



### Site Description

A Pilot Study was conducted on a 1.6HA (4 acre) section of a landfill with active anaerobic sections adjacent to the aerobic test plot.

### Technology Application

The aerobic system consisted of an air injection system, with no landfill gas extraction system. The effects of anaerobic degradation of the waste were measured at the vent wells prior to air injection. After the baseline was measured, the air injection system was started to start aerobic degradation of the waste.

### Results – Aerobic Degradation

Figure 1 shows the analysis of the landfill gas and the temperature at the site. As aerobic degradation started (February 1997), both methane and carbon dioxide production decreased at the site, carbon dioxide then started to increase and was correlated to the decrease in oxygen content, indicating that aerobic degradation was occurring at the site. During aerobic degradation, methane concentrations were maintained well below 5% of the extracted gas (as opposed to 50% of the gas under baseline anaerobic degradation conditions).

Average results from the study demonstrated that:

- the biodegradation rate increased by 50%;
- methane concentrations decreased by 50-90%;
- leachate volumes decreased by 86%;
- leachate BOD (an amalgam measure of organics in the leachate) decreased by 70%; and
- The site had settled by 10%.

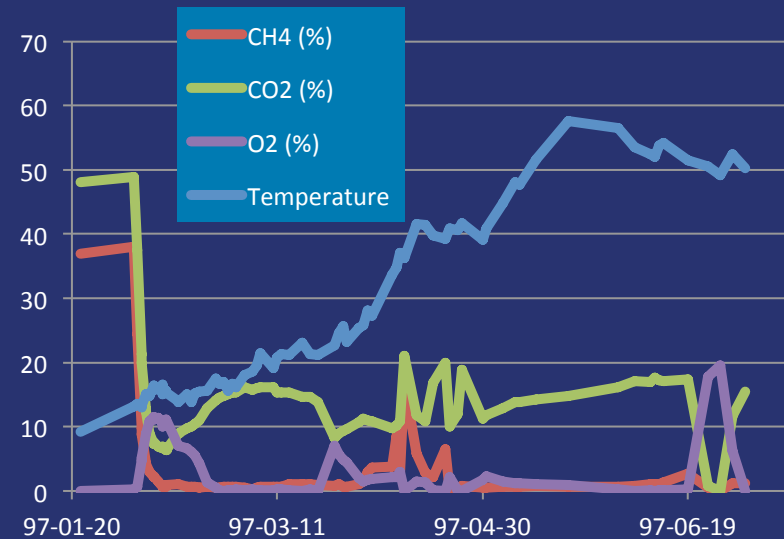


Figure 1 Gas analysis results

### Results – Landfill Mining

After the 18 month study, the landfill site was opened and the material was mined:

- the aerobic site was full of brown, humic material as a result of organic waste degradation;
  - the anaerobic site had raw waste, mostly in a non-degraded form;
- the aerobic site had no odours during the mining process; and
  - the anaerobic site had odours associated with hydrogen sulphide and ammonia.

Results from the study were published in:

Read, A., Hudgins, M., & Phillips, P. (2001). Aerobic Landfill Test Cells and Their Implications for Sustainable Waste Disposal. *The Geographical Journal*, 167(3), 235-247.