

“Sanitation Innovations for
Humanitarian Disasters in Urban Areas”

SPEEDY SANITITAZION AND STABILIZATION

APPENDIX 2

LIME DOSAGE DETERMINATION PROCEDURE

LIME DOSAGE DETERMINATION PROCEDURE

MATERIALS

- 300g Sludge sample
- Electronic balance
- 4 x 500ml Beakers
- 1L graduated cylinder
- Glass Stirring rod
- Spatula
- Weigh tray
- pH meter

SAMPLING

Using the 1L plastic sampling bottle a sample of faecal sludge to be used in the experiment was taken from the plastic drums where subsequent to the sludge being added.

PROCEDURE

1. 300ml of faecal sludge was added in the beaker.
2. Using a pH meter the initial pH of the sludge was measured and recorded
3. 0.5 grams of Lime was weight and added to faecal sludge
4. Using a glass stirring rod, the lime was mixed with the faecal sludge until it had become a homogeneous mixture.
5. The pH of the mixture was taken using the pH meter and recorded in the notebook
6. Steps 3-5 were repeated until the pH of the mixture reached above pH 12.0
7. This procedure was repeated for multiple sludge samples
8. Using Excel, the cumulative soda addition was calculated and a curve illustrated soda dosage per L sludge vs. resultant pH was generated as given in Table 1 and Figure 1.

Table 1: Cumulative Lime Addition

LIME ADDED (gr)	MEASURED pH SAMPLE 1	CUMMULATIVE LIME ADDED (gr)	gr Lime/L sludge
0	7,82	0	0,00
0,5	8,60	0,50	1,67
0,5	8,98	1,00	3,33
0,5	9,30	1,50	5,00
0,5	9,56	2,00	6,67

0,5	9,87	2,50	8,33
0,5	10,32	3,00	10,00
0,5	11,64	3,50	11,67
0,5	12,14	4,00	13,33
0,5	12,28	4,50	15,00
0,5	12,32	5,00	16,67
0,5	12,35	5,50	18,33

For the sludge samples tested for the experiment conducted on the 2nd February 2016, the following lime dosage curve was developed as illustrated in *Figure 1*.

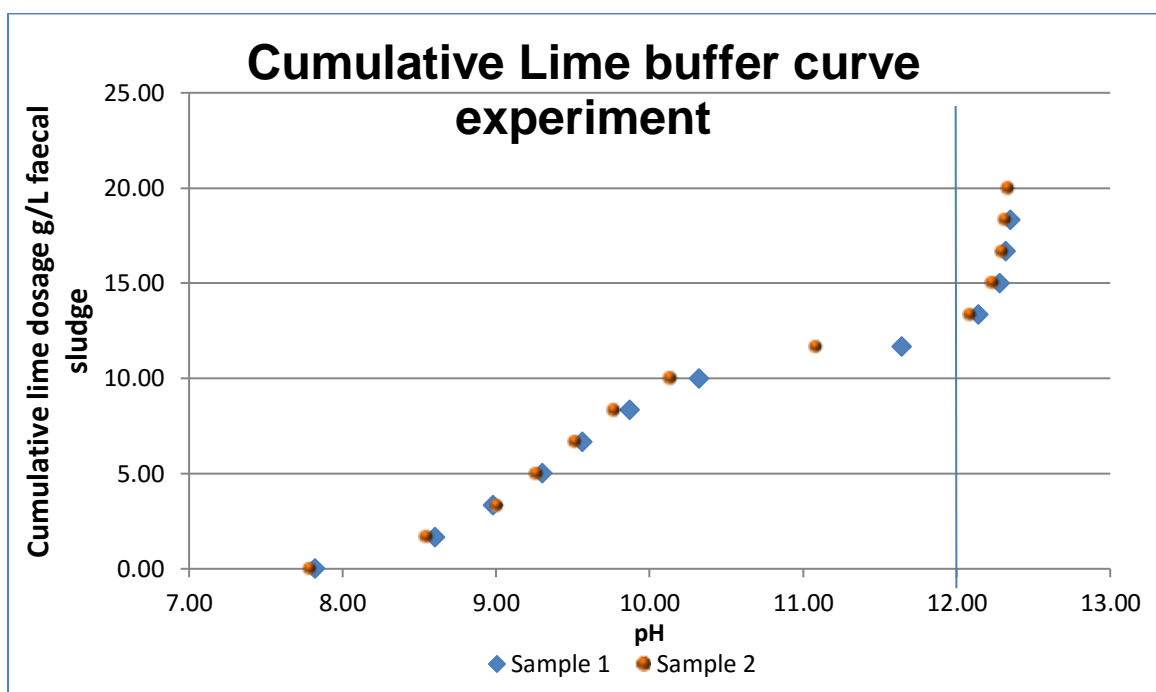


Figure 1: Cumulative Lime Buffer Curve for sample of sludge (9/02/2016)

Based on this experiment, the dosage of lime (calcium hydroxide) was estimated to reach different pH as it is shown in the *Table 2*.

Table 2: Estimated Lime dosage at different pH

Desired pH	Estimated dosage (gLime/Lsludge)
pH 9	3,54
pH 10	9,20
pH 11	11,05
pH 12	13,95