Supporting Document

Table 1SD Pseudo steady-state influent and effluent characteristics (10 samples)

Parameter	Influent (mg/L)	Effluent (mg/L)
	Average±SD	**Average**±SD
TCOD	571±171	188±88
SCOD	214±120	92±77
Methanol	141±112	
NO_2-N	48±16	9.2±16
Total N	95±17	27±18
Soluble N	72±16	23±18
Total P	6.9±3.2	1.8±0.9
Soluble P	1.3±0.5	0.4±0.38
NH_3-N	21.2±3	11.5±2.6
Alkalinity ($CaCO_3$/L)	228±41	487±86
TSS	340±80	96±24
VSS	250±76	62±14
Bioreactor parameters		
MLSS	4439±190	
MLVSS	3392±125	
SRT	17.4	

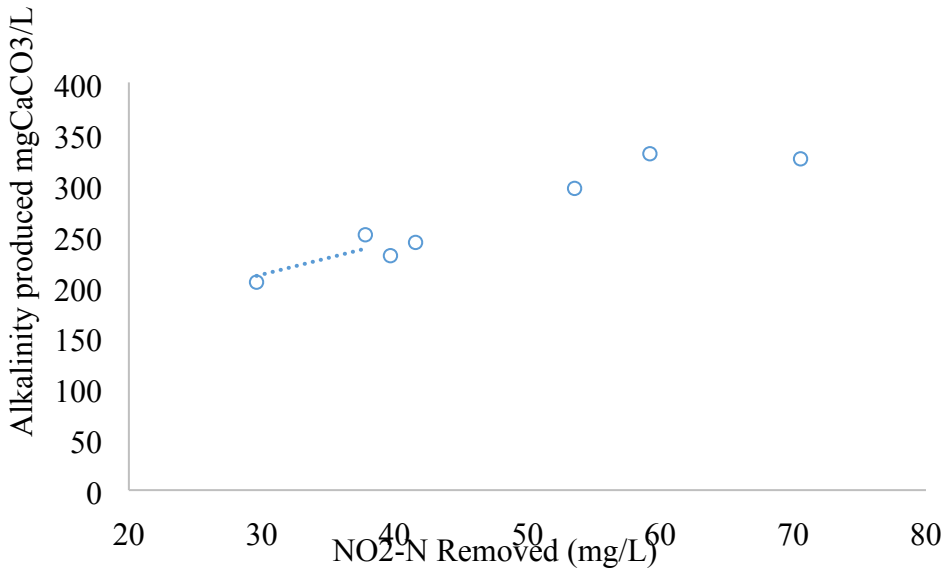


Figure 1SD. Relation between the alkalinity produced and nitrogen removed in the SBR (influent and effluent data, room temp. 25°C)

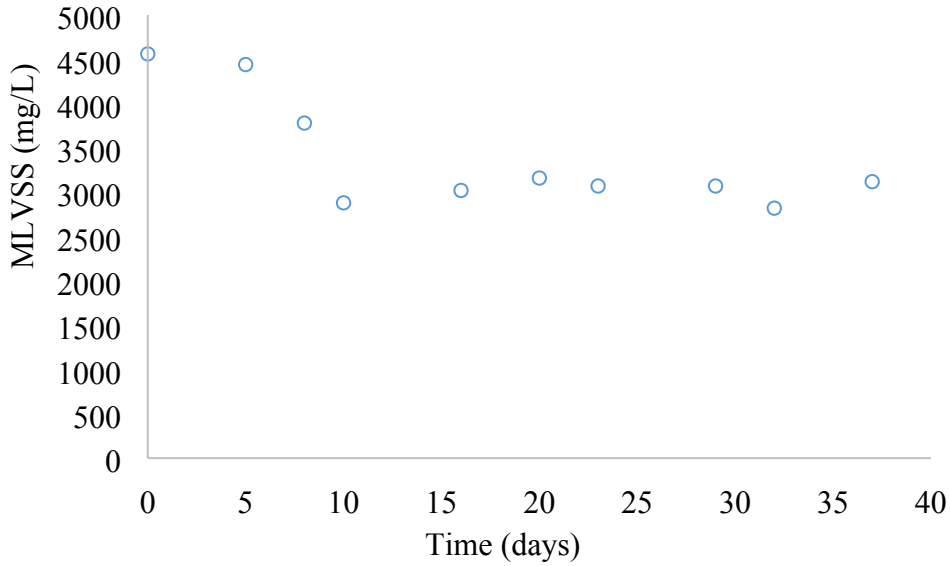


Figure 2SD. MLSS concentration in the SBR during pseudo-steady-state operation (room temp. 25°C)

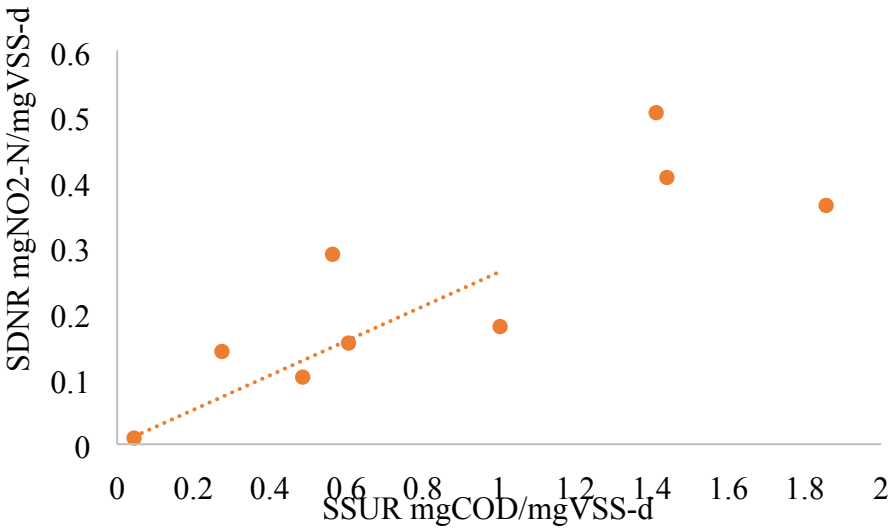
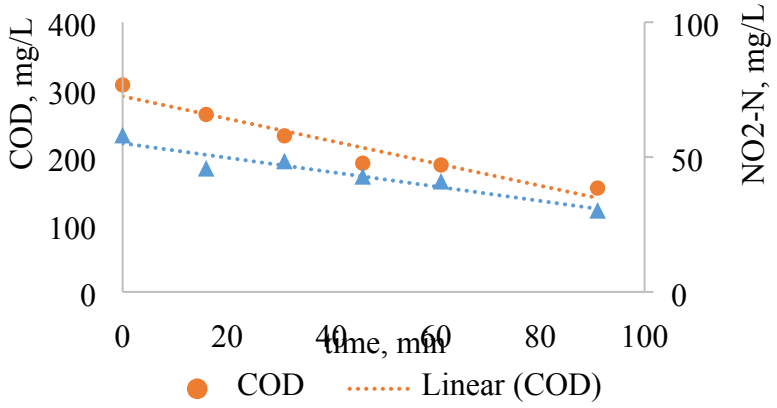
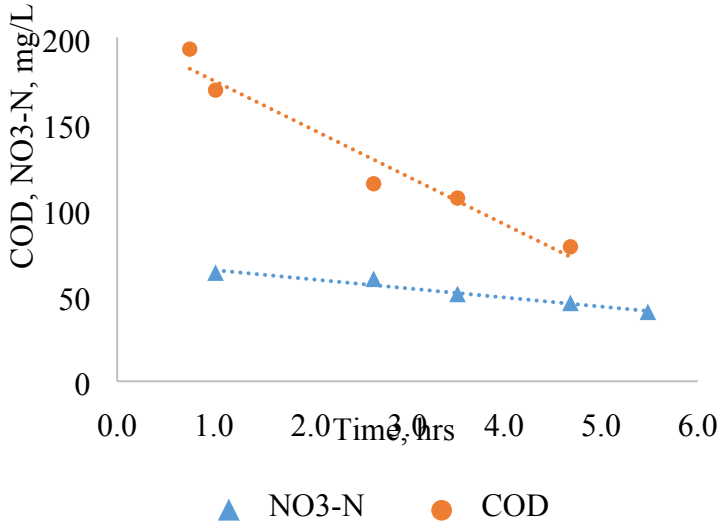


Figure 3SD Relation between SDNR and SSUR to estimate the yield coefficient-Post denitrification (kinetic study in the post-denitrification SBR, room temp. 25^{o}C)

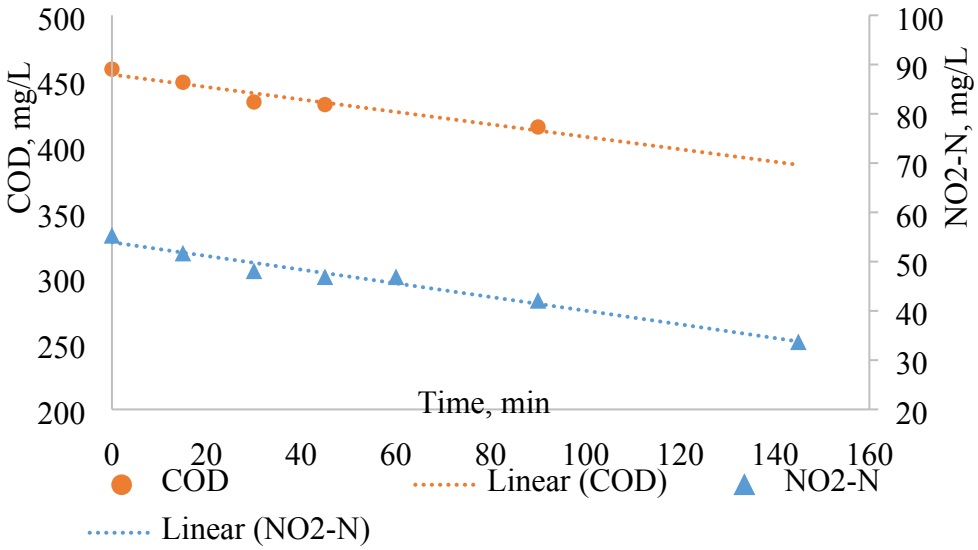


(a)



(b)

Figure 4SD Denitrification rates for (a) nitrite and (b) nitrate with MWW as a sole carbon source (batch kinetics, room temp. 25^{o}C)



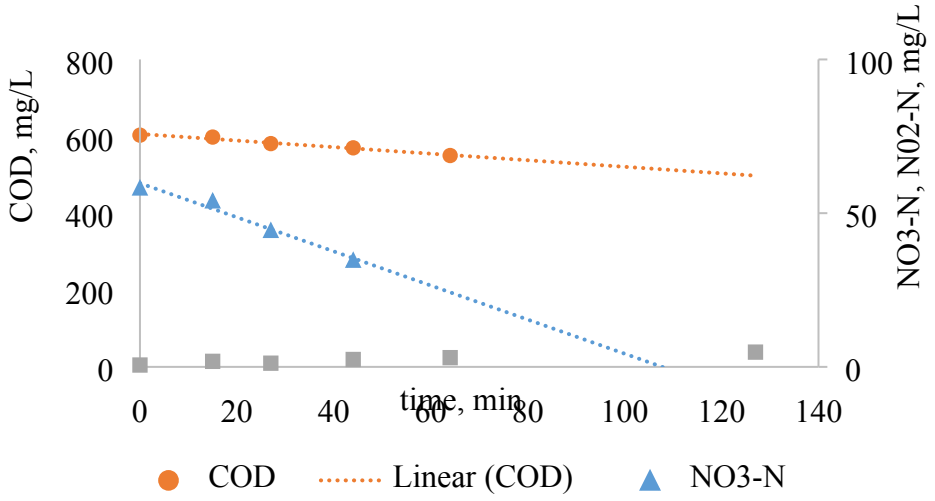


Figure 5SD Denitrification rates for (a) nitrite and (b) nitrate with methanol as a sole carbon source (batch kinetics, room temp. 25°C)

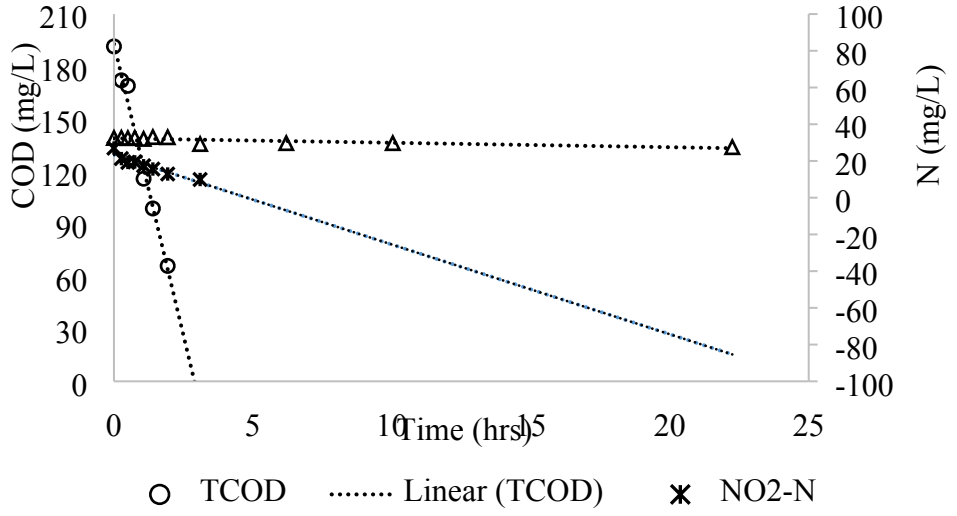


Figure 6SD Denitrification rates of a mixture of nitrite and nitrate with MWW(B2)

Table 2SD Pre and post denitrification cost calculation

Pre-denitrification:

Step-1 Assume

- The bioreactor volume (V1=1000 m^3)
- MLVSS=3000 mg/L

Step-2 Calculate the nitrite mass removed per day under pre-denitrification scenario

- Consider maximum nitrite SDNR of 0.52 mgN/mgVSS-d (based on this study, carbon source MWW+methanol)
- NO_2-N = 0.52 mgNO_2-N/mgVSS-d x 3000 mgVSS/L x 1000 m^3 = 1560 gNO_2-N/d

Step -3 Estimate the equivalent post denitrification tank volume

- Consider maximum nitrite SDNR of 0.38 mgNO_2-N/mgVSS-d (based on this study, Carbon source – methanol only)
- V2 = 1560 gNO_2-N/(0.38 mgNO_2-N/mgVSS-d X 3 gVSS)= 1368.42 m^3

Step -4 Calculate percent saving

% Savings (equipment, power and volume) = 100 x (1368.42 -1000)/1000 = 36.8%