

## CHAPTER FIVE

### CONCLUSION

#### 5.1 Conclusion

- Types of cover system showed great influence on the quantity of leachate generated and on other WBCs. Excellent stands of grass vegetation helps to promote evapotranspiration. It also minimised erosion impacts when having surface slope at 5%.
- Type T-4 and T-5 cover systems were the most efficient based on leachate generated.
- Type T-4 offers an economical advantage over type T-5.
- Cover systems of type T-1 and T-2, without lateral drainage layer within the system caused 50% of the precipitation to infiltrate into the wastes and became leachate.
- When geomembrane layer was installed for cover system type T-2, an increase in value of runoff occurred.
- When geomembrane was used in cover system type T-2, erosion was high due to increase runoff because there was no lateral drainage provided to drain out water laterally.
- By providing excellent stand of grass vegetation on landfill final-cover the quantity of leachate generated was minimum when water evapotranspired through vegetation.
- Topsoil of type silty loam helped to enhance evaporation through suitable condition for growth of vegetation.
- The surface slope of 5% gave very low soil erosion impacts, when runoff was minimum.

- Drainage materials such as coarse sand, gravel and geonet are efficient in serving their functions as lateral drainage materials, where maximum quantity of water was collected and therefore leachate generated was minimum.
- Barrier soil materials that served efficiently to reduce infiltration into the landfill to prevent leachate generation are clay, silty clay, and clay loam.
- It was concluded that the model type T-4 with combinations of the best selected parameters of topsoil materials, lateral drainage, barrier soil with excellent stand of grass vegetation, surface slope of 5% and topsoil thickness 400 mm is found to be the most efficient and economical at cost of RM 26/m<sup>2</sup>.

## 5.2 Recommendation

- A study on the vertical cutoff wall made of slurry bentonite to prevent lateral movement of contaminants in the post-closure landfills should be conducted. Vertical cutoff wall should be provided to the existing post-closure landfills as to avoid lateral movement of the leachate from contaminating the surrounding environment.
- A study of bottom liners' effectiveness of waste containment systems should be conducted.
- A study on soil contamination should be carried out before reclamation of the landfills area is made.
- A study should be carried out on the types of pollutant and transport mechanism that occurred across the soil and also geosynthetic liners, when leachate accumulates.