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for information

Review of Contaminated Mud Disposal at East Sha Chau: Interim Report III

Purpose

To update members on progress in implementing recommendations for refining the environmental monitoring programme at East Sha Chau, and to inform members about the planned strategy for disposal of contaminated mud up to year 2000.

Background

2. EVS Environment Consultants of Canada, commissioned by the Civil Engineering Department (CED) in September 1994, presented an overview report on the East Sha Chau disposal arrangements to ACE on 17 October 1994. The implementation of the follow-up activities was presented to ACE on 21 November 1994.

3. Interim Reports I & II were circulated for members' information at the ACE meetings on 20 February 1995 and 12 June 1995, respectively.

Work Progress

4. The following summarizes progress since the last update on 12 June 1995:

i) *QA/QC Review*: The QA/QC procedures recommended by EVS were forwarded to the monitoring consultants, for implementation. These procedures have been implemented for all the monitoring activities undertaken at East Sha Chau since March 1995;

ii) *Retrospective Statistical Analysis*: The analysis of the 1994 data by EVS led to a revision of the monitoring programme. The revised programme was adopted in June 1995 for a 6-month trial;

iii) *Sediment Toxicity Testing*: Results of the sediment toxicity tests, undertaken at the EVS Toxicology Laboratory, using infaunal amphipod, polychaete worms and larval oysters showed that the ranges determined for the reference stations overlap or perform slightly below the ranges determined for the exposure stations (samples collected in and around the disposal pit). Therefore, the exposure stations had shown no apparent adverse effects relative to the reference stations;

iv) *Comparative Risk Assessment*: Demersal trawling at West Kowloon Reclamation and Tai Miu Wan began in September 1995 for a 3-month period. When the tissue burden data are available, EVS will undertake a comparison of human health risk with East Sha Chau. This study is expected to be completed in January 1996;

v) *Source Characterization*: Dredged source material was collected from barges as they arrived at East Sha Chau during the month of January 1995. Heavy metal analyses showed that over 40% of the sediments disposed of at the facility could actually be re-classified as uncontaminated. This is probably caused by mixing of contaminated and uncontaminated mud during dredging;

vi) *Sediment Loss Survey*: Two separate surveys were carried out to determine the extent and concentrations of the suspended sediment plumes at various tidal conditions during mud disposal from barges. Estimates of the losses lie in the range of 1.2 to 3.1% for six disposal events. Three other disposal events monitored during slack current condition show no quantifiable loss; and

vii) *Ecological Risk Calculation of the Chinese White Dolphin*: Lack of information on the Chinese White Dolphin in waters outside Hong Kong Territory is a major difficulty. EVS has contacted the following agencies and institutions for information on the distribution, behaviour, foraging activities and diet species for the Chinese White Dolphin: State Oceanic Administration at Hangzhou, China; Office of International Advisory Council at Haikou, China; and Institute of Oceanology at Haiphong City, Vietnam.

Environmental Monitoring Programme Review

5. Based on data from the first 3 months of the 6-month trial programme, EVS undertook a review in October 1995 to determine if there is need for further refinements. As a result, the following changes have been agreed by the Study Management Group, and will be implemented for a 15-month period starting December 1995:

i) The number of reference areas will be reduced from 4 to 2, but there will be 5 stations at each of the reference areas;

ii) The number of exposure stations will be increased from 37 to 61;

iii) Benthos replicates will be reduced from 5 to 1, but a larger grab (12-litre versus 2-litre size) will be used;

iv) The demersal survey will be focused on collection of a sufficient number of target species for analysis of metal concentration in tissue;

v) Sediment toxicity testing will replace the biomonitoring which used green-lipped mussels;

vi) Measurements for different components (sediment, water, benthos etc) will be made at the same time (i.e. within similar tidal condition) and on the same set of stations (i.e. synoptic measurement); and

vii) A rigorous statistical approach will be used to analyze the monitoring data.

6. The study area is divided into reference (absence of potential effects) and exposure (presence of potential effects) zones, and the exposure zone is further subdivided into a pit-cap area, a near-field area and a far-field area. The refinements allow for a more focused and powerful environmental monitoring programme for the East Sha Chau facility.

Development of a Strategy for the Disposal of Contaminated Mud to Year 2000

7. At the 31st Meeting of the Fill Management Committee held on 31 October 1995, FMC members endorsed procedures for development of a strategy for the disposal of contaminated mud from 1996 to year 2000. The following summarizes the strategy for ACE members' information:

i) From late 1996 to the end of year 2000, approximately 20 Mm^3 of contaminated mud is expected to need disposal, but at present there is no provision for disposal after the currently planned Contaminated Mud Pits (CMPs) are filled by mid to late 1996, depending on the rate of disposal in 1996;

ii) A disused sand borrow pit (to the immediate east of the CMPs) originally used by the PAA might be suitable for accommodating the expected demand for contaminated mud disposal capacity to the end of year 2000;

iii) In order for this PAA borrow pit to be used for contaminated mud disposal, two issues have to be considered. First, contained marine disposal at East Sha Chau would have to be reaffirmed as the preferred option for disposal of contaminated mud. Second, an Environmental Impact Assessment (EIA) must be undertaken to examine the nature and extent of potential environmental impacts if the borrow pit is to be used;

iv) In respect of the first issue, EVS will submit in February 1996, a "Status Report on Disposal of Contaminated Mud at East Sha Chau". The EVS study will be a strategic review of the site selection and disposal method, and resulting environmental impacts of contaminated mud disposal at East Sha Chau. Subject to favourable conclusions from the EVS review, the existing design and operation of CMPs will be continued to provide disposal capacity until the EIA is completed in late 1996;

v) To avoid a delay in starting the EIA if it is required, consultant selection procedures will commence now but on a no-commitment basis. If the EVS study indicates that a change is required, the EIA will not be undertaken. Instead, alternative solutions will be examined for disposal of contaminated mud;

vi) EVS have also been asked to review in detail, with EPD's agreement, the regulatory procedures, and in particular Hong Kong's 1992 sediment contamination criteria. At present, mud which does not satisfy the criteria for open sea disposal at South Cheung Chau or East Ninepins is taken for contained disposal at East Sha Chau. The EVS work is expected to lead to recommendations for an additional set of contamination criteria for material un-suited even for contained marine disposal. In this respect, the report will also identify non-marine/treatment methods for such a category of material. It is expected that this report and recommendations will be ready at the end of June 1996; and

vii) If East Sha Chau is reaffirmed as the preferred option for disposal of contaminated mud, the EIA study for the PAA borrow pit will start in about February 1996. On the basis that a new category of contamination will be established as indicated in item vi) above, such material will not be considered in the EIA but instead, the EIA will focus on disposal of mud which is, by definition, suitable for contained marine disposal.

Next Report to ACE

8. The EVS status report will be ready for review in February 1996, and it is proposed that CED reports to ACE on the findings in March 1996.

Geotechnical Engineering Office
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