

## EXECUTIVE SUMMARY

The objectives of the study were to establish a reference document describing locally and internationally available sludge management technologies, their respective applicability under South African conditions, and first-order cost estimates of their possible implementation. The aim was to give a clear indication to metropolitan councils, municipalities and other sludge producers of the technologies available and applicable under local conditions, as well as an indication of the cost and economy of scale applicable to each process.

The study includes an overview of current sludge management practices in South Africa, as well as an estimate of sludge quantities and qualities and a brief description of commonly used sludge treatment and disposal methods.

A summary of the status quo of legislation in South Africa with regard to sludge management is also given. This is followed by a description of the possible utilisation and disposal routes available within this legal framework, using as a basis the *Sludge Utilisation or Disposal Decision Flow Diagram (SUDDFD)*, as presented in the Addendum No 1 to the *Permissible Utilisation and Disposal of Sewage Sludge (Edition 1)*, (Department of Agriculture *et al* 1997). The sludge treatment requirements and available technologies for each of the utilisation or disposal routes are listed in matrix form for easy reference and use.

Concise descriptions of the sludge treatment technologies mentioned in the matrix and other currently available techniques are given together with a first-order cost estimate for selected technologies.

First-order cost estimates are presented for the established processes that are considered appropriate for South African circumstances. The cost estimates include estimates of capital costs, annual costs of the capital expenditure, operating costs, and maintenance costs. These cost estimates serve as a guide in selecting appropriate sludge treatment technologies. Typical case studies are presented to illustrate the use of the Sludge Management Decision Matrix and the cost sheets.

The report concludes with the following recommendations for further research:

- i. National survey of wastewater treatment plants, their treatment processes, sludge quantities and qualities as well as current sludge utilisation/disposal routes and related costs,
- ii. Development of benchmark criteria for comparing the performance of different wastewater treatment plants and their sludge management.
- iii. Monitoring of existing sludge reuse facilities and practices in order to establish the real effects and costs of the specific process involved.
- iv. Future updating of this study on a regular basis in view of the dynamic nature of the aspect of sludge handling in the field of wastewater treatment.