



## An Analysis of FOG/Scum in eThekweni Municipality Pump Stations

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### What is FOG/scum?

The most commonly reported problems in sewers and pump stations are blockages caused by the presence of fats, oil and grease (FOG) (US EPA, 2004), followed by increased demand for line flushing with the most severe problems being experienced in the city centres (Mattson, 2014). FOG in wastewater forms a thick murky layer known as scum. The Figures 1, 2, 3 and 4 depict scum sampling in Durban.



Fig.1-FOG/Scum in settler



Fig.2 -FOG/Scum in clarifier



Fig.3-FOG/scum in tank

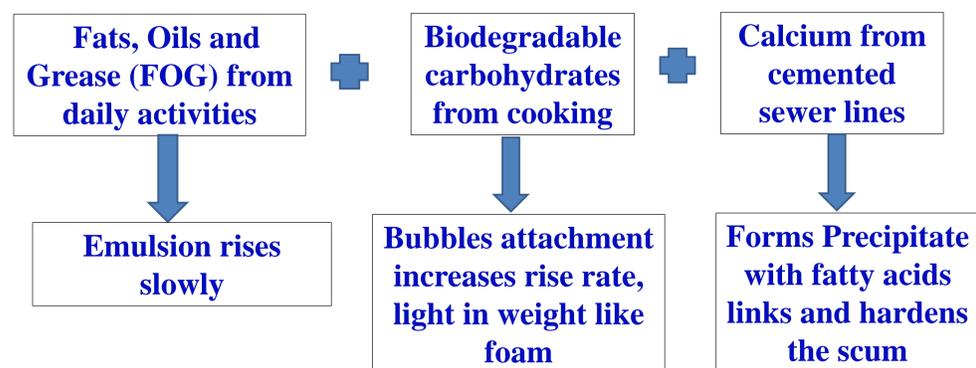


Fig.4-FOG/scum samples

### What problems are due to FOG/Scum?

Problems	Causes
Scum accumulation in tank	Debris not caught in the screens. Blocked scum hopper outlet pipe.
Floating fat, oil and grease	Excess fats, oil and grease discharged.
FOG discharge with overflows	Scum baffle is too shallow.
Brown scum on reactor surface	Scum forming filaments.
White scum on reactor surface	Sludge age is too short.

### What is hypothesis of the study?



### What methods were for the analysis of FOG/Scum samples?

- Step 1- Locating the problematic pump stations in the sub-catchment .
- Step 2 - Determining socio- economic background of sub-catchments.
- Step 3 - The samples were collected from influent tank of the pump stations between 27<sup>th</sup> Sep. to 7<sup>th</sup> Oct.2015.
- Step 4 - Performing laboratory analysis of the samples.
- Step 5 - We analysed moisture ,total solids ,volatile solids, ash and C: N: S.

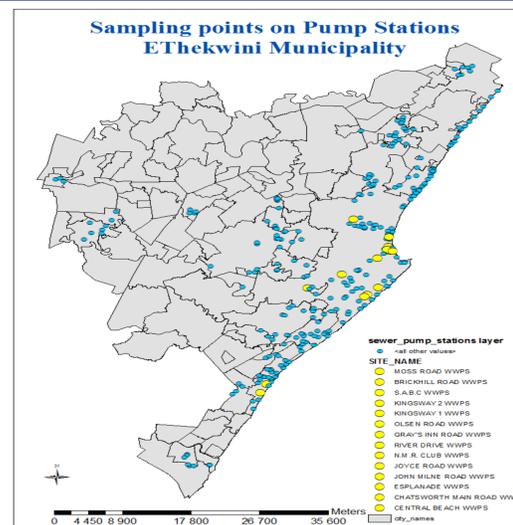


Fig.5 - Location of sampling points and other pump stations in Durban

\*There are total 282 pump stations in eThekweni municipality of which 50 are decommissioned and 232 are operational in 2015.

### What results were obtained from laboratory analysis?

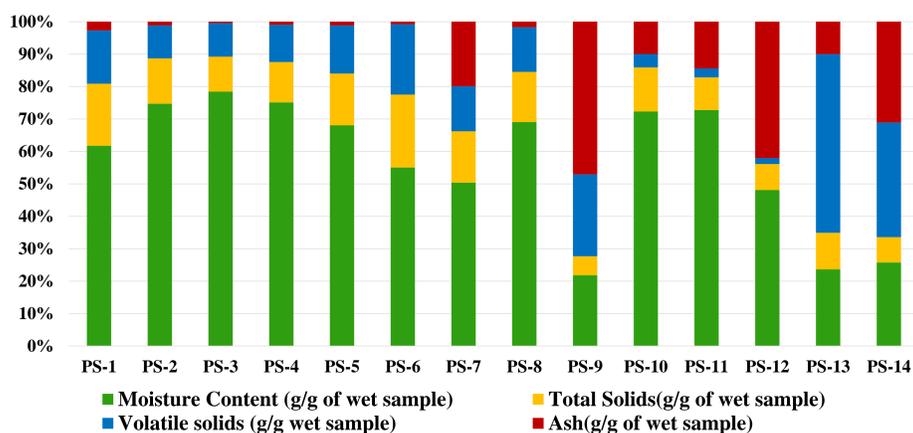


Fig.6 – Moisture content, total solids, volatile solids and ash in FOG/Scum samples from 14 Pump stations

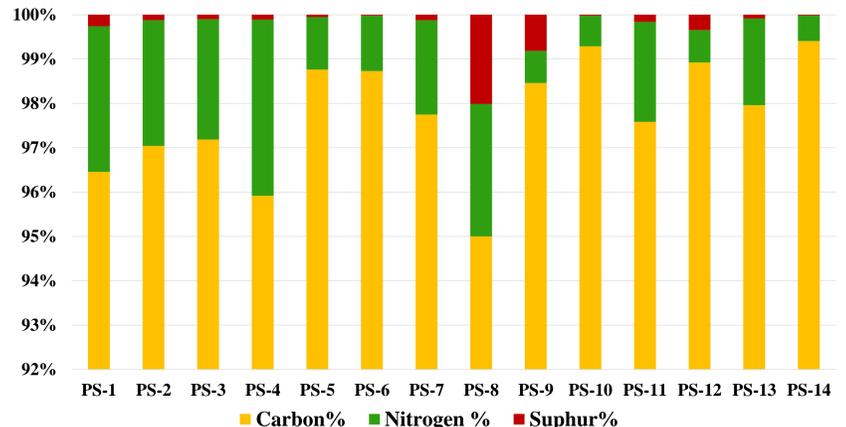


Fig.7-C:N:S ratio of FOG/Scum in the 14 Pump stations

### What we concluded from the results obtained?

1. Only 14 pump stations have significant amount of scum formation in sub-catchments of the eThekweni municipality.
2. The visual difference in the presence of the scum sample indicate the difference in formation.
3. The scum has a very high moisture content.
4. The FOG/scum samples contain mostly carbon, with small amounts of nitrogen and sulphur.

### What would be our future work?

1. Experiments and investigations on scum needed to define the causes of scum formation.
2. We will measure calorific value of the scum , analyse COD and metals in the FOG/scum samples from other wastewater installations.

### Acknowledgment

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