



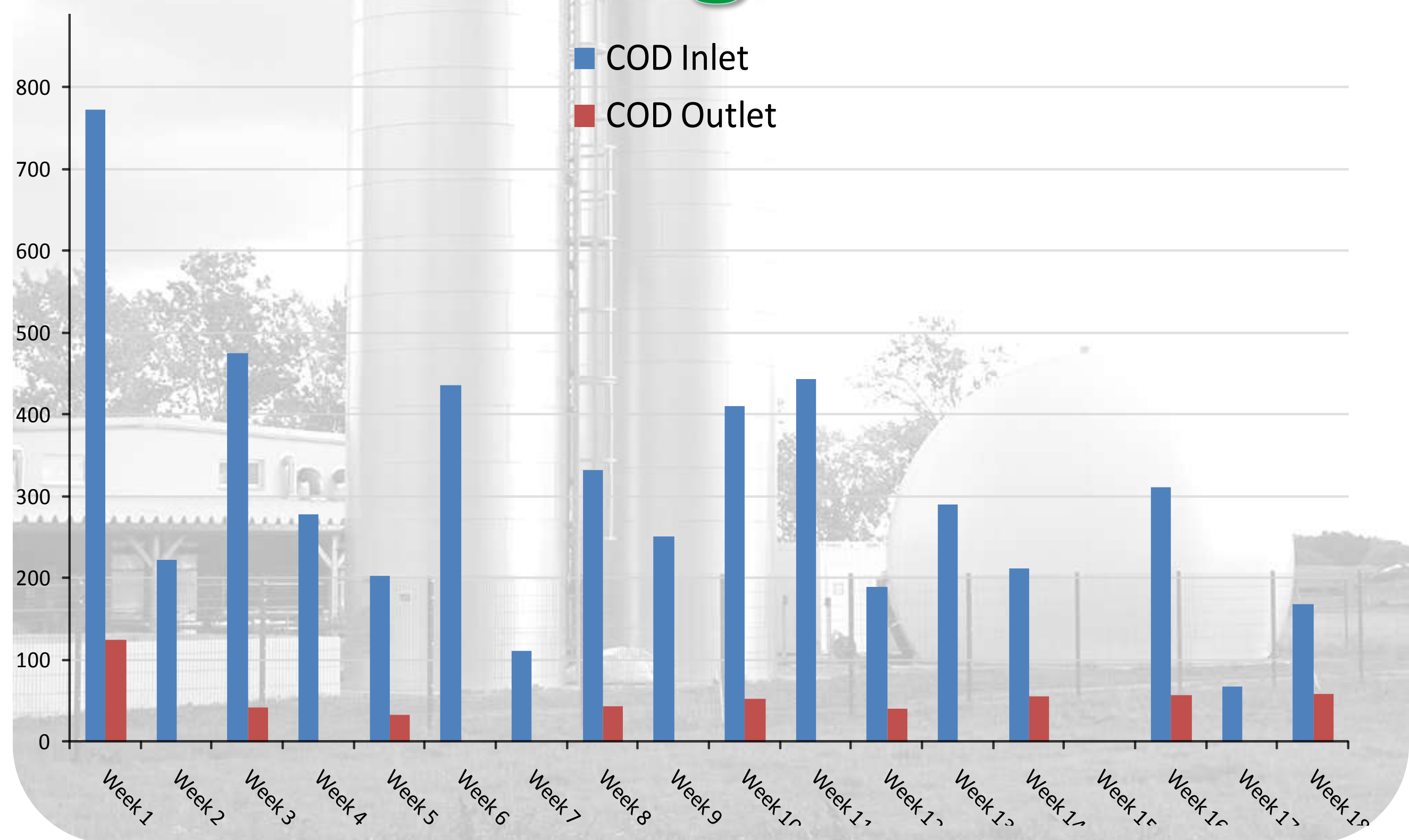
RESULTS OF MSABP™ PILOT PROCESS IN NEW WATER TECHNOLOGIES CENTER (CENTA)

The water flow between compartments is zig-zag, with each independently ventilated. The biomass is attached to the textile substrate.

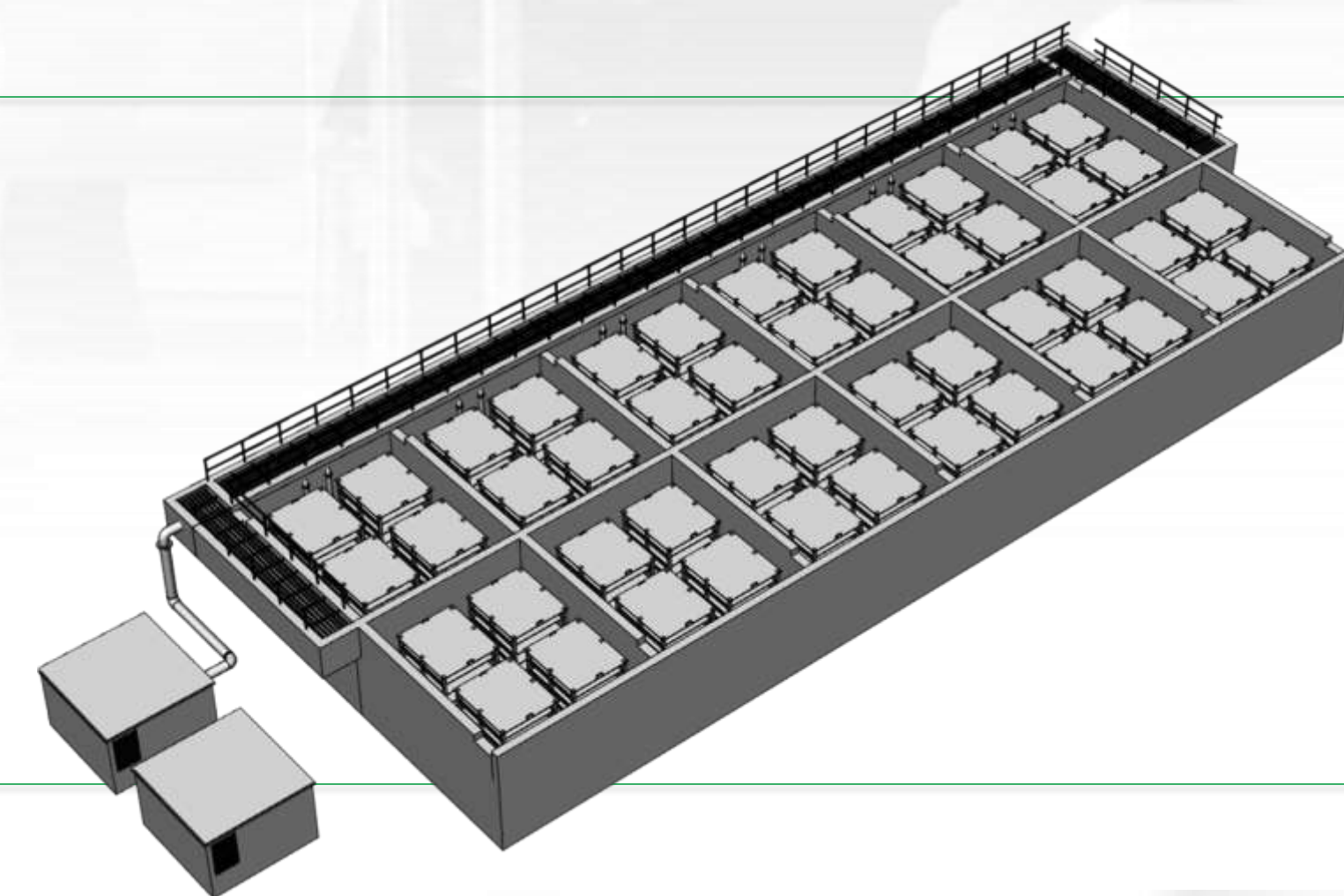
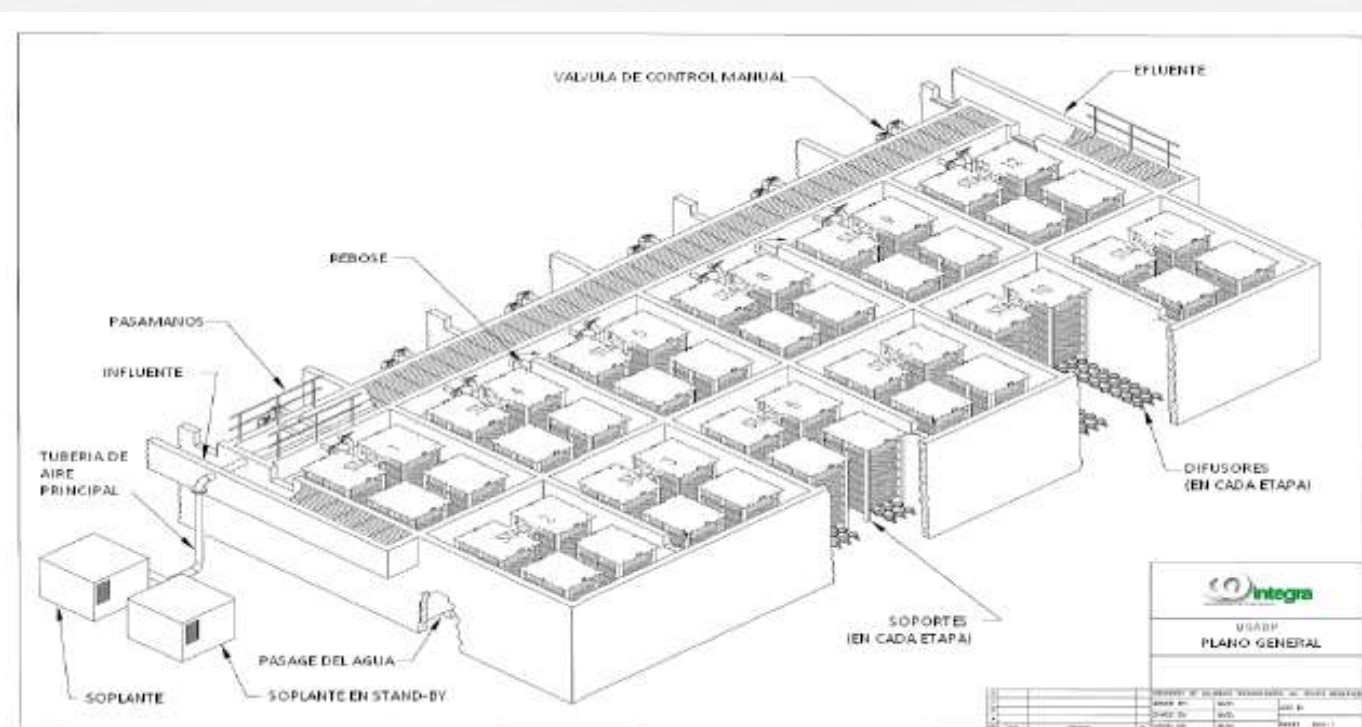
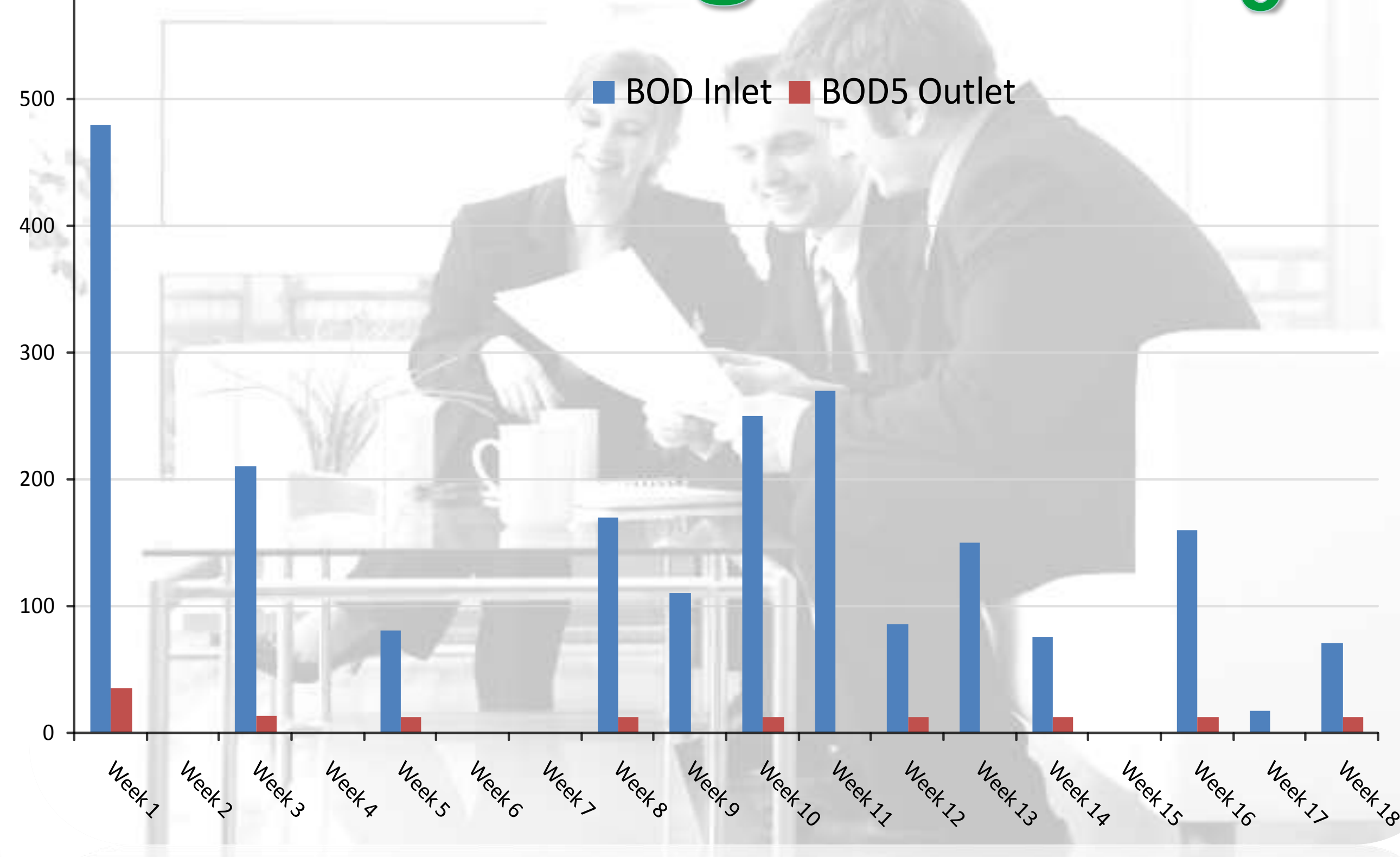
Flow: 3 m³/day
 Reactor volume: 3 m³
 Size: 2 x 1 x 1.5 m
 Construction materials: AISI 304
 Includes aeration blower
 Feed pump 380 / 6 kW.

For ease of transport and assembly, the plant is located within a container 20' (6 x 2.5 x 2.5 m)
 The pilot system is not designed for nutrient removal, being limited by the water column.

Sustained & stable removing of COD



Sustained & stable removing of DBO₅



Sustained reduction of suspended solids



Conclusions

- The system has an acceptable efficiency in removing organic matter (COD) with average values of this parameter according to Royal Decree Law 11/95.
- The system features a high efficiency in removing biodegradable organic matter (BOD₅) under all operating conditions studied.
- The system fails, in most cases, the limit for suspended solids, either in absolute or performance. However, it was found that the solids in the effluent of the system have a high mineral component.
- The system does not conform to the reference standard in the elimination of total nitrogen and total phosphorus, but has a high rate of nitrification (conversion of ammonia nitrogen to nitrate). It should be stressed that the prototype installed in the PECC is not designed for nutrient removal.
- MSABP unit has operated without sludge recirculation line and purge during the study period.
- Also, the maintenance staff by CENTA has included the routine inspection of the facilities to check their status. Additionally, technicians from Integra Solutions SL have made occasional visits (1 visit every 15 days or so).
- Finally, note that the aeration system is the only relevant electromechanical element in the whole process in terms of energy consumption is concerned, and the system works properly without biological or chemical additions.