

APPENDIX 1 LEACHATE WATER BALANCE ASSESSMENT

1.0 INTRODUCTION

This appendix presents a detailed water balance for the Zwejra landfill, developed in three cells, which estimates the potential volumes of leachate that could be generated within the proposed Phases 1, 2 and 3 at the proposed Landfill

2.0 THE DETAILED WATER BALANCE

2.1 The Methodology

Leachate generation calculations have been prepared using a standard water balance methodology to estimate the quantities of leachate that would be produced by the Zwejra Landfill site during the development of the proposed cells and following the restoration of the site.

For the purposes of this estimation, the lifecycle (cell active, uncapped, restored etc.) of each phase has been estimated and modelled accordingly. These estimations are based on landfill development proposals.

In the water balance calculations the worst case scenario taken is 200% of average rainfall which is consider a very conservative.

2.2 Water Balance Results

The water balance estimations which predict the extreme worst case indicate the following:

- During the year 2004 for the operational stage of the landfill on the whole base area leachate is produced in insignificant quantities due to the absorptive capacity of the waste being greater than the water inputs from precipitation.
- Maximum leachate generation peaks in c.2005 (approximately 5,000m³).
- Following the complete restoration of the Zwejra Landfill there is sufficient adsorption capacity that free leachate production is delayed until at least 2,014. Once the adsorptive capacity of the waste has been utilised the long term average rate of leachate production is estimated being gradually increased till year 2019 with maximum input rate of 760 m³/year 1000m³/year (2.08m³/day).
- Since the cells of Zwejra landfill are hydraulically independent the real amount of leachate per cell will be one third of above.
- Once the vegetative cover on the 1m thick restoration soil has been developed there will be steady decrease rate of leachate generation. Leachate will cease being generated 2040 when all water infiltration will be consumed by soil moisture deficit, vegetation support and swelling properties of underlying mineral liners.