



# Identifying best available technologies for decentralized wastewater treatment and resource recovery for India

D2.3 Pilot 3 implementation  
report



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## 1 Context information and overview of the pilot

This pilot will implement two Mars Biokube plants based on SAF technology and encompasses a septic tank, buffer tank, biozone and clarifier.

- Septic Tank - The raw wastewater gravitates to the septic tank in which the settleable suspended solids are settled pre-pairing the wastewater for further treatment
- Buffer Tank - The external pump well evens out fluctuating volumes of wastewater from the source ensuring constant batches of wastewater to the treating microorganisms.
- Biozone - In the biozone microorganisms perform degradation of the organic load in the incoming wastewater to the required levels. The chamber consists of submerged bubble diffuser aerated filters.
- Clarifier-In the clarifier, bio sludge – the by-product from the biological treatment process – is settled and recirculated to the (1) septic tank by means of air lift pumps. This ensures less suspended solids in the outlet and continuous bio-sludge removal.

This packaged plant can treat wastewater for a variety of outlet demands. This can be changed depending on incoming water (this incoming water, the better treatment parameters are achieved) and the settings in the installed controller. Parameters include also possibility for removal of pathogen bacteria. This makes the system and the technology ideal for a university test environment also in regard to the United Nation SDG of giving access to water by reusing treated sewage water. BioKube systems are also unique in the respect that the technology can cope with large variations in the incoming water (hotels with off season for instance).

The two plants will be implemented at the following locations:

A Mars 3000 unit (7,5m<sup>3</sup>/day) has been piloted at B.Lal Institute of Biotechnology in Jaipur and a Mars 5000 unit (12,5m<sup>3</sup>/day) at the campus of the Central University of Rajasthan in Kishangarh for residential (domestic) wastewater. The reason of two pilots is to compare the performance under conditions of purely domestic (Kishangarh) and domestic mixed with clinical wastewater (Jaipur). Reuse of treated effluent is foreseen at the Kishangarh location.

Pilot 1: CURAJ (Kishangarh): 12.5m<sup>3</sup>/day campus domestic sewage

Pilot 2: B. Lal Campus (Jaipur): 7.5 m<sup>3</sup>/day - Mixed effluent from campus and pathlab.

## 2 Changes of the technology compared to the DOA

Scope/design has not changed.

## 3 Detailed design and project report (task a)

A detailed design of the unit was carried out by Biokube and the Indian SME Waterneer.

The dimensions of the Mars 4000 plant can be seen in the Figure below:

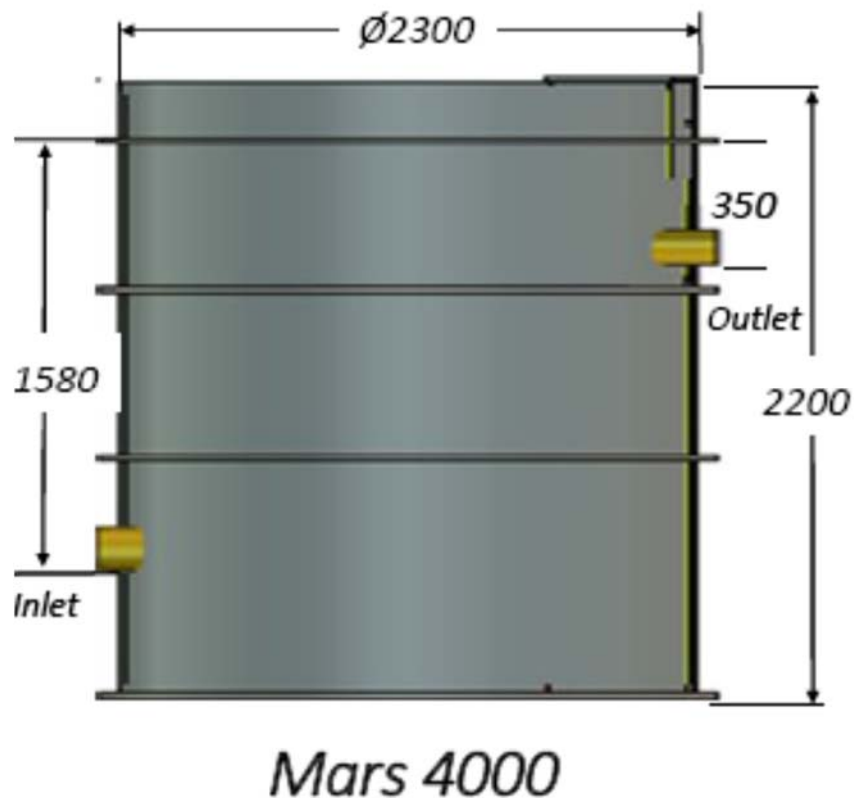


Figure above: Dimensions of Mars 4000 plant.

## 4 Detailed engineering design and construction (task b)

Detailed engineering design of the unit was carried out by the Indian SME Waterneer with support from Biokube. The detailed layout plans can be seen in the figures below:

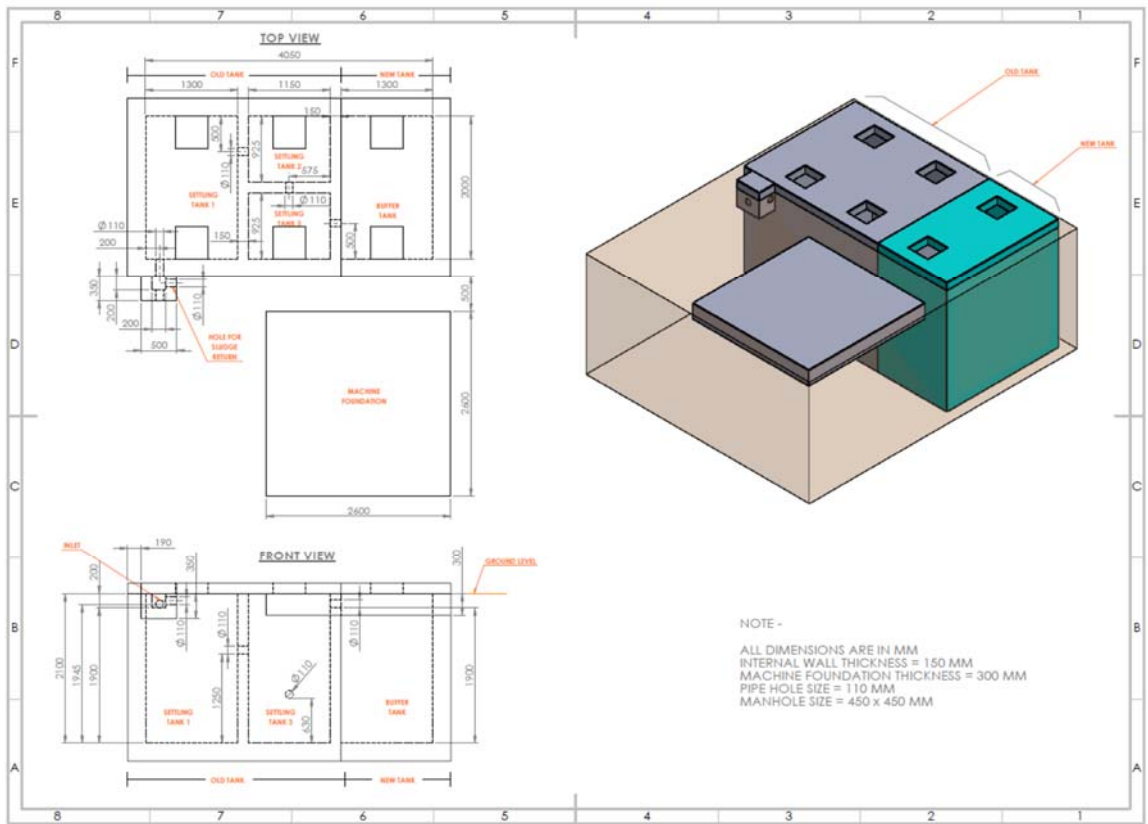


Figure above: Layout of Mars 4000 plant at B.Lal

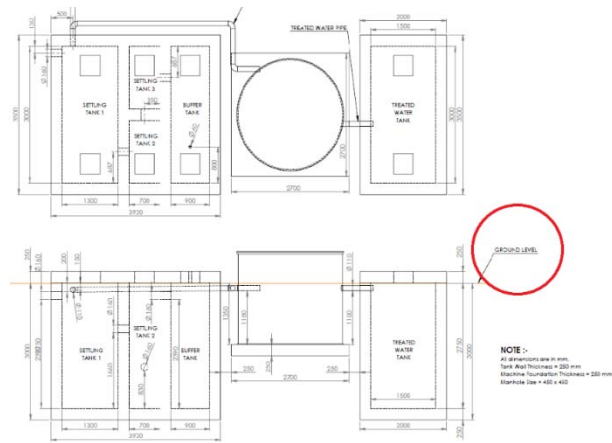


Figure above: Layout of Mars 4000 plant at CURAJ

## 5 Commissioning and start of operation (task c)



The pilot at B. Lal was commissioned on 21.01.2021 and plant started operating from that day onwards.

The pilot at CURAJ was commissioned on 28.07.2021.



Picture above: Mars 3000 plant implemented at B.Lal



Picture above: Mars 5000 plant implemented at CURAJ