

'SEPTAGE DISPOSAL INTO SEWERAGE SYSTEMS

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BY
A A L MARK



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DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY OF MORATUWA
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This thesis was prepared and submitted in partial fulfilment of the Master's Degree in (MEng) Environmental Engineering and Management to the Civil Engineering Department of the Faculty of Engineering, University of Moratuwa, Sri Lanka.

November 1996

DECLARATION

This thesis has not been previously presented in whole or part to any university or institute for a higher degree.



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November, 1996

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ABSTRACT

The methods for the disposal of septage vary from place to place. If the chosen method is not appropriate and planned then it has potential to cause severe damage to both the receiving body and the surrounding environment. A typical example is Colombo City and its sewer system. Here, unsewered areas of the City and its suburbs produce high quantities of septage which is often disposed of by vacuum trucks which empty their contents into nearby manholes of the sewer network.

In many developed countries septage is treated at very high cost. The main objective of this study is to develop an appropriate method for disposal of septage in a city like Colombo where a sewerage network is already available for part of the city.

A field survey was carried out to find out the necessity and the frequency of emptying septic tanks as well as any other on-site sewage systems available in unsewered area. Further, the type of on-site sewage system available and its suitability to the location were also investigated. For this purpose eight locations where emptying took place very frequently were selected. In addition to this, the type of vacuum trucks in service, behaviour pattern of the workers involved, the level of service the rate payers receive from the authorities etc., were also studied.

These studies revealed that the quantity of septage which need to be emptied could be reduced by a considerable amount by adopting suitable on-site sewage disposal techniques with good construction practices. This, in turn, will reduce by a significant amount unnecessary expenditure incurred by the authorities. The level of service provided presently by the Municipality was found to be inadequate. A higher level of service can be achieved by motivating the workers, increasing the number of vacuum trucks and making improvements to the current management practices.

In addition to the above a pilot plant to receive the septage from the vacuum trucks was constructed at a terminal pumping station. The elements making up the pilot plant consisted of a screen, a sedimentation tank and a baffle wall. The disposed septage went through these basic elements and reached the main sewage stream at the pumping station. This preliminary treatment prevented problematic constituents getting into the sewerage system and causing heavy siltation and frequent blockages in the sewer network.

Another pilot plant was also constructed at the terminal pumping station to treat the odour which is produced from the septage disposal tank and the sewage pumping station. This 'Bio-Filter' type system used coconut fibre as a filter (growth) media. Laboratory analyses showed that this system was 60% efficient in removing H_2S at a 800 mm filter height (thickness) and at a retention time of 60 seconds.

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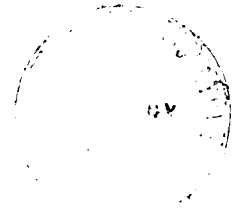
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LIST OF ACRONYMS

CMC	Colombo Municipal Council
CAB	Common Amenities Board
CEA	Central Environment Authority
EPA	Environmental Protection Agency
FRP	Fibre Glazed Reinforced Plastic
M/O	Micro Organism
NHDA	National Housing Development Authority
P.S	Pumping Station
SLLR&DC	Sri Lanka Land Reclamation and Development Corporation
S/T	Septic Tank
UDA	Urban Development Authority
WWTP	Waste Water Treatment Plant



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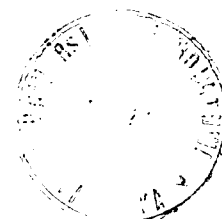


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