



## **EUROFIX™ TECHNOLOGY MEETS THE NEW EFFLUENT QUALITY NORMS OF CPCB/DPCC**

Rehabilitation & Upgradation of existing conventional activated sludge based 45 MGD (204.3mld) sewage treatment plant at Kondli, Delhi, by Integrated Fixed Film (IFAS) technology with euroteck-euroclean fixed type IFAS media to achieve treated effluent parameters BOD/TSS = 10 PPM/10 PPM

### **1. BACKGROUND**

Kondli Sewage Treatment Plant (STP), with a capacity of 45 MGD (204.3 MLD), is one of several sewage treatment facilities operating in New Delhi -India for the treatment of municipal wastewater. The plant was commissioned in 2013 based on the Activated Sludge Process (ASP) technology.

With the introduction of revised discharge norms by the Central Pollution Control Board (CPCB) and Delhi Pollution Control Committee (DPCC), the treatment requirements have become more stringent. The updated standards mandate not only the efficient removal of organics (BOD, COD) and Total Suspended Solids (TSS) but also require the incorporation of biological nutrient removal (BNR) processes—targeting nitrogen and phosphorus and disinfection to ensure compliance with the new effluent quality norms.

### **2. PROBLEM STATEMENT & ROOT CAUSE**

CPCB and DPCC have issued revised discharge standards for STPs to ensure better environmental compliance and protection of water bodies .

The new norms not only target lower permissible levels of BOD, COD, and TSS, but also emphasize the need for nutrient removal (Nitrogen and Phosphorus) and pathogen control through disinfection.

## The New CPCB/DPCC Effluent Discharge Norms

Parameter	Existing Norm (mg/L)	Revised Norm (mg/L)
BOD (3-day @ 27°C)	≤ 30	≤ 10
COD	≤ 250	≤ 50
TSS	≤ 100	≤ 10
Total Nitrogen	Not specified	≤ 10
Total Phosphorus	Not specified	≤ 1
Fecal Coliform	Not specified	≤ 1000 MPN/100 mL

### 3. CHALLENGES IN EXISTING STP TO MEET NEW DISCHARGE STANDARDS

With the introduction of revised effluent discharge norms by CPCB and DPCC, the existing Activated Sludge Process (ASP)-based treatment configuration at the Kondli STP (45 MGD) faces multiple operational and infrastructural challenges. These challenges hinder the plant's ability to comply with the required limits for BOD, COD, TSS, nutrients (Nitrogen and Phosphorus), and pathogen removal.

#### The observed Challenges in Existing STP are:

- Absence of Nitrogen Removal System
- Absence of Phosphorus Removal Mechanism
- Space Constraints for Expansion
- Inadequate Disinfection Provision:
- Inefficient TSS Removal and Sludge Management
- Lack of Efficient Aeration System
- Limited Execution Window for Upgradation

### 4. PROPOSED UPGRADATION STRATEGY – IMPLEMENTATION OF EUROFIX™ TECHNOLOGY

In order to overcome the operational and process limitations of the existing Activated Sludge Process (ASP) and to meet the revised discharge standards set by CPCB/DPCC, it is proposed to upgrade the existing Kondli STP (45 MGD) by integrating EuroFix™ - A2O proprietary technology of EuroTeck into the current treatment system.

The EuroFix™-A2O process technology offers a hybrid biological treatment solution, combining both suspended growth (activated sludge) and attached growth (biofilm on carrier media) within the same reactor. This approach enhances biological activity, improves nutrient removal efficiency, and minimizes the need for large additional civil structures—making it ideal for sites with space and time constraints such as the Kondli STP.

## 5. CONCEPT OF EUROFIX™ TECHNOLOGY

The EuroFix™ system involves the installation of specialized Proprietary media carriers into the existing aeration tanks. These carriers provide an increased surface area for the growth of biofilm-forming microorganisms. The co-existence of suspended biomass and attached biofilm enhances overall microbial diversity and process stability.

### Key features of the EuroFix™ process:

- Hybrid system combining conventional ASP and biofilm reactor advantages.
- Enhanced nitrification and denitrification due to increased biomass retention.
- Reduced sludge generation and improved settleability in secondary clarifiers.
- No major modification to existing reactor volumes or flow paths.

## 6. EUROFIX™ PROCESS CONFIGURATION FOR KONDLI STP

To achieve biological nutrient removal (BNR) and comply with the revised discharge standards, the existing activated sludge technology will be transformed to EuroFix™-A2O process the following modification will be carried out as follows:

- **Anaerobic Zone:** create anaerobic zone to facilitate biological phosphorus release.
- **Anoxic Zone:** create anoxic zone for denitrification
- Aerobic Zone with EuroFix™ Media
- **Secondary Clarification:** The existing secondary clarifiers will continue to be used, with possible optimization for improved TSS removal.
- **Disinfection:** Installation of UV disinfection units.

## 7. ADVANTAGES OF EUROFIX™ UPGRADATION

- Enhanced Nitrogen and Phosphorus Removal
- No Major Civil Expansion Required
- Improved Process Stability
- Increased Treatment Capacity
- Energy and Sludge Optimization

## 8. EXPECTED EFFLUENT QUALITY AFTER EUROFIX™ IMPLEMENTATION

Parameter	Existing Performance (mg/L)	Expected After EuroFix™ Upgradation (mg/L)	CPCB/DPCC Standard (mg/L)
BOD (3-day @ 27°C)	20–30	≤10	≤10
COD	80–120	≤50	≤50
TSS	40–60	≤10	≤10
Total Nitrogen	>25	≤10	≤10
Total Phosphorus	>3	≤1	≤1
Fecal Coliform (MPN/100 mL)	>10 <sup>5</sup>	≤1000	≤1000

## 9. COST AND BENEFIT ANALYSIS

Category	Conventional Expansion	EuroFix™ Retrofit
Capital cost	100% baseline	~45% of new tank construction
Construction time	12–18 months	4–6 months
Land requirement	40%	0% (existing footprint)
Operation & Maintenance	Higher (due to more tanks)	Similar to existing system

**Payback Period: <3 years** through avoided civil works and improved process efficiency.

## 10. LESSONS LEARNED

- EuroFix™ is highly effective for retrofit situations where civil expansion is not feasible.
- Proper aeration design is critical — undersized blowers can limit performance.
- Biofilm management (occasional backwashing or air scouring) prevents clogging.
- Process monitoring with DO and NH<sub>4</sub> sensors improves operational control.

## 11. ESG IMPACTS

Category	EuroFix™ Contribution to ESG
<b>Environmental</b>	Lower carbon footprint, improved water quality, efficient resource use
<b>Social</b>	Community health protection, job creation, minimal construction disruption
<b>Governance</b>	Better compliance, transparency, and fiscal responsibility

## 12. CONCLUSION

The EuroFix™ retrofit provides a technically viable, cost-effective, and space-efficient solution for upgrading the Kondli STP (45 MGD) to meet the new CPCB/DPCC effluent discharge norms. The integration of BNR capability, enhanced aeration efficiency, and effective disinfection under the EuroFix™ framework ensures sustainable operation, improved effluent quality, and environmental compliance with minimal disruption to ongoing treatment operations. The project demonstrates that EuroFix™ Proprietary technology of Euroteck is a robust, adaptable, and sustainable solution for upgrading underperforming wastewater treatment plants in space-constrained environments.