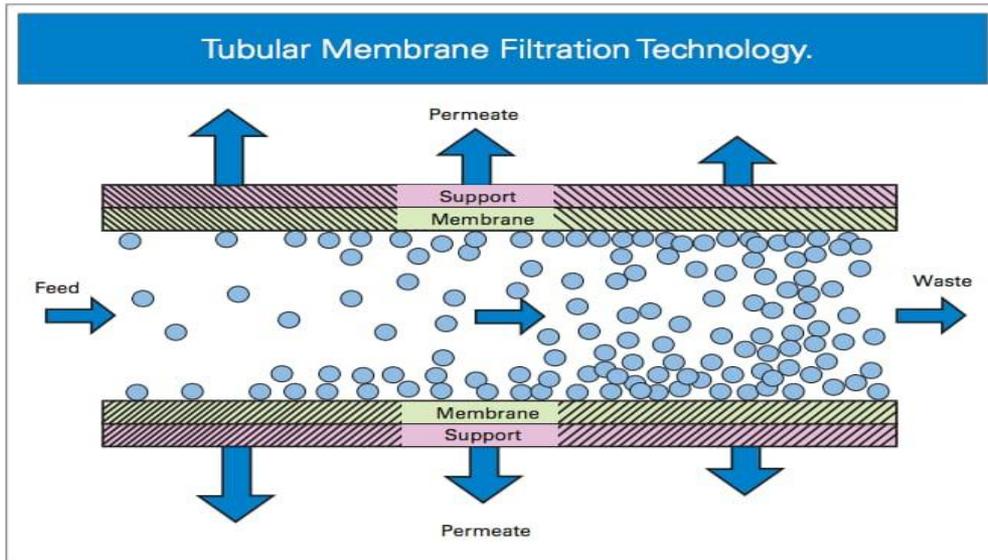
The Tubular Filtration Membrane (TFM) system is an advanced membrane-based separation technology designed to treat wastewater streams containing high suspended solids, oil, grease, and other difficult-to-filter materials. It operates on the principles of crossflow filtration, where the wastewater flows tangentially across the surface of the tubular membranes, minimizing fouling and maintaining consistent flux.

Each membrane module consists of hollow tubes made from durable polymeric or ceramic materials. The feed passes through the inner bore of the tubes under moderate pressure, allowing clean permeate (filtrate) to pass through the membrane wall while retaining larger particles, colloids, and macromolecules inside the tube.

Depending on pore size, tubular systems can function as Microfiltration (MF) or Ultrafiltration (UF) units. They are ideal for treating pharmaceutical, chemical, and high-TDS industrial effluents, where conventional flat-sheet or spiral-wound membranes are prone to clogging.

Features:

- Capable of handling high solids and viscous effluents
- Low fouling tendency due to crossflow operation
- High recovery rate and consistent performance
- Easy cleaning and maintenance (CIP compatible)
- Suitable as a pre-treatment stage before Reverse Osmosis (RO) or Multiple Effect Evaporator (MEE) systems.



➤ **Reverse Osmosis (RO):**

The Reverse Osmosis (RO): RO System is an advanced membrane filtration technology used to remove dissolved salts (TDS), minerals, heavy metals, organic impurities, and microorganisms from treated wastewater. RO provides high-purity water suitable for industrial reuse, meeting stringent quality standards and supporting Zero Liquid Discharge (ZLD) requirements.

Feed water is passed through a semi-permeable membrane under high pressure, allowing only water molecules to permeate while rejecting salt and impurities. The system typically consists of a pre-treatment stage, high-pressure pump, membrane assembly, permeate line, and concentrate discharge line.





7. High TDS (HTDS) Wastewater Treatment Technology:

Pharmaceutical manufacturing involves a wide range of chemical synthesis, formulation, and cleaning operations that use large quantities of water and various raw materials, solvents, and salts. During these processes, different wastewater streams are generated, including both Low Total Dissolved Solids (LTDS) and High Total Dissolved Solids (HTDS) effluents.

The HTDS wastewater originates primarily from:

- Chemical synthesis and reaction processes where inorganic salts, acids, and alkalis are used.
- Solvent recovery units that discharge concentrated streams containing dissolved organics.
- Equipment and floor washings where concentrated residues mix with wash water.
- Utility operations such as boiler blowdown, cooling tower bleed, and RO reject streams.

These wastewater streams contain high concentrations of dissolved salts, organics, and sometimes trace solvents, making them unsuitable for biological treatment. Discharging such effluents without proper treatment can lead to severe soil and groundwater contamination, toxicity to microorganisms, and non-compliance with environmental norms.

We offer HTDS treatment facility, that includes neutralization, coagulations, flocculation and pH correction and mainly to remove the Suspended solids

High Total Dissolved Solids (HTDS) wastewater treatment system is designed to handle effluents containing elevated concentrations of dissolved salts, organic matter, and other impurities that cannot be effectively treated by conventional biological methods.

The process begins with equalization and pH correction, ensuring consistent flow and optimum conditions for downstream equipment. The pre-treated wastewater is then subjected to primary filtration and oil-grease removal to eliminate suspended solids and impurities.

Next, the influent is processed through the filtration to remove high concentrated suspended solids through Clarifier/Filter press/Screw press.

Next, the clarified wastewater is processed through a Multiple Effect Evaporator (MEE) system, where water is evaporated under controlled temperature and vacuum conditions. The evaporation process concentrates the dissolved solids into a brine while producing high-quality condensate, which is further treated with LTDS stream in biological system to remove the high COD & BOD to re-use internally to minimize freshwater consumption.



8. MULTI EFFECT EVAPORATOR (MEE):

A Multiple Effect Evaporator (MEE) is an advanced system used for the concentration and volume reduction of wastewater or process liquids by evaporating water content using steam energy. It is widely

used in industries such as pharmaceuticals, chemicals, textiles, food processing, and wastewater treatment.

➤ MEE Services, Technical Support & Troubleshooting:

We offer comprehensive services for Multiple Effect Evaporators (MEE), ensuring smooth, efficient, and long-term operation of your system. Our team of qualified engineers provides end-to-end technical support, including installation, commissioning, performance optimization, and preventive maintenance.

We specialize in troubleshooting operational issues such as low evaporation rate, scaling, foaming, vacuum problems, and condensate contamination. Through on-site inspection and performance audits, we identify root causes and implement effective, energy-efficient solutions to restore system efficiency.

Our services help clients achieve maximum recovery, minimal downtime, and compliance with environmental standards, ensuring that your MEE system operates at peak performance throughout its lifecycle.





9. SERVICES OFFERED:

- Design, Engineering, Erection & Commissioning of WWTPs and ETPs
- Operation & Maintenance (O&M) Contracts
- Plant Upgradation & Retrofitting for efficiency enhancement
- Water Recycling & Reuse Systems
- EPC & Turnkey Project deliveries
- Automation & SCADA Integration
- Environmental Audits & Compliance Support.
- Trouble shootings & Operation & maintenance of Multi- Effect Evaporators (MEE).

10. STAGE WISE PARAMETERS OF PROPOSED SYSTEMS:

To ensure effective design and performance evaluation of the proposed Wastewater Treatment Plant (WWTP), a stage-wise parameter analysis has been carried out. This analysis helps in understanding the variation in key water quality parameters such as pH, TSS, TDS, BOD, COD, and oil & grease at each treatment stage.

By comparing the influent and effluent characteristics across different units, the efficiency of each process — from pre-treatment to tertiary and final polishing — can be assessed. The results of this analysis provide a scientific basis for process optimization, equipment sizing, and compliance assurance with regulatory discharge norms. Stage wise parameters list as follows:

S. No	Parameter	Before HTDS treatment	After HTDS treatment	MEE Condensate/ Biological inlet	Biological Out-let/TFM In-let	TFM Out-let/RO Inlet	RO Outlet
1	pH	2 - 10	7-7.5	6-7.5	6-7.5	6-7.5	6-7.5
2	TDS (Mg/l)	50000	50000	1500	1500	1500	<200
3	COD (Mg/l)	60000-80000	60000-80000	~15000	<2500	<2000	<200
4	BOD (Mg/l)	30000-40000	30000-40000	~6000	<800	<600	<50
5	NH ₃ -N(Mg/l)	~800	~800	~200	<50	<50	<50
6	TSS	~2000	<100	~300	<250	<10	<10



11. PHARMACEUTICAL PROCESS EQUIPMENT:

Along with wastewater treatment plants, ENV Safe Solutions is also engaged in supply and service of a wide range of pharmaceutical process equipment designed to meet the stringent requirements of the pharma and chemical industries. Our product range includes:

- **Reactors:** Reactors are engineered for precise control of temperature, pressure, and agitation to ensure consistent and efficient chemical processing. They are constructed in SS304 / SS316 / SS316L with jacketed or limpet coil designs for heating and cooling applications. Equipped with mechanical seals and variable speed agitators, they ensure uniform mixing, durability, and compliance with GMP standards.
- **Receivers:** Receivers are designed for hygienic liquid handling in processing lines. They are fabricated from high-quality stainless steel, with options for vent filters, sight glasses, and bottom valves. The smooth internal surface finish ensures no contamination or residue retention, supporting sterile operations.



REACTOR



RECIEVER



- **Storage Tanks:** Storage tanks are designed to meet the rigorous hygiene and pressure requirements of pharmaceutical plants. Available in vertical and horizontal configurations, with dished ends, insulation, and sanitary fittings. The tanks are electropolished internally for easy cleaning and long service life.
- **4. Heat Exchangers:** Our shell & tube and plate-type heat exchangers are designed for maximum thermal efficiency with minimum energy consumption. Built using SS316L for corrosion resistance and long durability, they ensure precise temperature control in critical pharmaceutical operations.



STORAGE TANK



HEAT EXCHANGER



- **Leaf Filters:** Leaf filters are designed for batch and continuous filtration. Featuring a vertical or horizontal configuration, these systems allow efficient filtration with easy cake discharge. The design minimizes product loss and ensures high throughput with reduced maintenance downtime.
- **Shifter:** Vibratory sifters ensure precise screening of powders and granules. With stainless steel sieves and dust-free operation, they prevent contamination and provide consistent particle sizing. Compact, efficient, and easy to clean, they comply with GMP design norms.



VIBRO SHIFTER



LEAF FILTER



- **Tray Dryers:** Tray Dryers use uniform air circulation to dry granules, powders, and crystals. Designed with SS304/316 chambers and digital temperature control, they ensure efficient and easy cleaning.
- **FBD (Fluid Bed Dryer):** Fluid Bed Dryers use fluidization technology to suspend materials in an air stream, ensuring fast and even drying. Fitted with HEPA filters, PLC controls, and explosion-proof designs, they ensure product safety and process efficiency.
- **RCVD:** Rotary cone vacuum dryers combine vacuum drying and mixing in a rotating conical body, ensuring uniform drying and low contamination risk. Designed with cGMP features, SS316L construction, and hermetically sealed bearings, they deliver superior performance for high-value products.



TRAY DRYERS



FBD



RCVD



- **Miller:** Milling machines are used to achieve uniform particle size by breaking down materials through controlled mechanical force. Designed for continuous or batch operation, mills ensure efficient grinding with minimal heat generation, maintaining material quality.
- **Vacuum Tray Dryers:** These are operated under reduced pressure to dry materials at low temperatures, preserving the chemical and physical properties of sensitive products. Equipped with SS trays and shelves, they ensure uniform heating and effective moisture removal.



MILLER



VACCUM TRAY DRYERS

We ensure that all equipment is fabricated using high-quality stainless-steel materials, adhering to GMP standards, and tested for performance, durability, and compliance with industry regulations. Our solutions are tailored to support both formulation and bulk drug manufacturing operations with efficiency and reliability.



12. OUR SUPPLIERS:

- Air Blowers/Compressors – A1 Blowers
- Dewatering System – A1 Blowers
- TFM Membranes - Pentair, Netherlands
- Electro-mechanical Equipment - Kirloskar, Naga & Jhonson

13. INDUSTRIES SERVED:

Our wastewater treatment solutions are designed to cater to a diverse range of industries, each with unique, effluent characteristics and treatment requirements. We provide custom-engineered systems that ensure environmental compliance, operational reliability, and sustainable water management.

Below are the major industries we serve, along with a brief explanation of their wastewater nature and treatment approach:

➤ **Pharmaceutical Industry:**

High TDS, solvents, organic compounds, and process chemicals.

Treatment Approach: Segregation into LTDS and HTDS streams, followed by biological treatment, RO, and evaporation (MEE + ATFD) to achieve Zero Liquid Discharge (ZLD).

➤ **Municipal & Domestic Wastewater:**

Wastewater Characteristics:

Organic matter, nutrients (N, P), and suspended solids.

Treatment Approach: Conventional STP systems using SBR, MBBR, or MBR technology for biological purification and water reuse.

Our Commitment is We specialize in delivering end-to-end wastewater management solutions from design and engineering to installation, commissioning, and operation ensuring that each system meets regulatory standards and contributes to sustainable industrial development.



14. OUR TEAM EXPERIENCE:

At ENV Safe Solutions, our team brings together a wealth of knowledge and hands-on experience in designing, engineering, commissioning, and operating Wastewater Treatment Plants (WWTPs) across multiple sectors.

With over 10 years of combined experience, our engineers, environmental specialists, and technicians have successfully executed projects for industrial, commercial, and municipal clients, ensuring compliance with the latest pollution control board norms and environmental standards.

Our expertise covers the entire spectrum of wastewater management, including:

- Process Design & Engineering – Expertise in conventional and advanced treatment technologies such as ASP, MBBR, SBR, MBR, RO, and ZLD systems.
- Customized Solutions – Tailor-made designs based on effluent characteristics and client requirements for optimal performance and cost efficiency.
- Installation & Commissioning – End-to-end project execution ensuring smooth startup and stable operation of treatment systems.
- Operation & Maintenance (O&M) – Skilled O&M teams managing day-to-day plant performance, troubleshooting, and efficiency optimization.
- Upgradation & Revamping – Experience in upgrading existing plants to meet stricter discharge norms and improve treatment efficiency.

Each project is driven by our core values — technical excellence, environmental responsibility, and client satisfaction. Our multidisciplinary team ensures that every WWTP we deliver is efficient, sustainable, and future-ready.



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