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for information

Strategic Sewage Disposal Scheme Stage I
Pilot Plant Study on Chemical Dosing and Disinfection
Situation Report

Background

In May 1995, a review of the Strategic Sewage Disposal Scheme (SSDS) was completed under a consultancy study - SSDS Stage II Options Review, with assistance and technical advice to the Government from an International Review Panel (IRP) comprising three internationally acclaimed experts in wastewater treatment and disposal¹. The IRP recommended that chemically enhanced primary treatment (CEPT) should be used permanently at Stonecutters Island Sewage Treatment Works (STW) which is currently being constructed under SSDS Stage I. They also recommended that pilot plant trials be undertaken to assess chemicals and dosage rates and that disinfection be investigated for flows in all stages of SSDS.

2. The Government has already responded to the recommendations of the IRP by changing the design of the Stonecutters Island STW to allow the CEPT process to be used permanently. In September 1995, the Government commissioned a one-year consultancy, to conduct a Pilot Plant Study on Chemical Dosing and Disinfection, in accordance with the IRP's recommendations. In this study, the same IRP as in SSDS Stage II Options Review have been appointed to provide independent advice to the Government.

Studies on Chemical Dosing

3. Chemical studies started with the determination of sources of chemicals which was completed in December 1995, from which Ferric Chloride, Ferric Sulphate, Ferrous Chloride, Ferrous Sulphate, Aluminium Sulphate (Alum), Poly Aluminium Chloride (PAC) and polymers were short-listed for further study. This was followed by laboratory scale tests (jar tests and column tests), completed in April 1996. These gave initial results to compare chemical performance and optimum dosage rates. All the above chemicals except Ferrous compounds and PAC (which had not performed well) were recommended for pilot plant trials.

¹ The International Review Panel members are : Professor Donald Harleman of the Massachusetts Institute of Technology, USA; Professor Poul Harremoes of the Technical University of Denmark; and Professor Qian Yi of Tsing Hua University, Beijing, China.

4. In mid-May 1996, a pilot plant for this study constructed at Stonecutters Island STW site was successfully commissioned, enabling pilot trials to proceed. Pilot trials on chemicals comprise three stages: a preliminary stage to determine the methodology, followed by two rounds of trials. The preliminary trials, commenced on 20 May and completed on 4 June, enabled some initial results for review prior to the IRP visit. The two rounds of trials will commence on 10 June and be completed in late July 1996.

Studies on Disinfection

5. Disinfection studies commenced with an overview of existing disinfection processes, in parallel with the sourcing of chemicals. Five processes including gaseous chlorine, hypochlorite, ultra-violet (UV) irradiation, ozonation and microfiltration were short-listed for more detailed study. In April 1996, a detailed assessment of the short-listed disinfection processes considering their hazards, environmental impacts, costs and space requirements was completed. The assessment recommended further studies be focused on hypochlorite and UV. This will involve laboratory scale tests and pilot scale tests, to be conducted in parallel with the latter part of the pilot trials on chemicals.

IRP Meeting

6. The IRP will meet in Hong Kong 10 - 12 June, and this will be their only meeting for this Study although they are being sent all reports for their comments. The primary objectives of this meeting are for the IRP to give an overall review of the work done thus far, to fine-tune the remaining pilot trials on chemicals, and to provide advice on the disinfection trials about to commence.

**Planning, Environment & Lands Branch
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