

Exercises V: Treatment of wastewater solids I

Applied wastewater engineering

Exercise 1: Handling of screenings

A wastewater treatment plant with 22'000 population equivalents is equipped with a coarse screen (size of openings: 10 mm) which is followed by a fine screen (size of openings: 6 mm). Both screens have rectangular slots. The screenings collected have an average TS content of 12 % before treatment. The volume of the screenings is reduced to an average TS content of 35 % by a screening's compactor (density can be assumed equal to 1).

Table 1 : screenings production per capita at 8 % TS in function of type of screen and size of opening.

size of opening (mm)	screenings per capita at 8 % TS (L/PE-year)	
	rectangular slots	circular slots
0.5	49	135
1	41	117
3	26	50
6	14	21
8	9.0	16
10	6.5	14
20	4.5	-

1. Draw a scheme containing all information required for this exercise.
2. What volume (in m³) of untreated screenings does each screen in average produce per day?
3. How many waste containers of 1.1 m³ must be evacuated per week?
4. Is one screenings waste container of 1.1 m³ enough over the weekend (weekend lasts from Friday evening 5 pm until Monday morning 9 am) for the second screen if it is already three quarters full on Friday evening? What do you suggest?
5. The community considers buying a new screenings washer and compactors (volume reduction of screenings ≥ 80 % compared to raw screenings). They want to know by how much (in percent) the screenings volume would reduce compared to the current compacted screenings. Would they have other benefits from such a modification?

Exercise 2: Grit and grease removal

1. Why should you install a grit removal in a wastewater treatment train?
2. What are the advantages of an aerated grit and grease removal compared to a non-aerated?
3. What are the advantages of using a grit washing and drying unit?