

Feasibility for Omniprocessor establishment in Muttathara Sewage Treatment Plant, Trivandrum

Sheik Mohammed Shibl, Praveen Nagaraja and Sasanka Velidandla

Thiruvananthapuram's 107 MLD STP treats wastewater and faecal sludge, handling 90-100 trucks daily. Despite advanced treatment processes, sludge has been accumulating on-site for over 10 years due to a lack of demand for treated water and sludge. This has led to significant land loss at the STP premises. The feasibility to implement a climate resilient and energy neutral system is been studied for the Thiruvananthapuram STP.

AIM & OBJECTIVE OF THE STUDY

The aim of the study is to assess the feasibility of implementing the omniprocessor technology (a thermal technology) in 107 MLD Muttathara STP, Thiruvananthapuram.

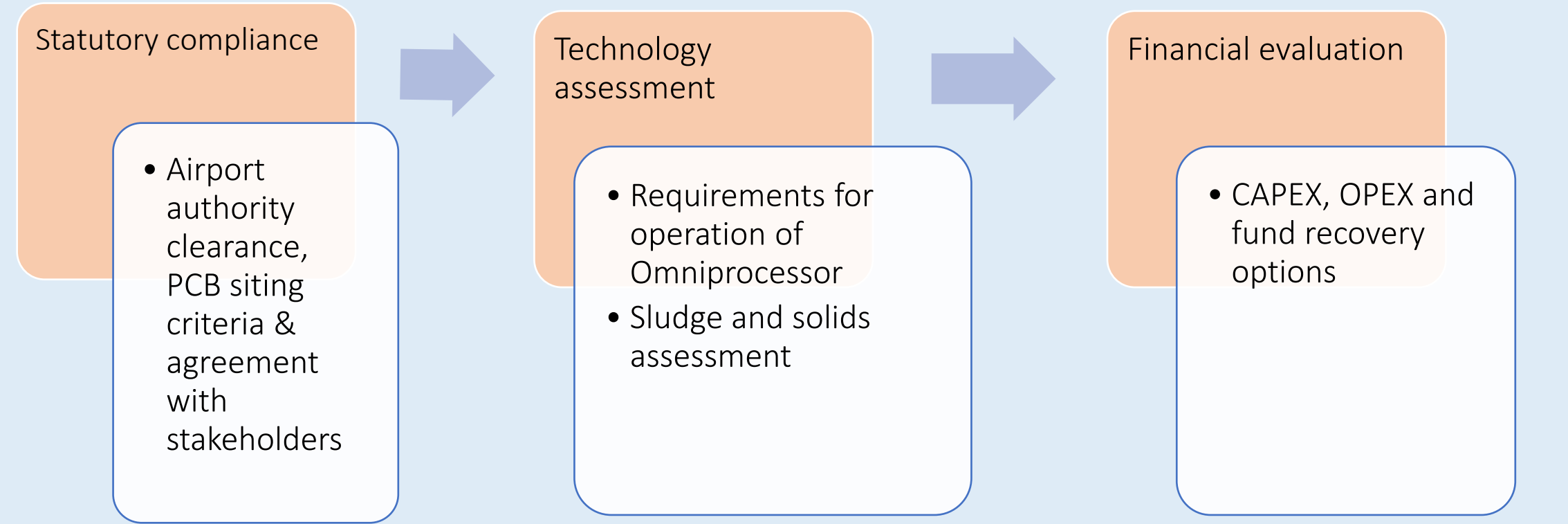
Objectives

- Evaluate technical aspects related to the integration of the Omni-processor with the existing STP infrastructure.
- Review statutory requirements and compliance with regulations for implementing the Omni-processor.
- Analyze financial viability, including costs, funding options, and potential savings from improved sludge management.
- Examine the overall sustainability of both STP operations and Omni-processor functioning for long-term sludge treatment and disposal.



Sludge Buildup in the STP premises

METHODOLOGY



STATUTORY COMPLIANCE

Airport Authority Clearance

Procedure for Operator Navigation Operation (PAN-OPS) & CNS criteria determined the allowable elevation is 46.37 m (AMSL) greater than required 33m height as per initial assessment

Kerala State Pollution Control Board siting criteria, water and air emission criteria

Site is away from all habitation and satisfies the standard of 25 log Q, where Q is the capacity.
Technology will comply all the discharge norms for treated water and air

Agreement with stakeholders

•Thiruvananthapuram corporation, Kerala Water Authority and implementing agency are to ink an agreement for commissioning and operation of the facility

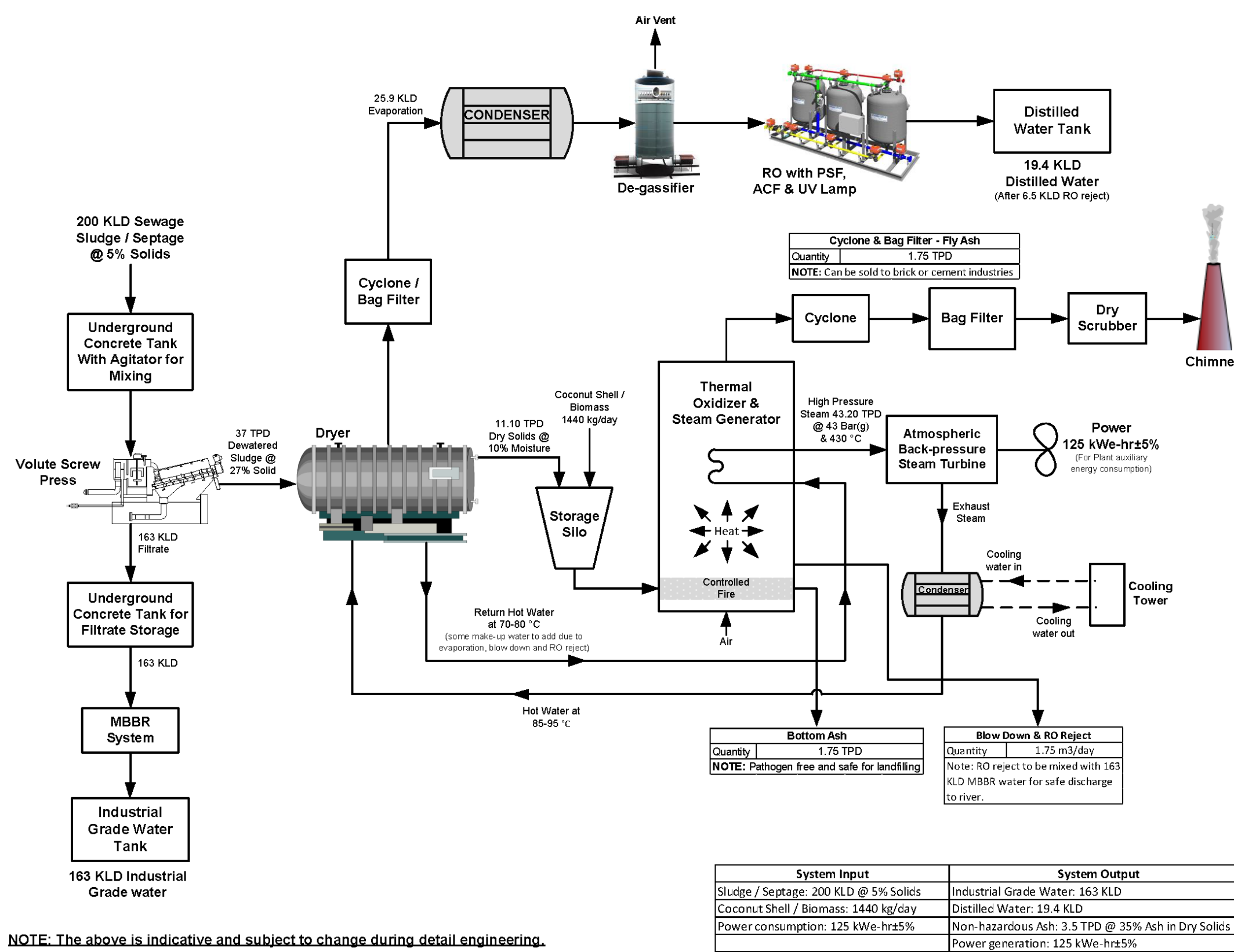
*Corporation has covered Containment, Emptying through licensed emptiers and Treatment through STP but, lacks solid treatment. It is an opportunity to close the loop in the waste management for the Corporation

STAKEHOLDERS INVOLVED

- Thiruvananthapuram Municipal Corporation – Owner of the STP and the land. Agency for funding operations
- Kerala Water Authority- Operating agency of the STP
- Implementing agency – Construction & commissioning of the project and operate & train an agency for operating the facility
- Suchitwa Mission and WASH Institute – Project Management Unit for Government & funder side

TECHNOLOGY ASPECT

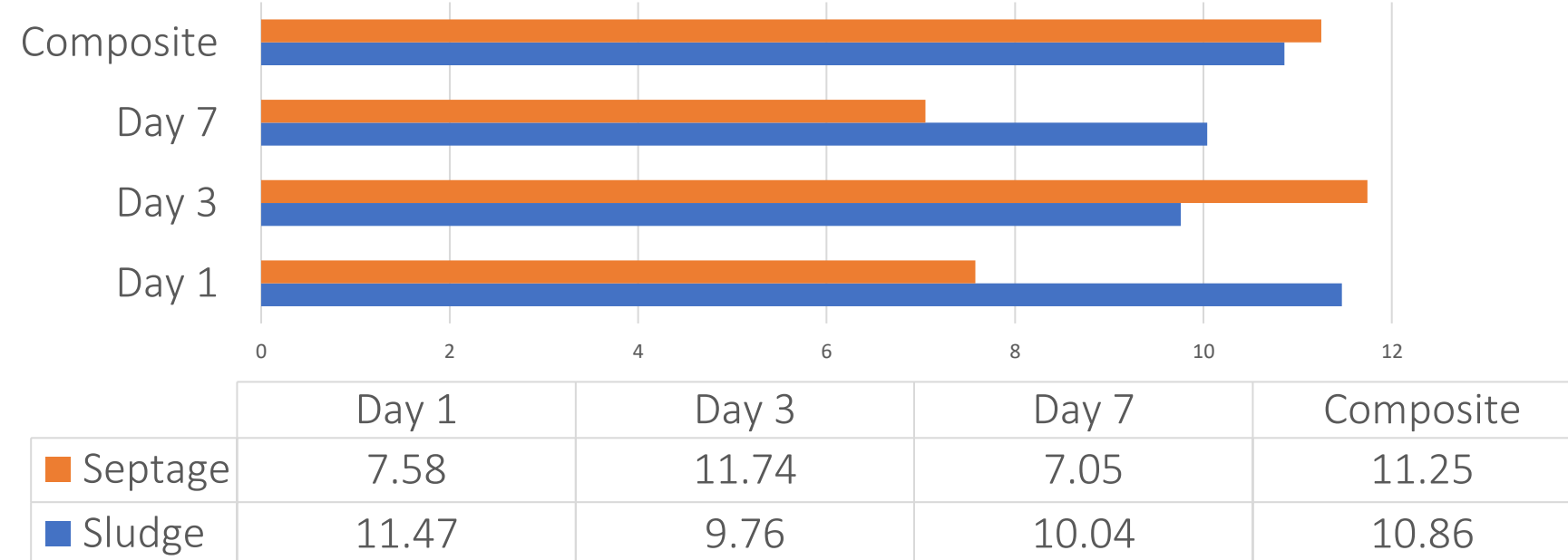
Project Muttathara – 200 KLD @ 5% Solid-Sewage Sludge Indicative Process Flow Diagram with Mass Balance



NOTE: The above is indicative and subject to change during detail engineering.

Process Flow and Material balance

STP Sludge & Septage: Calorific value



Sludge Analysis results

The required calorific value for the smooth operation is 14 to 15 MJ/kg and the available calorific value is between 11 to 15 MJ/kg. Adjustment can be done using biomass for cofiring with the septage or sludge in the Omniprocessor

FINANCIAL ASPECTS

Cost category	In Lakhs per annum
Cost of consumables (Flocculants, Oil/Grease and process chemicals)	30
Cost of IBR boiler operator	12
Cost of mandatory and recommended spares	15
Cost of emergency spares	15
Miscellaneous	10
Total cost	82

*Electricians, fitters and unskilled labours of the existing Muttathara STP can be used for the proposed FSTP. Thus, no separate human resource is required except the boiler operator.

Opportunities from By-products (365 days of operations)

Forward linkage of ash 3 TPD @Rs 1000 per ton	INR 10.8 Lakhs
Distilled water sold at Rs 250 per KLD. 19KLD generated	INR 17.3 Lakhs
Total expected revenue per annum	INR 28.1 Lakhs

*Additionally, Project Management Unit support from WASH Institute and monitoring support from IIT Palakkad will be offered for the project to ensure the overall sustainability

OVERALL, THE PROJECT IS TECHNOLOGICALLY, STATUTORILY AND FINANCIALLY FEASIBLE FOR TRIVANDRUM STP AND IS A MERIT TO THE STP