LIFE B2E4SustWWTP (LIFE16 ENV/GR/000298)

New concept for energy self-sustainable wastewater treatment process and biosolids management

Deliverable: A.1.2 Technical report for microscreen tests

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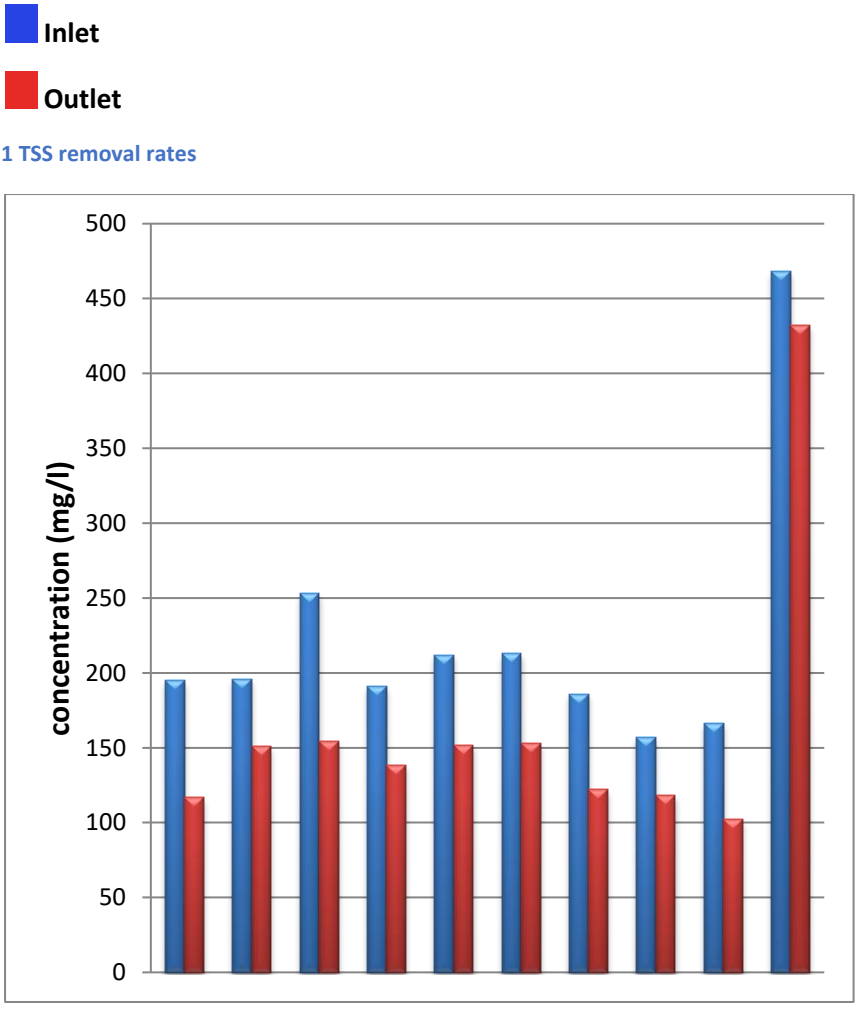
Microscreen preliminary tests

1. Removal rates

Preliminary tests on the microscreening treatment method were conducted by TUC in WWTP, Rethimno (DEYAR), so as to determine the removals of TSS, BOD_5 and COD achieved. In addition, TS content (%) was measured in the produced sludge, along with its VS content (% of the TS). A 350μm pore size openings belt was used for the tests and the maximum hydraulic load of the microscreen was 1 MGD (3785 m^3/day). Experimental and laboratory analysis period was 30 days. The preliminary tests showed quite encouraging results in removals of TSS (29,2±9%), BOD_5 (14±6%), COD (16,5±6%), followed by their standard deviation, respectively. The outgoing primary sludge after microscreening found to have a dry solids content and organic volatile solids (percentage on total SS) 26-44% and 82-85% respectively. Results are presented in diagrams 1,2,3 and 4,5.

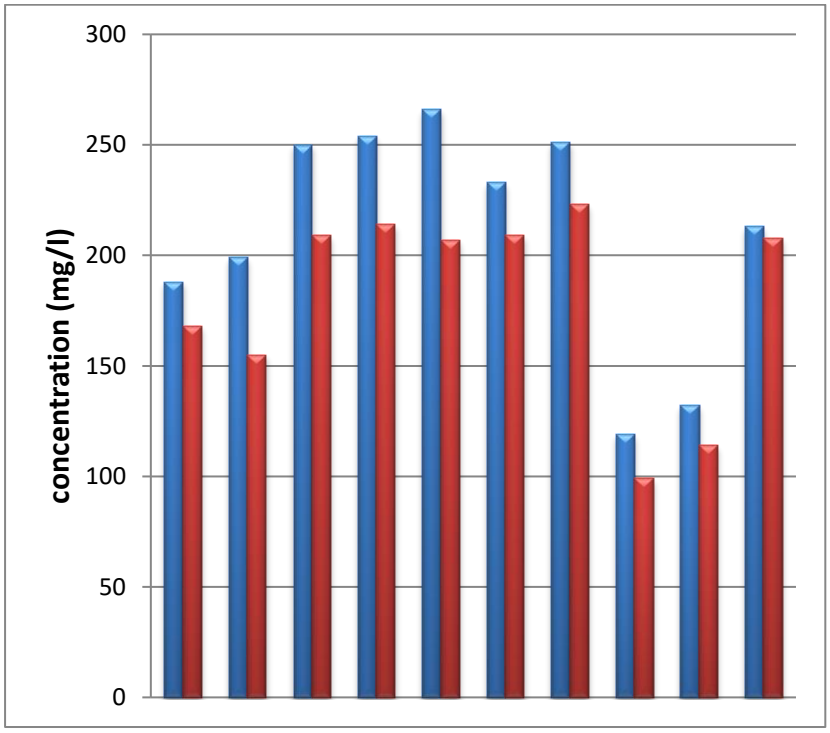


1 TSS removal rates

Inlet

Outlet

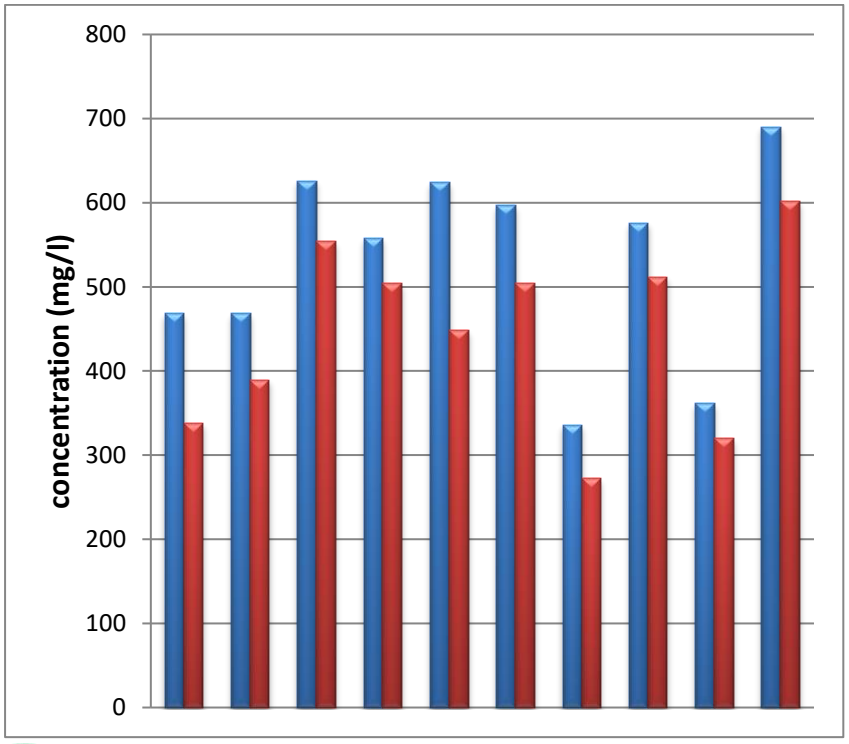
2 BOD removal rates



Inlet

Outlet

3 COD removal rates

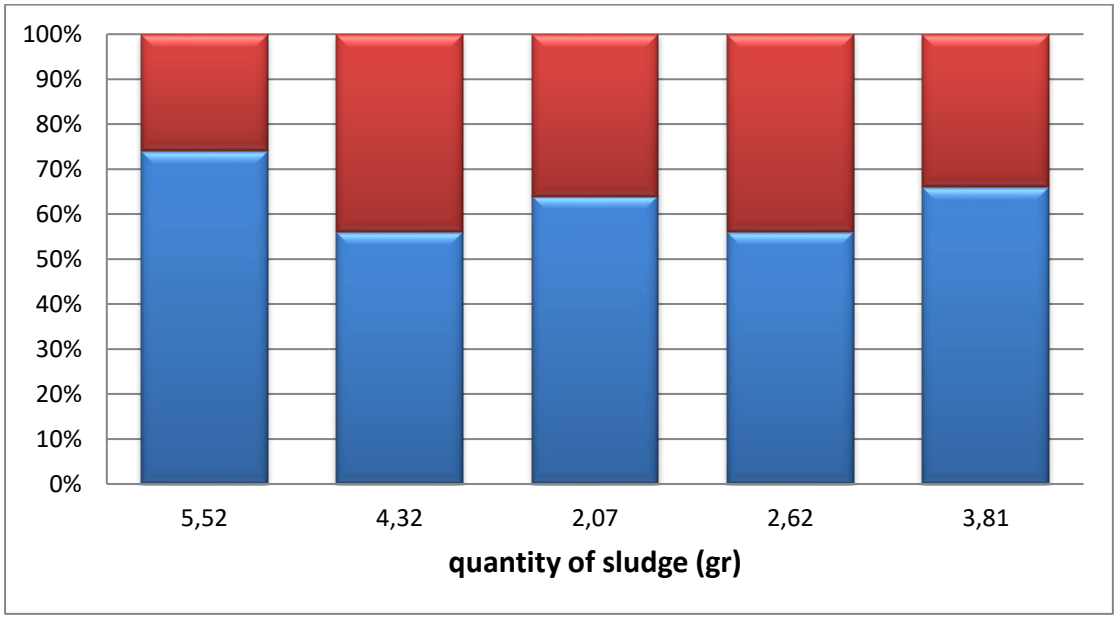


2. Sludge characteristics

Humidity

Solids

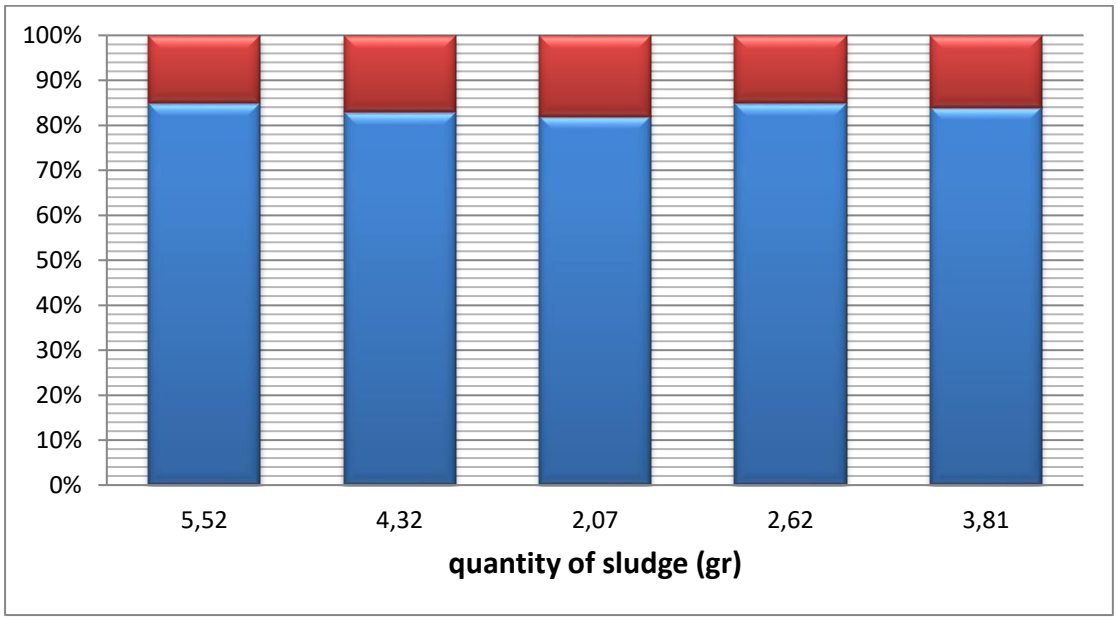
4 TS-Humidity (%)



Volatile solids percent

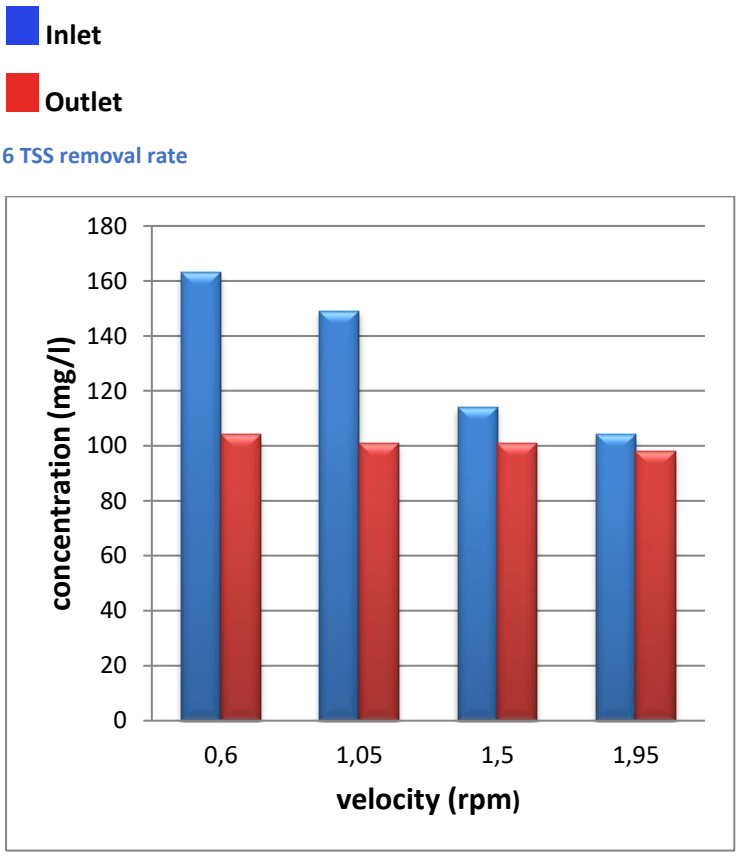
Ash

5 VS-TS (%)



3. Belt speed impact on removal rates

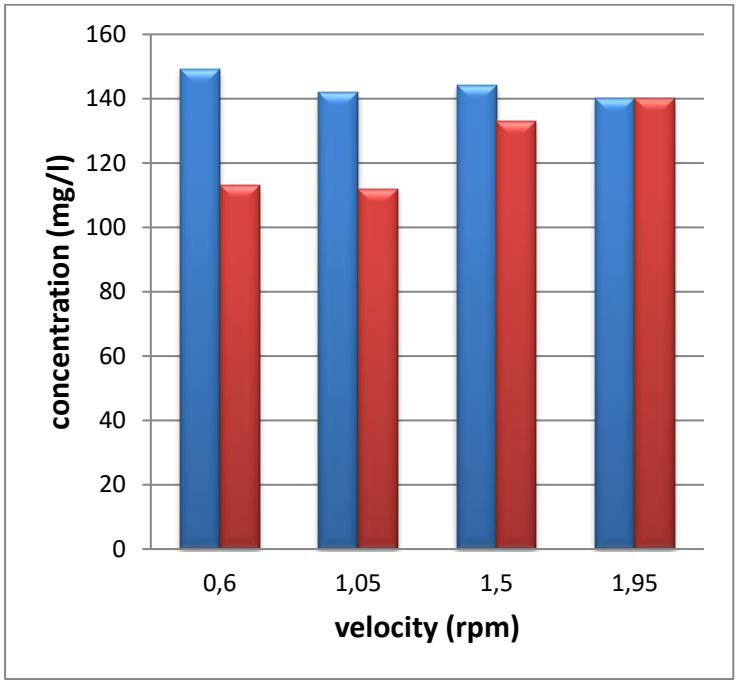
Rotating belt speed of the microscreen found to have a major impact on the removals achieved. To determine and quantify that correlation, additional tests were conducted with four different belt speeds (0,6-1,05-1,5-1,95 rpm). Results showed decreased removals in higher speeds at steady incoming flow rate. Removals achieved are presented in diagrams 6,7,8. Microscreening tests would be also conducted in between the next months with different belt size pore openings so as to compare the removals achieved. Due to the nature of the technological equipment demanded, TUC was unable to carry out those tests for the time being. Flocculants-coagulants could be also used.



Inlet

Outlet

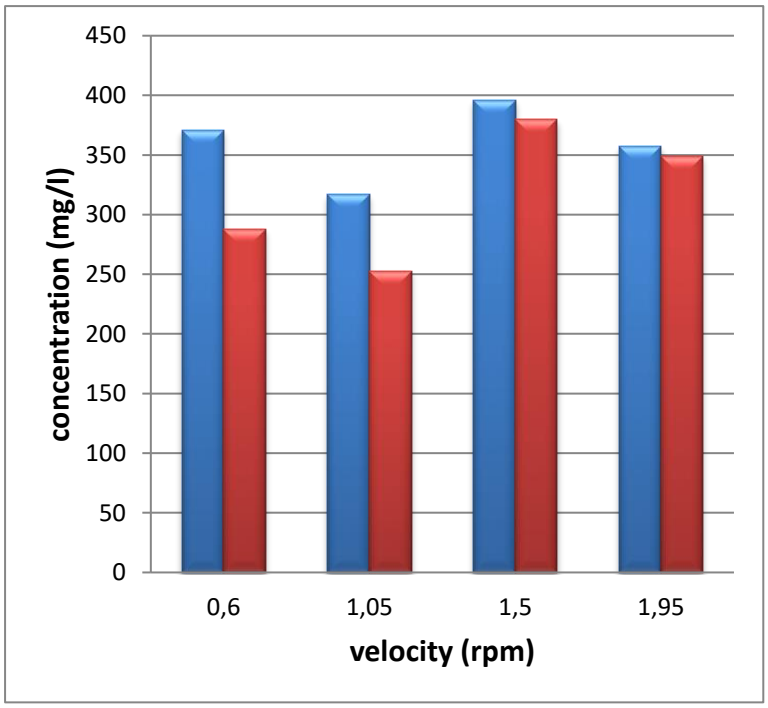
7 BOD removal rate



Inlet

Outlet

8 COD removal rate



4. Sludge quantification

In addition, TUC and DEYAR conducted preliminary tests to quantify the outgoing primary sludge produced by the microscreen. Sludge weight was measured both in wet and dry phase. Results are presented on table 9.

9 Sludge production

Total Incoming flow (m^3)	Sludge produced (wet phase, kg)	Produced sludge/m^3	Sludge TS (%)	Sludge (dry phase, kg)	Produced sludge/m^3 (dry phase)
135	9,2	0,068	32-41	3,358	0,0248
135	10,3	0,076	32-33	3,347	0,0247
70	12,8	0,182	35-37	4,608	0,0658
60	6,3	0,105	35-37	2,268	0,0378
125	17,8	0,142	34-36	6,230	0,0498
average	**11,28**	**0,114**	-	**3,962**	**0,0406**