Yiu Lian Dockyards Limited

Relocation of Yiu Lian Floating Dock No. 3

Environmental Impact Assessment Report

Executive Summary

October 2006

Report no: 01167R071

Hyder Consulting

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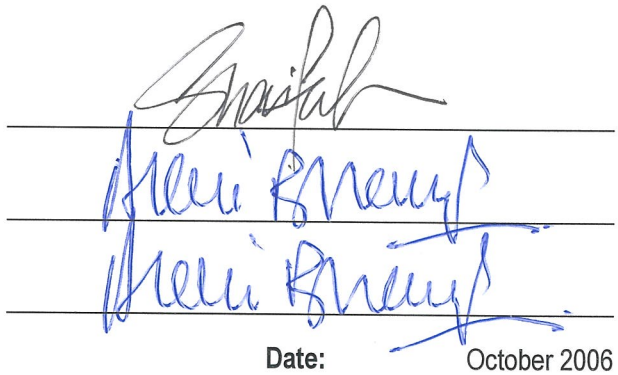

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1 Introduction

1.1 Background

1.1.1 Yiu Lian Floating Dock No. 3 (hereafter refers as “the Dock”) has been in operation at Yam O Wan since 1989.

1.1.2 In 1998, the Government changed the land use proposal for North-East Lantau from the Lantau Port concept to the basis of the tourism and recreation theme. The re-orientation of the planning rendered Yiu Lian’s facilities incompatible with the overall planning context, as the retention of the Dock at Yam O would not fit into the rezoning plan of the area and would constitute interface issues, particularly environmental and visual impacts.

1.1.3 Based on a decision reached at the Committee on Planning and Land Development on 21 December 1999, a revised program associated with the reclamation and proposed developments at Yam O was formulated so as to allow a continuing operation of the Yiu Lian facilities until the expiry of the existing lease term in 2008 in order to minimise any impact upon the facilities. Policy support was secured regarding the possible re-provisioning to the facilities as it had already been identified as being essential in nature for supporting port activities in Hong Kong.

1.1.4 In January 2003, the project proponent notified the Marine Department of the proposal to relocate the Dock from the existing Yam O Wan site to the southwest coast of Tsing Yi Island. The project proponent was subsequently informed that the Marine Department had no objection in principle to the relocation of the proposal.

1.1.5 From April to August 2003, the project proponent notified the Economic Department and Labour Bureau, the Agriculture, Fisheries and Conservation Department, the Town Planning Board, the Planning Department, the Lands Department, and the Antiquities and Monuments Office, of the relocation plan. The project proponent was subsequently informed that the above mentioned departments have no objection in principle to the relocation plan.

1.1.6 There is on-going discussion between the Marine Department and Yiu Lian on if the anchor blocks should be removed from the existing site. Leaving the anchor blocks in place is preferred as it will avoid the disturbance to the seabed and therefore minimise any potential environmental impact of the decommissioning work. This EIA has taken into account the possibility of the removing the anchor blocks from the existing site.

1.2 Description of the Project

1.2.1 The existing floating dock, Yiu Lian No. 3 Floating Dock, is located at Yam O Wan, northeast of Lantua and has been in operation since July 1989. The existing dock is an individual caisson dock with continuous caisson and side wings, suitable for docking vessels of up to 43,000 metric tons, or catering a ship in size up to 43 meters in width and 300 meters in length. The general arrangement of the existing dock is shown in Figure 1-1. Principle dimensions of the Dock are:

Length over all	304.00 m
Length over pontoon	287.00 m
Breadth over pontoon	54.80 m
Breadth of sidewall	3.90 m
Depth of pontoon at centre line	5.00 m
Depth of pontoon at side	4.90 m
Height of top deck at side	18.20 m
Height of safety deck at side	13.90 m
Maximum submerged draught	16.20 m
Floor area	300 m x 54.8m

1.2.2 The proposed new site is located to the southwest of Tsing Yi Island and was used previously by a floating dock named “Apple Dock” for years. The co-ordinates at the four corners of the proposed new site are:

Latitude	Longitude
22°20.110N	114°05.324E
22°20.098N	114°05.353E
22°19.950N	114°05.271E
22°19.979N	114°05.243E

Table 1-1 The Co-ordinates of the Proposed New Site

1.2.3 The locations of the existing site and the proposed new site are shown in Figure 1-2.

1.2.4 Although the relocation of the Dock is a single project, its scope covers two designated projects specified under the Environmental Impact Assessment Ordinance. They are (a) decommissioning of the Dock at Yam O Wan and (b) reinstatement of the Dock at the southwest coast of Tsing Yi.

1.2.5 A Project Profile (No. PP-239/2005) was submitted to Environmental Protection Department (EPD) on 24 January 2005 for applying an Environmental Impact Assessment (EIA) Study Brief under Section 5(1) of the Environmental Impact Assessment Ordinance. An EIA Study Brief (ESB-124/2005) was issued by the Director of Environmental Protection on 8 March 2005. Hyder Consulting Ltd was commissioned by Yiu Lian to undertake the EIA Study in accordance with the EIA Study Brief.

1.2.6 The assessment undertaken and major findings, conclusions and recommendations of this EIA are summarised in this document.

1.3 Construction Programme

1.3.1 The construction works for the relocation of the Dock will take approximately 14 weeks. Due to safety reasons, the relocation of the Dock should avoid the typhoon season which is between May and September. Having considered the safety issues, business commitment and the expiry date of the existing lease term, Yiu Lian plans to relocate the Dock during the non-typhoon season between February 2007 and March 2008.

1.4 Study Objectives

1.4.1 The objectives of the EIA study are as follows:

(i) to describe the Project and associated works together with the requirements for carrying out the Project;

(ii) to identify and describe the elements of the community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including natural and man-made environment and the associated environmental constraints;

(iii) to identify potential Tributyltin (TBT) and heavy metal contamination in marine sediments due to operation of the Dock in Yam O Wan and ways to minimise and mitigate the impacts;

(iv) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses including those along the Sham Tseng coast, especially in respect of marine water and sediment quality impacts;

(v) to identify mitigation measures for the proposed Dock at Tsing Yi with regard to the risk incidence associated with the Caltex and ExxonMobil West terminals at southwest Tsing Yi;

(vi) to propose the provision of mitigation measures so as to minimize pollution, environmental disturbance and nuisance arising from the Project;

(vii) to investigate the feasibility, practicability, effectiveness and implications of the proposed mitigation measures;

(viii) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise from the Project in relation to the sensitive receivers and potential affected uses;

(ix) to identify, assess and specify methods, measures and standards, to be included in the detailed design, decommissioning, construction and operation stage of the Project which are necessary to mitigate these environmental impacts and reduce them to acceptable levels;

(x) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures in the EIA study, as well as the provision of any necessary mitigation measures;

(xi) to identify constraints associated with the mitigation measures recommended in the EIA study; and

(xii) to design and specify the environmental monitoring and audit requirements to ensure the effective implementation of the environmental protection and pollution control measures.

2 Evaluation of Environmental Impacts

2.1.1 The key findings of the EIA Study are summarised in the following.

2.2 Water Quality

2.2.1 The relocation of the Dock from Yam O Wan to the south western coast of Tsing Yi requires a small scale of the marine sediment dredging and backfilling at the new site, and dredging at the existing site if the removal of the anchor blocks is required. The key environmental issues of the dredging are the potential release of suspended solids (SS) and associated contaminants into the water column, thus affecting the marine environment and sensitive receivers (SRs).

Baseline Conditions

2.2.2 The baseline environmental condition in the study areas has been reviewed with reference to the Marine Water Quality in Hong Kong 2004 and the marine water quality data collected from this EIA Study. The baseline water quality at both the existing dock and the proposed new site is generally good except for copper, which exceeded the recommended water quality standards at both sites. The *E Coli* level in the vicinity of the proposed new site is high, most likely caused by the disposal of sewage effluents from the Stonecutters Island Sewage Treatment Works.

2.2.3 Representative sediment samples was collected at both the existing dock site and proposed dock site. The concentrations of Copper, Lead, Zinc, Mercury and Arsenic of some sediment samples from the existing site exceed Upper Chemical Exceedance Level (UCEL). The sediments at the existing dock site is classified as Category H in accordance with the Environment, Transport and Works Bureau Technical Circular (Works) No. 34/2002, Management of Dredged/Excavated Sediment. The seabed at the proposed new dock site at Tsing Yi is also slightly polluted with heavy metals and organic PAHs and the sediment is classified as Category M.

Construction Phase

2.2.4 The elutriation tests have been carried out to determine the releasing potential of various contaminants from the sediment into the receiving water during dredging works. The nearest SR identified in the study areas is located some 1800m away from the existing dock site and over 3000m away from the proposed new dock site. The potential water quality impacts have been quantitatively assessed. It was found that the release of SS and other associated toxicants from the dredging would be minimal and insignificant to the SRs.

2.2.5 The average sediment contaminant levels at the existing site are typical in the coastal area of North Western Water Control Zone and similar to or lower than in typhoon shelters of Hong Kong waters. The biological screening tests results indicated that the marine sediment at the existing site is not suitable for open sea disposal. However, the proposed construction method will reuse all the marine mud and no disposal is required. The bioaccumulation test was undertaken to assess the bioaccumulation potential on the benthic organisms at the existing site. Test results indicated that the bioaccumulation potential of the marine sediment is low. Having reviewed the international practice and local experience, leaving the sediment in place is the best option for the handling of marine sediment at the existing dock site.

Operational Phase

2.2.6 A literature review on non-TBT paints commonly used in the dock operation has been undertaken. It is found that the most common and widely used

TBT free antifouling paint is copper based. No significant environmental consequences have been reported ever since copper was used as a replacement of TBT in anti-fouling paints. Both International Maritime Organization and Green Peace concluded that copper is less harmful than TBT. There are other toxic substances in the non-TBT paints. However, they are in trace amount and will not cause any significant impacts to the environment. Research suggests that the key environmental concern of the antifouling paint mainly results from their leaching into marine environment during ship navigation.

2.2.7 The main potential environmental impacts during the operation stage results from hull washing. Effluent samples from hull washing were collected and the analytical results were used to study the potential impacts of the effluents discharged into the marine waters on the SRs. Assessment results indicated that the water quality impacts resulting from hull washing would be limited to the immediate vicinity of the discharge point and the adjacent SRs will not be affected. However, in order to further minimise the potential water quality impact, it is recommended to provide a settling system to further improve the effluent discharge quality.

2.2.8 There is an existing treatment system on the dock for the treatment of domestic wastewater. Samples at the domestic wastewater discharge point were collected and tested and the performance of the treatment system was found acceptable. The domestic wastewater generated on the dock at the proposed site will continue to be collected and treated using the existing system. The potential water quality impact assessment has been undertaken based on the amount of the domestic waster generated from a maximum number of workers on board. Results indicated that the domestic effluent discharge could meet the discharging standards of the Western Buffer Water Control Zone and there would be no impact to the adjacent SRs.

2.2.9 Yiu Lian Floating Dock No. 1 and the United Dockyard are also located in the south western coast of Tsing Yi. The cumulative water quality impact caused by the operation of all those docks concurrently has been studied and it was found that they would not impact on the adjacent SRs.

2.2.10 The potential TBT leakage of the TBT containing antifouling paint into the marine environment， is a common concern during the operation of a floating dock. However, the use of TBT antifouling paint will be prohibited by 2008 when the International Convention on Control of Harmful Anti-fouling Systems on Ships will be enforced. In fact most ships have already stopped using the TBT containing paints. After the relocation of the Dock, Yiu Lian will cease to receive any TBT paint vessels in order to minimise the potential environmental impacts on the marine water quality. A comprehensive ship receiving procedures has been developed to serve this purpose.

2.3 Waste Management

Construction Phase

2.3.1 The proposed construction method for either decommissioning the existing Dock or commissioning the Dock at the Tsing Yi site will not require any disposal of marine sediment.

2.3.2 Nine new anchor blocks, which have been precasted in China, will be used for the installation at the proposed new site for safety reasons. Therefore, there will be nine surplus old concrete blocks from the existing site. These concrete blocks will be retrieved and reused in Hong Kong or China.

2.3.3 The general waste generated during the construction phase of the Project will be temporarily stored on working vessels and disposed of in accordance with the Yiu Lian's existing waste management system. Therefore, there will be no waste related environmental impacts.

Operational Phase

2.3.4 The existing waste management system implemented for the Dock has been reviewed. All the wastes are handled and disposed of properly in accordance with the relevant environmental legislations and guidelines. Therefore, the current waste management practice is considered appropriate for the future operation. However, good site practice and waste reduction measures are recommended for further improvement.

2.4 Air Quality During Operation Stage at Tsing Yi

2.4.1 The electricity supply for the future dock operation at Tsing Yi will rely on the diesel-powered generators on the Dock, which are identified as the major air pollutant emission source.

2.4.2 Yiu Lian Floating Dock No. 1, which is located to the northeast of the Dock, and also contains diesel-powered generators on board, may also contribute to the air pollution at the sensitive receivers.. The potential cumulative air quality impact from both sources has been assessed quantitatively. The predicted SO_2 and NO_2 concentration at all identified air quality sensitive receivers are well below the Air Quality Objectives. The air quality impact caused by the future dock operation is negligible.

2.5 Hazard Assessment for the Dock at Tsing Yi

2.5.1 The proposed dock is sited within consultation zone of the Caltex Terminal (CT) and ExxonMobil West Terminal (EMWT) in the west of Tsing Yi. A Hazard to Life Assessment has been undertaken to identify mitigation

measures for the proposed Dock at Tsing Yi with regard to the risk incidence associated with the terminals.

2.5.2 The relocation activities within the consultation zone and the operation activities at the new site have been reviewed and mitigation measures including an evacuation plan have been recommended. The evacuation plan is developed for the operation of the Dock at the new Tsing Yi site. It contains emergency organizations, evacuation pre-arrangement, communication channels and evacuation procedures (including evacuation routes) in response to a major incident that may occur at the CT or EMWT.

2.5.3 Provided that the recommended measures are implemented properly, the risk to the workers/personnel working at the proposed dock site can be minimised to an acceptable level.

2.6 Oil Spillage during the Dock Operation at Tsing Yi

2.6.1 Accidental oil spillage from the vessels at the Dock has the potential to cause water pollution at the nearby WSRs although the oil spillage associated with the floating dock operation is rare. However, all WSRs are separated from the Dock by the fast flowing channels. It is unlikely for any oil spills from the Dock to across the channels and to affect the WSRs within 6 hours from the incident. An Oil Pollution Contingency Procedure has been developed by Yiu Lian and improvement in the preventive measures has been recommended by this EIA. With the full implementation of the Oil Pollution Contingency Procedure and the improved preventive measures, the risks of the potential water pollution resulting from any oil spillage incidents can be limited to an acceptable level. The Dock relocation will lead to a reduction in the pollution risk level at Ma Wan Fish Culture Zone as the Tsing Yi site is further away than the existing site from the fish culture zone.

3 Environmental Monitoring & Audit

3.1.1 A comprehensive Environmental Monitoring and Audit (EM&A) programme for the construction and operation phases has been recommended. The EM&A requirements cover water quality monitoring, implementation schedule of the environmental protection/mitigation measures, EM&A reporting procedures and complaint handling procedures. The Manual is a full reflection of the recommendations made from the EIA Report. Details of the programme are presented in a separate EM&A Manual.

4 Summary and Conclusions

4.1.1 The EIA Study has assessed the potential environmental impacts including

water quality, air quality, waste management and hazard to life associated with the proposed project. The study concluded that all the environmental impacts would be in full compliance with the relevant environmental legislations and standards. However, appropriate mitigation measures and good site practice have been recommended to further improve the environmental performance of the proposed project.

4.1.2 The decommissioning of the existing Dock at Yam O Wan will improve the overall environment and in particular the visual environment of this area. It is also in line with the overall planning context for tourism and recreation theme for this area. In addition, it will provide benefit to the inshore fisheries and marine ecology in this coastal area as the vessel disturbance and industrial wastewater discharges from the Dock operations will disappear.

4.1.3 The unsightly visual impact of the existing dock imposed on the passengers and drivers of North Lantau Express Way, MTR Tung Chung Line, Airport Express Way and the ferries passing through the waters between Urmston Road and Ma Wan Channel, will disappear after the Dock relocation.

4.1.4 The proposed new site is at the southwest coast of Tsing Yi Island. The land use along this coastal area is industrial. The relocation of the Dock to this area is compatible with surrounding land use.

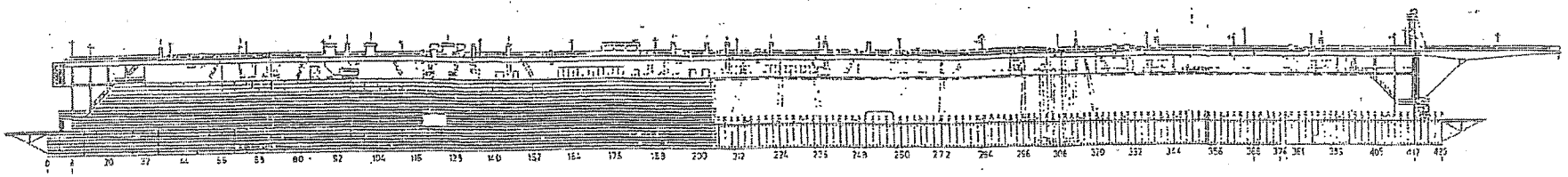
4.1.5 After relocation, the Dock will no longer receive any ships with TBT-containing paint for maintenance, ahead of the schedule imposed by the International Convention. Therefore, the most critical environmental problem associated with the Dock operations will no longer exist, leading to an improvement in the environment.

4.1.6 With the full implementation of the Oil Pollution Contingency Procedure and the preventive measures, the risks of the potential water pollution resulting from oil spillage from the Dock can be limited to an acceptable level.

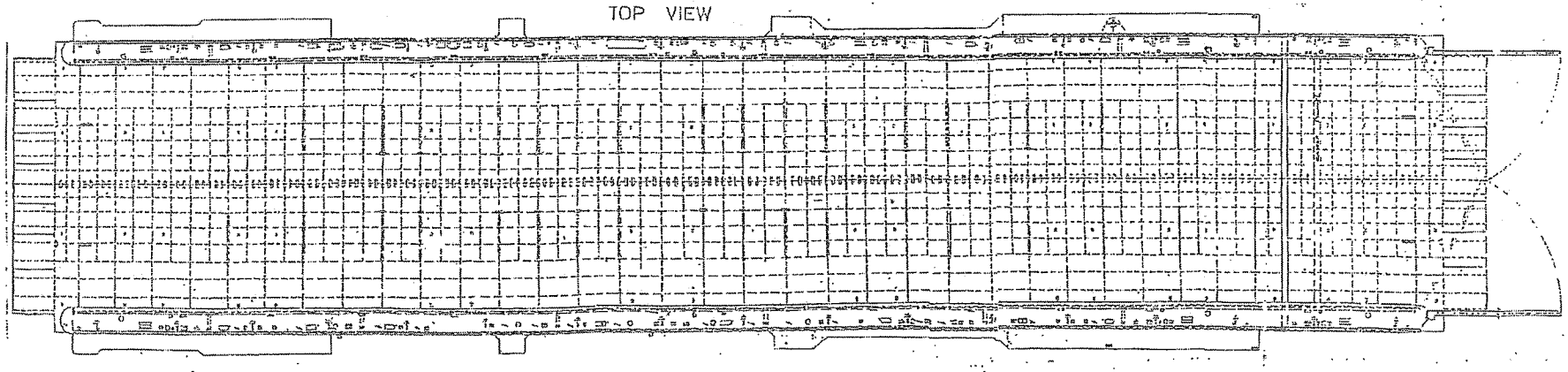
4.1.7 The Dock relocation will lead to a reduction in the pollution risk level at Ma Wan Fish Culture Zone as the Tsing Yi site is further away than the existing site from the fish culture zone.

Principal dimensions:	
Length over pontoon	304.00 m
Breadth over pontoon	54.80 m
Breadth of sidewall	3.90 m
Depth of pontoon at center line	5.00 m
Depth of pontoon at side	4.90 m
Height of top deck at side	18.20 m
Height of safety deck at side	13.90 m
Maximum submerged draught	16.20 m

縱剖面
LONGITUDINAL SECTION



頂視圖
TOP VIEW



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