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15 May 2012

Clerk to the Public Works Subcommittee
Legislative Council Complex
1 Legislative Council Road,
Central, Hong Kong
(Attn: Mr Derek LO)

Dear Mr LO,

Public Works Subcommittee

Letters on
737CL – Dredging, management and capping of contaminated sediment disposal facility to the south of The Brothers
and
345WF – Planning and investigation study of desalination plant at Tseung Kwan O

I refer to your letter of 11 May 2012 to the Secretary for Financial Services and the Treasury, attaching Hon LEE Wing-tat's letters of 10 May 2012 addressed to the Chairman of the Public Works Subcommittee. In response to the questions raised in Hon LEE's letters concerning the captioned public works projects, I am pleased to provide our responses as attached in **Annex 1** and **Annex 2** respectively.

Yours sincerely,

(Jimmy PM CHAN)
for Secretary for Development

Encl.

c.c. Ir Dr Hon Raymond HO Chung-tai, SBS, S.B.St.J., JP
Chairman of the Public Works Subcommittee, w/e
Secretary for Financial Services and the Treasury (attn.: Ms Joyce HO), w/e
Director of Civil Engineering and Development, w/e
Director of Water Supplies, w/e

Annex 1

737CL – Dredging, management and capping of contaminated sediment disposal facility to the south of The Brothers

Q1. Regarding the proposed contaminated sediment disposal facility to the South of The Brothers, the EIA results indicated that with the implementation of appropriate mitigation measures, the potential impact on the water quality by the proposed disposal facility would only confine to the water near the facility. What are the mitigation measures and how the Administration implements the respective mitigation measures? What the description "limit within the nearby area of the facility" shall mean under the approved EIA?

A1 As the proposed works involves mainly dredging, backfilling and capping operations, the EIA report has recommended suitable mitigation measures including the adoption of acceptable working practices (i.e. to limit (i) the dredging rate to not exceeding 100,000m^3 per week for dredging operation, (ii) the backfilling rate to not exceeding 26,700m^3 per day for backfilling operation, and (iii) the deposition rate to not exceeding 26,700m^3 per day for capping operation). To ensure effective implementation of these measures, we will deploy our in-house staffs to supervise the dredging operation and to exercise on-site control over the backfilling and capping operations. This ensures that these operations would be properly conducted following the EIA recommendation and the operational procedures.

Furthermore, we will require the Contractor to deploy suitable plants and machineries for the implementation of these operations to eliminate any accidental impacts due to failure of these plants and machineries. In this regard, we will implement the following good practice on site to enhance further the environmental performance of this facility:

(i) All dredging, backfilling and capping works shall only be carried out within the project boundary

(ii) Recommended numbers and types of plants and machineries (closed grab dredgers, barges and tug boats) shall be deployed for works

(iii) Following completion of backfilling, the contaminated materials shall be covered by a layer of at least 3 metres thick of uncontaminated sediments and/or natural uncontaminated soil to restore the original seabed level

Furthermore, we will coordinate with the management office of the HZMB projects in the vicinity to ensure the respective mitigation measures to be implemented in a coordinated approach. This will further enhance the environmental performance of these projects.

The EIA predicted that the project will induce no unacceptable impact on the water body outside 500m from the facility boundary.

Q2. Has the EIA assessed the impacts due to the proposed facility at its pre-works, during construction and after completion stages covering SS, DO, Heavy metal, nutrients, sediment quality, sediment toxicity, tissue/body contaminant levels, fisheries and benthic assemblages? If affirmative, the respective results. How long would it take for full restoration to the pre-dredged state? How the EIA define the acceptable level for the respective criteria?

A2. The EIA and the associated update review are conducted following the guidelines and requirements of the "Technical Memorandum on Environmental Impact Assessment Process" for the assessment of the potential impacts due to the project. These guideline and requirements are:

- Water quality (covering suspended solid, dissolved oxygen, heavy metal and nutrients) : A quantitative assessment has been conducted following the marine water quality objective stipulated under the Water Pollution Control Ordinance (Cap 358). The assessment criteria includes suspended solids (waste disposal shall not result in an SS elevation above 30% of the ambient environment and shall not cause SS accumulation for causing adverse impact to the marine organisms), dissolved oxygen (90 percentile of the annual samples shall record not less than 4mg/L (depth-average) or 2mg/L (bottom level), heavy metals (referring to EURO standards and accepted by EPD) and nutrients (following WQO).

- Marine ecology : to identify if there exists significant living environment within the project boundary and to conduct the assessment with due consideration of the quality of the environment, the species under concerned, the affected area/number of species, the impact duration,

reversibility, and the magnitude of the impact.

- fisheries : to assess the impact with due consideration of the nature of the impact, the affected area, fisheries abundance and productions, impact and disturbance to the nursing and breeding grounds, impact to capture fisheries and mariculturists.

- Hazard to life (sediment quality, sediment toxicity, tissue/body contaminant level) : the quantitative assessment was conducted following the respective risk assessment guidelines (the accepted risk level was set at not exceeding 1 in 100,000 annually) and the US Environmental Protection Agency guidelines as accepted by Environmental Protection Department.

We have conducted detailed and comprehensive EIA (included suspended solid, dissolved oxygen, heavy metal, nutrients of water quality, marine ecology (included benthic organism), fisheries, Chinese White Dolphins (CWD) and hazard to human health, with reference to the views from local and oversea experts.

- The EIA results showed that dredging, management and capping works of the facility would not have any unacceptable impacts to the environment, complying with the requirements under the Environmental Impact Assessment Ordinance (EIAO).

- Results of the water quality model indicated that the project would comply with all environmental standards and statutory requirements, and the impacts would be transient. It is anticipated that the water quality will be recovered after the capping works shortly, to the level before construction of the facility. The assessment predicted that the respective water quality after implementation of the recommended mitigation measures as mentioned in 1 above would not exceed the WQO requirements in the SS and DO aspects. Whereas the heavy metal, nutrients, sediment quality and sediment toxicity are of significant importance in the health risk assessment for both human and marine mammals. On this aspect, the EIA predicted that the hazard to the both human and marine mammal should be low than the requirement of the corresponding regulation. For the fisheries resource and benthic recolonisation, the assessments are conducted with reference to

the EM&A data of the ESC facility.

- It is predicted that benthic recolonisation will be taking place and the habitat will restore to the original undisturbed state after the capping works of the proposed facility. Latest monitoring data reveal that the recolonisation took place within 3 to 9 months after capping works.

- Given the potential source of impact would be removed shortly after the capacity of the proposed facility been exhausted, it is anticipated the potential impacts arising therefore would be removed when the pits are fully capped (which is about 1 year after the pits are fully filled).

Q3. The EIA predicted that CWD consuming prey at boundary of the proposed facility would have low risk and considered acceptable. What this acceptable means in quantitative terms? The Administration advised that additional survey on CWD and fisheries would be conducted before works, during operation and after completion in collaboration with other concurrent projects. What are these surveys? Could it cover the cumulative impact information arising from these concurrent projects? Would the Administration post this survey information at the internet for public inspection?

A3 The EIA completed a mammal risk assessment for the proposed facility with due reference to the routine dolphin monitoring data published by AFCD and the relevant international standards and guidelines on risk assessment (including those published by the US EPA). The assessment concluded that the risk to dolphins consuming prey from the background areas was similar to that for dolphins consuming prey from the South Brothers (SB) area, and was at an acceptable level.

Regarding the survey for impact on CWD and fisheries resources, we will conduct additional fisheries surveys before commencement of works to

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[1] We will conduct dolphin transect survey using survey vessels to achieve full coverage of the full boundary area of the proposed facility. This survey is to assess the spatial and temporal patterns of distribution, abundance and habitat use of CWD and to use photo-identification analysis for studying individual ranging patterns, core area use and social organization of CWD in details. Survey vessel will travel through preset transect lines running north to south and at regular spacing in the east to west direction to achieve full coverage of survey area.

determine the pre-work condition. For CWD, the dolphin survey[1] will adopt similar method to that of the AFCD's routine survey but focused more on the project area and will last until completion of the proposed works. This survey result can be posted at the project web-site for public inspection.

Q4. According to the available information, can the Administration advised on the abundance of CWD at the western water in the past 5 years? If there is a decreasing trend, the respective reasons?

A4. The EIA completed at only project-based level assessment on the potential impact due to the proposed works on the CWD. For the concern on the distribution and abundance of the CWD in a larger area, we understand that AFCD has been conducting dolphin monitoring on a regular basis and at regular interval. The information would be posted at their departmental web-site for public inspection. AFCD's web-site: http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/con_mar_chi_chi.html

AFCD's information suggests that abundance of CWD at the Northwest, Northeast and West Lantau survey areas may be related to abundance of fishery resources, coastal developments and underwater noise. The EIA predicted that the facility will not induce unacceptable impact to the CWD taking into accounts that the facility is to be sited at area with low to moderate importance to CWD, it will have only transient impact on fishery resources, it will not result in permanent loss of habitat and it will involves operation generating low frequency noise.

Q5. For the EM&A programme of the proposed facility, what would be the proposed sampling method and frequency for the respective water quality, sediment quality, sediment toxicity, tissue and body contaminant level, fisheries and benthic ecology? Would it be more stringent to that of the ESC CMP IV? Would the Administration consider submitting report on the EM&A data and results after works commenced to LegCo annually?

A5. In general, water and sediment quality monitoring will be conducted at monthly interval. Sediment toxicity tests will be 2 times per year (normally

at February and August every year). Tissue and body sampling will be 2 times per year (normally at February and August every year). Recolonisation will be 2 times per year (normally at February and August every year).

The ESC facility has been operated for more than 20 years with satisfactory environmental performance and provides a good indication about the environmental performance for the proposed facility. Nevertheless, considering the site specific characteristic of the project facility and following the conservative principle, we will conduct monitoring works for the SB facility at a closer frequency than that of the ESC facility to obtain the site specific information to safeguard the environmental performance of this new facility. The ESC has in operation for 20 years and the environmental performance of the facility is well proven. For SB, it is a new facility and therefore, we have adopted a conservative approach and increased the monitoring frequency as a precautionary measure.

We consider that the setting up of project-based web-site containing the monitoring data and the relevant details would be more convenient for public inspection and monitoring of the project information. Nevertheless, we will be delighted to submit regular report to the LegCo for members' information if so requested by the LegCo.

Q6. For the proposed facility with two mud pits, can each pit be operating separately in future? Would the pits be used sequentially and the filled pit be capped immediately with clean sediment for restoration?

A6. We have adopted the design of provisioning two smaller pits instead of a single larger one. This allows the smaller pits to be filled up and capped earlier and thus shortens the overall exposure time of the deposited sediment to the adjoining water body. Operation of the facility shall follow this recommended practice such that one of these pits will be filled and its capping works will commence immediately after backfilling. The backfilling operation of the first pit should be completed before the second pit commences to operate.

Q7. Regarding the EM&A results of the ESC facility, locations of the impact and reference stations and how far they are sited from the facility boundary? Any works at the reference station being implemented concurrently at the time of monitoring? Whether the EM&A results of the ESC facility been posted at the internet for public inspection? When dredging works commenced for the new ESC facility?

A7. Impact and reference station：

- Impact station, which are located in areas that have the potential to be affected by the operation of the disposal facility. Generally they are located at downstream of tidal flow and within 2 kilometres (km) (the closest station at 0.5 km) from the disposal facility.
- Reference station, which are located in areas that are remote from the influence of the operation of the disposal facility. Generally they are located at upstream of tidal flow and more than 5.0 km from the disposal facility.

Locations of the stations are shown at the attached sketch。

While the implementation of the EM&A works, no concurrent works was being implemented close to the reference station.

Construction of the new ESC facility commenced in September 2009. Following the requirement of the respective environmental permit, we had pursuant to the EIAO created a project based website and posted the EM&A information and report there for public inspection. Link to the web-page is shown below:

http://www.cmp-monitoring.com.hk/EM&A%20Manual.html

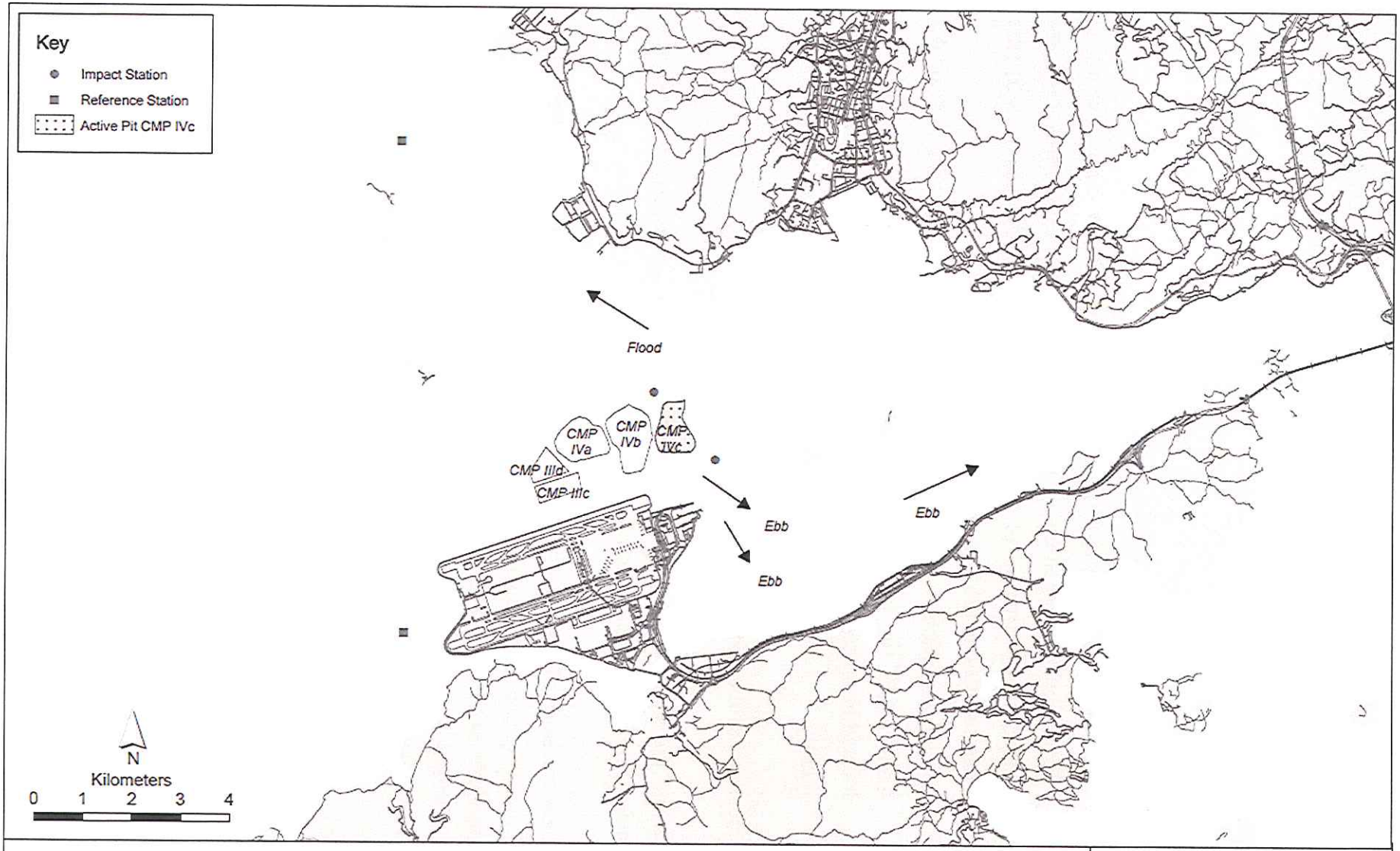

Figure A

Cumulative Impact Sediment Quality Monitoring Stations

Figure B

Routine & Capping Water Quality Sampling Stations

Q8. Regarding the ESC EM&A results, please provide further information on SS covering the period May, August and November 2010, February, May, August and November 2011 and February 2012? Why the SS level at Impact station were higher than that of the Reference station during the period August to November 2008.The SS level at the Impact station was about 8-9mg/L at that time. How is it compared with the EIA prediction? Does the EIA for the purpose of assessing the potential impact assessed and predicted the respective values before works, during construction and after completion? If affirmative, how does the current EM&A results compare with the predicted values?

A8. Information on SS level during the period February 2010 to February 2012 is shown in Chart 1. The EIA has assessed potential water quality impacts associated with the construction and operation of the East of Sha Chau facility. The EM&A data are in general agreement with the EIA predictions, as elevations in SS levels were in general within 3 mg/L.

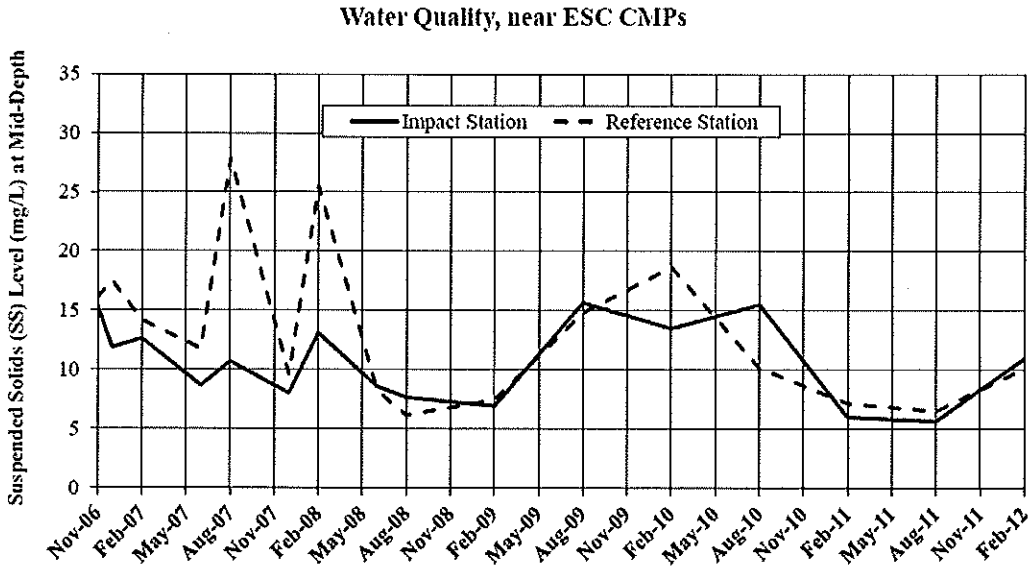

Chart 1 – Suspended solids level measured at Impact and Reference stations

(Remarks - The recorded SS levels at the Impact station are generally lower than that at the Reference station and follow the same trend, which do not suggest any elevation of SS level due to the facility.)

Q9. Regarding the ESC EM&A results, please provide further information on DO covering the period May, August and November 2010, February, May, August and November 2011 and February 2012? Why the DO level at Impact station were lower than that of the Reference station during the period February to August 2008. The DO level at the Impact and Reference station was about 10mg/L at around February 2007 whereas the respective level was about 6mg/L after this period. What would be the reason accounted for it? Does the EIA for the purpose of assessing the potential impact assessed and predicted the respective SS values before works, during construction and after completion? If affirmative, how does the current EM&A results compare with the predicted values?

A9. DO level for the period between February 2010 and February 2012 is shown in Chart 2. The DO levels observed at the Impact stations were well above the Water Quality Objectives (WQO; no less than 4 mg/L) and thus no unacceptable water quality impacts were due to the disposal operation. The EIA has assessed potential water quality impacts associated with the construction and operation of the East of Sha Chau facility. The EM&A data are in general agreement with the EIA predictions, as changes in DO levels were generally negligible and in compliance with the relevant WQO.

We have reviewed our EM&A data for the period between February and August 2008 with reference to EPD's routine marine water quality monitoring data. As the EPD's information recorded at monitoring stations in close proximity to the facility was about 5mg/L in June 2008, which was close to our value at the Impact station and above WQO requirements as predicted.

Despite the recorded DO values at the Impact and Reference station were around 6mg/L since February 2007, the values returned to about 9mg/L in February 2012. Despite DO level of water body will vary depending on its organic contents and temperature, the DO level at the Impact station is similar to that at the Reference station and varies following similar trend, which suggests no depletion of DO level due to operations of the ESC facility.

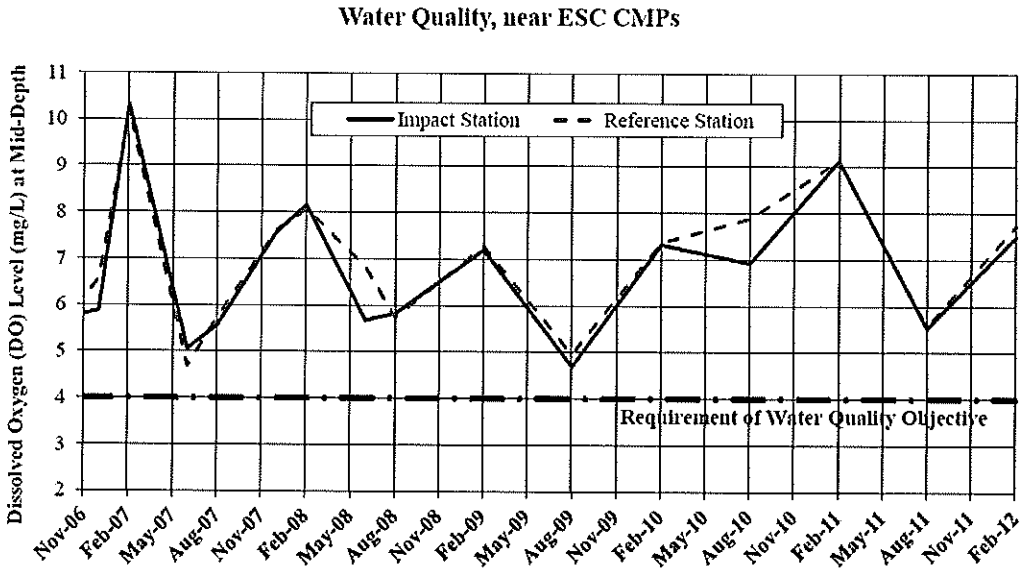

Chart 2 – Dissolved Oxygen level measured at Impact and Reference stations

(Remarks – The recorded DO levels at the Impact station follow generally similar trend as that of at Reference station and all are above the WQO requirement, which do not suggest any deterioration in DO level due to the facility.)

Q10. Regarding the ESC EM&A results, please provide further information on sediment quality and toxicity and contaminant level in the body/tissue of organisms covering the period from November 2006 and February 2012 so as to facilitate the understanding on whether the respective data showed an increasing trend with time? Does the EIA for the purpose of assessing the potential impact assessed and predicted the respective values before works, during construction and after completion? If affirmative, how does the current EM&A results compare with the predicted values?

A10. The EM&A sediment quality monitoring data showed that sediment contaminant concentrations in the North Lantau region did not increase with time. Deterioration in sediment quality, in terms of increase in contaminant concentrations, was not observed in the North Western WCZ. In addition, as sediment contaminant concentrations were similar between Impact and Reference stations, there did not appear to be dispersion of contaminants from the active pits at the ESC area to the broader northern Lantau region.

Sediment toxicity monitoring data are presented in Charts 3 to 7 below. The EM&A sediment toxicity monitoring data showed that similar sediment toxicity between the Impact and References areas, which is reflected by the similar survival percentage of the test organisms in sediments from the Impact and Reference areas. There did not appear to be any evidence of spread of contaminants from the active pit which would lead to higher sediment toxicity in the Impact area. The review findings also show that the sediment toxicity in the Impact and Reference areas did not increase with time. Therefore, there is no evidence of deteriorating sediment quality as a result of the mud disposal operations at the ESC area. Overall, it is considered that the ESC CMPs did not result in unacceptable impacts to sediment toxicity.

EM&A data showed that contaminant concentration in tissues samples of fisheries resources fluctuate slightly over time and no clear increasing/ decreasing trend has been noted during the period when the East of Sha Chau facility was in operation. The concentration of contaminants in tissue samples collected from Impact and Reference stations were similar and therefore no spatial variations have been noted. Where appropriate, monitoring data were compared against the Maximum Permitted Concentrations (MPC) set out by the Food Adulteration (Metallic Contamination) Regulation (CAP. 132V). This is empowered under section 55(1) of the Public Health and Municipal Services Ordinance (CAP. 132). Key findings are summarized below:

- Contaminants concentrations in the majority of the tissue samples tested were reported below the detection limits, indicating that the contaminants were present at very low levels which are of little environmental concern.
- Cadmium and Mercury concentrations were in full compliance with the MPC.
- Less than 1% (only 1 shellfish tissue sample collected in the Reference station) of the tissue samples analysed exceeded the MPC for Lead. No exceedances were found in the remaining samples collected from both Impact and Reference monitoring stations. The exceedance is considered to be an isolated event as no other exceedances have been observed in the large sample size.

- Less than 1% of exceedances in Chromium were found at sample collected in the Impact station. Whereas about 2.7% of exceedances were found at samples collected in the Reference station. As there were more exceedances found in samples collected at the Reference stations which are remote from influence of the facility, there was no evidence suggesting the exceedances were due to the mud pit operation and therefore there is no adverse impact due to mud disposal.

A bioaccumulation assessment was conducted as part of the EIA to assess the potential impacts on biota from contaminant release. The EM&A data are in general agreement with the EIA predictions, as increase in tissue contaminant burden negligible.

The following charts show the toxicity test results of the target species. If sediment disposal has caused an adverse impact on the sediment quality in the nearby of facility, the survival rate of test species at the Impact station shall lower than that at the Reference station. We noted from the charts that survival rates are comparable between Impact and Reference station and following similar trend over time. It suggests no evidence of increasing sediment toxicity was recorded near the pit and over time as a result of any impact due to the sediment disposal operation.

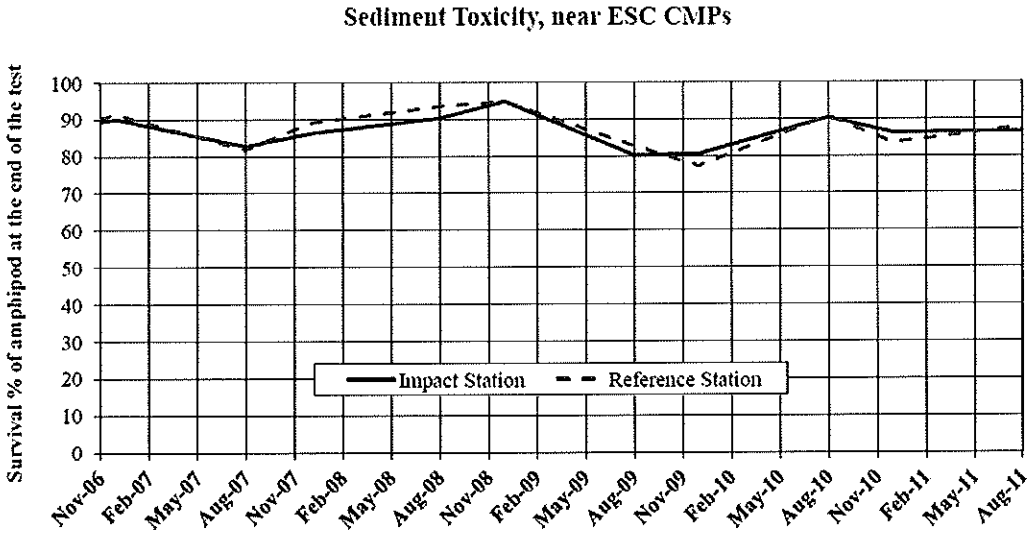

Chart 3 – Sediment toxicity test results for target species using sediment samples at Impact and Reference station

(Remarks : Survival rate at Impact station is comparable to that at the Reference station and varies with similar trend)

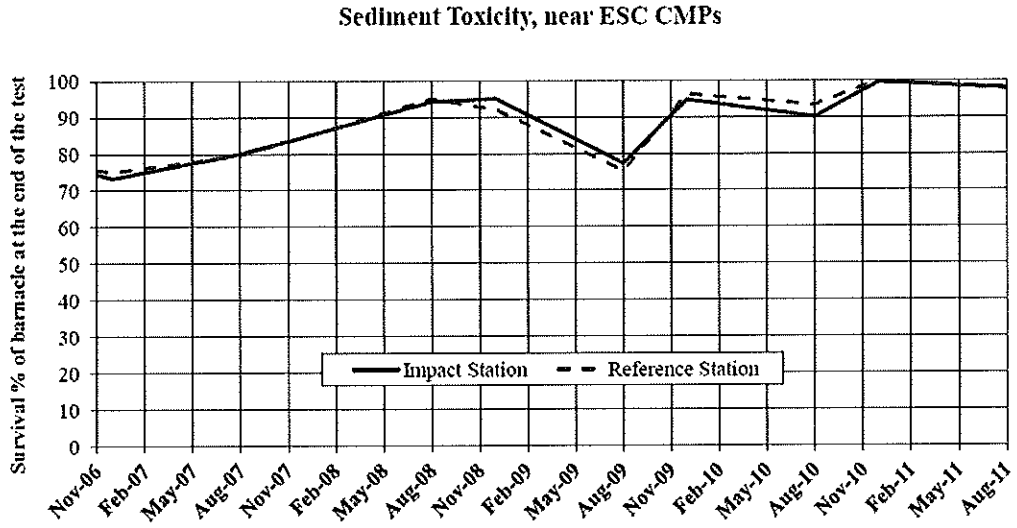

Chart 4 – Sediment toxicity test results for target species using sediment samples at Impact and Reference station

(Remarks : Survival rate at Impact station is comparable to that at the Reference station and varies with similar trend)

Annex 1

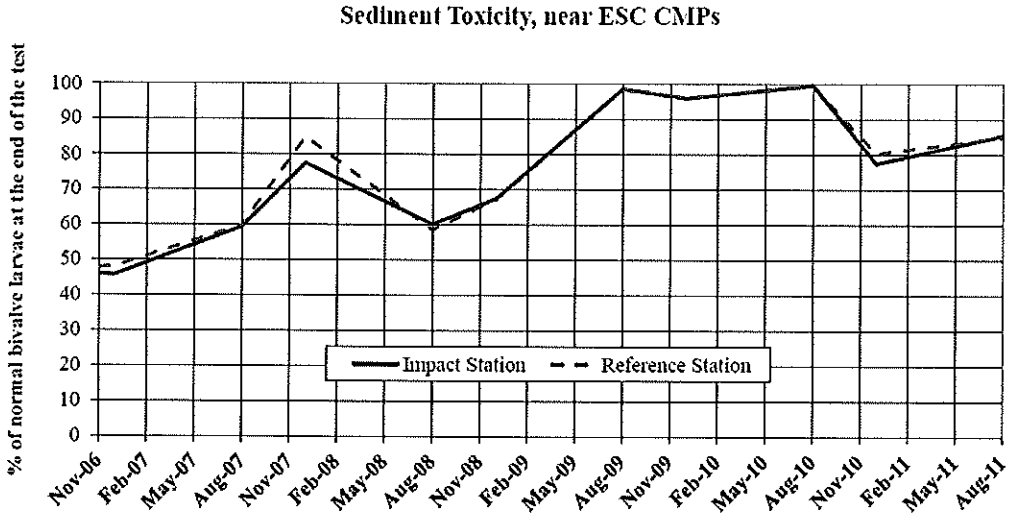

Chart 5 – Sediment toxicity test results for target species using sediment samples at Impact and Reference station

(Remarks : Survival rate at Impact station is comparable to that at the Reference station and varies with similar trend)

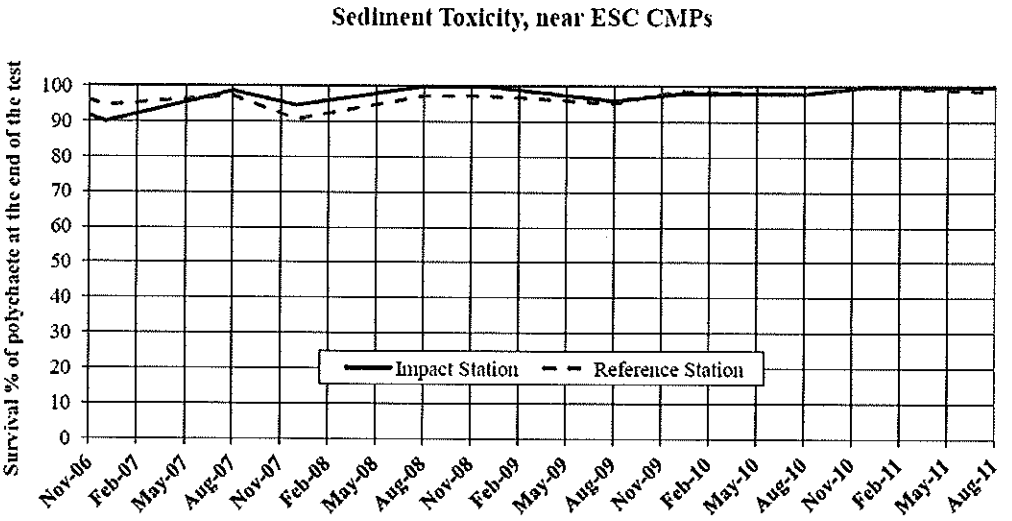

Chart 6 – Sediment toxicity test results for target species using sediment samples at Impact and Reference station

(Remarks : Survival rate at Impact station is comparable to that at the Reference station and varies with similar trend)

Annex 1

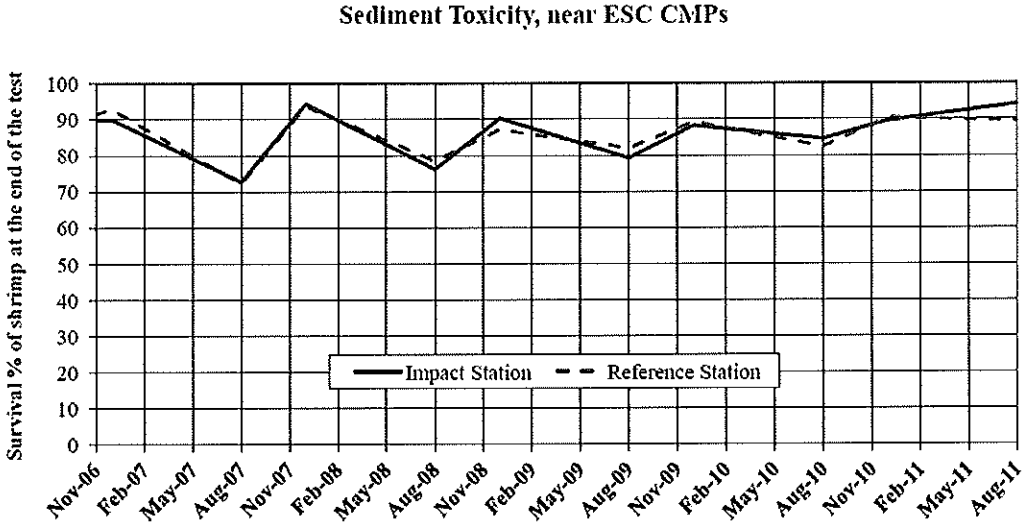

Chart 7 – Sediment toxicity test results for target species using sediment samples at Impact and Reference station

(Remarks : Survival rate at Impact station is comparable to that at the Reference station and varies with similar trend)

Q11. Regarding the ESC EM&A results, please provide further information on benthic recolonisation covering the period from November 2006 and February 2012 so as to show the changes in the period? Does the EIA for the purpose of assessing the potential impact assessed and predicted the respective change in benthic organisms before works, during construction and after completion? If affirmative, how does the current EM&A results compare with the predicted values?

A11. The EIA predicted that benthic recolonisation would occur shortly after capping works. The latest EM&A data of the ESC facility showed that recolonisation commenced within 3 to 9 months after capping works. As the capping works involved clean materials, which would provide similar environment as the nearby seabed, the EIA predicted that recolonisation would continue and finally restore to same as the pre-dredged status.

Past experience suggested that benthic assemblages would generally be fully restored in around 3 years time after capping works. We would conduct survey prior to works of this proposed facility to establish the baseline condition for verifying the restoration time of benthic assemblages at the affected seabed.

Development Bureau
May 2012

Annex 2

345WF – Planning and investigation study of desalination plant at Tseung Kwan O

Q1. What are the areas that the fresh water produced from the proposed Tseung Kwan O desalination plant will supply to? What are the planned future developments and estimated population growth in these areas? How far away of these areas from the proposed Tseung Kwan O desalination plant?

A1. The proposed seawater desalination plant at Tseung Kwan O is a new water resource for augmenting Hong Kong's water supply rather than meeting the planned development or increased population needs in certain specific areas. Preliminary planning is to have fresh water produced from the desalination plant conveyed by the proposed water transfer system to Tseung Kwan O Primary Service Reservoir in which it will mix with the fresh water from Pak Kong Treatment Works and then be distributed to supply areas covering Tseung Kwan O, Kowloon East and Hong Kong Island East. More fresh water, after treatment of the raw water either imported from Donjiang or collected from local catchments, can then be relieved and distributed to other areas in Hong Kong.

Q2. Where are some overseas plants using reverse osmosis technology in desalination? When were these desalination plants built? How many cubic meters of fresh water are provided per annum? What is the production cost of fresh water?

A2. According to the information of International Desalination Association, there are now about 16 000 seawater desalination facilities in the world. Total output is about 24.3 billion cubic metres per annum and 60% of these facilities utilise reverse osmosis technology. Countries using reverse osmosis technology in desalination in recent years include Israel, Spain, Australia and Singapore. Some examples of overseas seawater reverse osmosis desalination plants are detailed in **Table 1** below. Starting with a medium size desalination plant of annual output capacity of about 50 million cubic metres, and followed by expansion for meeting increased needs is rather common overseas practice.

The unit cost of fresh water production by desalination in a number of overseas facilities ranges from HK$9.4 to HK$22.0, with the energy cost representing a significant proportion of this cost. Since energy cost varies substantially in different countries, the said costs cannot be readily applied to Hong Kong. However, with the rapid development in seawater desalination technology, in particular the advancement in energy recovery technology, the current production cost is likely to decrease further. One of the assignments of the consultant study is to carry out detailed investigation of the cost effectiveness of the project.

Table 1 - Examples of Overseas and Mainland Seawater Reverse Osmosis Desalination Plants

	Location	Capacity (mcm/year)	Year of Completion
1	Tuas, Singapore	49.6	2005
2	Perth, Australia	51.1	2006
3	Tianjin Dagang, China	36.5	2009
4	Gold Coast, Australia	48.5	2009
5	Barcelona, Spain	73.0	2009
6	Hadera, Israel	127.0	2010
7	Qingdao Baifa, China	36.5	2012

Q3. What is the change in the unit production of cost of seawater desalination using reverse osmosis technology in past 5 years? What is the trend of the production cost in future? If the trend is downward, how much will it decrease?

A3. According to the result of our earlier study on seawater desalination using reverse osmosis, we estimated that the total production cost (including construction, operation, maintenance and distribution) of fresh water from seawater desalination is about $12 per cubic metre (as compared to the current production cost of HK$7-8 per cubic metre from raw water), based on a unit energy consumption of 4kwh per cubic metre. With the rapid development of the reverse osmosis technology, and in particular the advancement of energy recovery technology, we expect that the energy

consumption can be lowered to about 3kwh per cubic metre thereby further reducing the production cost. The study to be carried out under the proposed funding application will investigate the latest development of technology in details and the amount of energy consumption to be reduced.

Q4. How much Dongjiang water Hong Kong has been bought in the last 5 years? What is the unit price each year? What is the predicted future quantity to be bought and the trend of the unit price? Will it increase and how much it will increase?

A4. The agreed ceiling quantity of Dongjiang (DJ) water supply in the past 5 years was 820 million cubic metres (mcm) per year. The expenditure and the corresponding unit price for purchasing DJ water are tabulated below:-

Year	Expenditure ($ million)	Unit Price ($/m^3)
2007	2 494.80	3.04
2008	2 494.80	3.04
2009	2 959.00	3.61
2010	3 146.00	3.84
2011	3 344.00	4.08

According to the current DJ Water Supply Agreement, the expenditure and the corresponding unit price in the coming 3 years (i.e. 2012-2014) are also tabulated below:-

Year	Expenditure ($ million)	Unit price ($/m^3)
2012	3 538.70	4.32
2013	3 743.30	4.57
2014	3 959.34	4.83

The factors to be taken into account in determining the DJ water price in future include the operation cost, the exchange rate between Renminbi and Hong Kong dollar, as well as the relevant price indices of the two sides.

Q5. In overseas cases, how long will it take to construct a desalination plant using reverse osmosis technology from investigation to completion of construction for production of fresh water supply? For the proposed Tseung Kwan O desalination plant, what is the estimated time required to complete the construction for production of fresh water supply after the completion of planning and investigation study?

A5. The time required for the tasks prior to construction of desalination plant using reverse osmosis technology differs considerably from place to place depending on local environmental regulation, approval procedure, and public consultation procedure required. In general, it ranges from 1 to 3 years; while the time required for detailed design and construction ranges from 4 to 6 years.

Regarding the project on construction of desalination plant, subject to the approval of Finance Committee, we plan to undertake Planning and Investigation Study (under PWP Item No. **345WF**) from 2012 to 2014. We will decide next steps forward depending on the result of the study. If the result of the study indicates that construction of Tseung Kwan O desalination plant is technical feasible and cost effective, we will consider proceeding to carry out detailed design, complete necessary statutory procedures and the construction works.

Q6. What is the total storage capacity of reservoirs in the northeast New Territories? What are the areas in northeast New Territories without sea water for flushing at present? What is the progress of the investigation in providing the reclaimed water for flushing and non-potable use to these areas?

A6. The total storage capacity of the 17 impounding reservoirs in Hong Kong is 586 mcm. The major impounding reservoir located in the northeast New Territories is the Plover Cove Reservoir of which the capacity is around 230 mcm.

In the northeast New Territories, sea water is currently provided for flushing only in Tai Po, Sha Tin and Ma On Shan areas.

Actively considering the use of reclaimed water is one of the key water supply management initiatives under the Total Water Management Strategy promulgated by the Government in 2008. To comply with the Environmental Protection Department's control requirements on discharge to the Deep Bay and to cater for the development of the northeast New Territories New Development Areas, Shek Wu Hui Sewage Treatment Works needs to be expanded. We are exploring the feasibility of leveraging this expansion to upgrade the sewage treatment technology so that the quality of sewage after being treated by a more advanced technology can meet the reclaimed water standard for supplying to the New Development Areas in the northeast New Territories, Sheung Shui and Fanling for toilet flushing and non-potable uses.

Q7. How much water was lost each year in the northeast New Territories due to mains bursts and leaks in past 5 years?

A7. Mains leakage rate is calculated on the basis of the whole supply network. In the past 5 years, mains leakage rate was reduced from 23% in 2007 to 19% in 2011. (details are tabulated below - separate listing of water lost due to mains bursts is not provided because its amount is well below 0.1%).

Year	2007	2008	2009	2010	2011
Mains leakage rate	23%	22%	21%	20%	19%

The target leakage rate in 2015 is 15%. Water Supplies Department will continue implementing various measures concurrently, including replacement of rehabilitation of water mains, pressure management and leak detection, to reduce the leakage rate.

Q8. For the land, about 10 hectares, earmarked for the construction of Tseung Kwan O desalination plant, what are the other suitable planning uses apart from desalination plant?

A8. According to the Tseung Kwan O Outline Zoning Plan, the land earmarked for the construction of the Tseung Kwan O seawater desalination plant has been zoned as "Other Specified Uses" annotated "Deep Waterfront Industry".

The zone is intended primarily for special industries which require marine access, access to deep water berths or water frontage. Industries to be accommodated within this zone are usually capital intensive, land-intensive and cannot be accommodated in conventional industrial buildings.

Development Bureau
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