

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The purpose of this research investigation was to conduct three different leachate recirculation schemes and compare the impacts of each recirculation schemes on the landfill stabilization of organic waste. According to these stated objectives, major experimental results can be summarized as follow:

Plan A and plan B leachate recycle scheme showed comparable efficiency of organic waste stabilization, as reflected by COD reduction. However, plan B reactor showed more efficiency on biogas production as reflected by cumulative gas production, and methane gas production. This showed that plan B scheme was more robust to the situation of simulated landfill by adjusting leachate recycle volume accordingly.

With significantly high rate of methane gas production from plan B leachate recycle scheme, this scheme is recommended for small-scale landfill and landfill with biogas production purpose. This leachate recirculation scheme required examining these parameters frequently; daily gas production, methane gas percentage, and COD. As a result, the application of plan B scheme to large-scale landfill might not be justified. Moreover, with comparable COD reduction in plan A and plan B reactors, plan A leachate recycle scheme is recommended for the landfill with leachate COD reduction purpose, and large-scale landfills, where daily analysis of leachate COD and methane were lacking.

5.2 Recommendations

1. Mathematical modeling should be carried out so that the systems performance can be predicted via association between inputs and outputs.
2. Investigate the possibility of using plan B for leachate recirculation scheme in actual scale landfill since this research was done in lab-scale.