

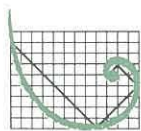
Environmental Protection Department

Centralised Incineration Facility  
for Special Wastes: *Volume 1*  
*Executive Summary*

March 1995

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EIA-003.1/95

EIA/003.1/95

Environmental Protection Department

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March 1995

Reference C1127b

For and on behalf of ERM Hong Kong

Approved by: *Mr. Walker*

Position: *TECHNICAL DIRECTOR*

Date: *3 MARCH 1995*

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## 1.1

**BACKGROUND TO THE ENVIRONMENTAL IMPACT ASSESSMENT**

This Executive Summary of the Environmental Impact Assessment (EIA) for the proposed Centralised Incineration Facility for Special Wastes (CIF) in Tuen Mun Area 38, has been produced by Environmental Resources Management (ERM) Hong Kong. The Project has been commissioned by the Waste Facilities Planning (WFP) Group of the Environmental Protection Department (EPD) as part of the ongoing development of a modern incineration facility for special wastes in Hong Kong.

The special wastes which will be disposed of at the CIF consist of:

- clinical wastes collected by the CIF operator or delivered privately;
- animal carcasses collected by the Urban and Regional Services Departments, the Agriculture and Fisheries Department and private bodies; and
- security wastes requiring witnessed destruction by police, customs and excise and other Government departments.

The EIA was commissioned to review the findings of two previous studies, the *Centralised Incineration Facility For Special Wastes – Phase I: Feasibility Report* and *Key Issue Report – Environmental Review* and to undertake an assessment of the key issues relating to the potential environmental impacts that may arise from the construction and operation of the CIF.

The environmental feasibility of the CIF was ascertained in the Phase I Report, this EIA updates this work and addresses the recommendations of the Key Issue Report. The findings of the EIA will be used to identify the requirements for a Detailed Design Stage EIA which will be undertaken by the successful tenderer, to verify the environmental acceptability of the proposed design, develop effective mitigation recommendations and outline an environmental monitoring and audit (EM&A) programme.

These will be incorporated in the Design/Build/Operate Tender Requirements and Contract Clauses for the CIF, as environmental protection clauses to ensure that impacts are controlled within the established standards and guidelines.

## 1.2

**THE CENTRALISED INCINERATION FACILITY**

The CIF will improve the current clinical waste disposal practices of substandard incineration in existing hospital incinerators in urban areas, or landfilling. Neither of these methods is considered acceptable to the Hong Kong Government. It will also provide a facility for the disposal of animal carcasses and security wastes which are currently burnt in other incineration units scheduled for closure.

The CIF will be located within Tuen Mun Area 38 on reclaimed land at Siu Lang Shui to the south of the Castle Peak hills within a Special Industries Area (SIA). The feasibility of the SIA was confirmed in the *Expanded Development Study of Tuen Mun Area 38*. Figure 1.2a shows the site in relation to the overall study area. The nearest villages to the site are about 2 km to the north-west whilst the nearest housing developments are more than 3 km to the north-east.

To the west of the CIF site are existing industrial facilities including the China Cement Plant and Castle Peak Power Station. The Shiu Wing Steel Mill to the immediate west of the site is under construction. Along the coast to the east there are a number of waterfront developments and the Pillar Point Sewage Treatment Plant. Other landuses on the slopes to the north of Lung Mun Road include water service reservoirs, Pillar Point Valley Landfill and the restored Siu Lang Shui Landfill.

### 1.3 SCOPE OF THE STUDY

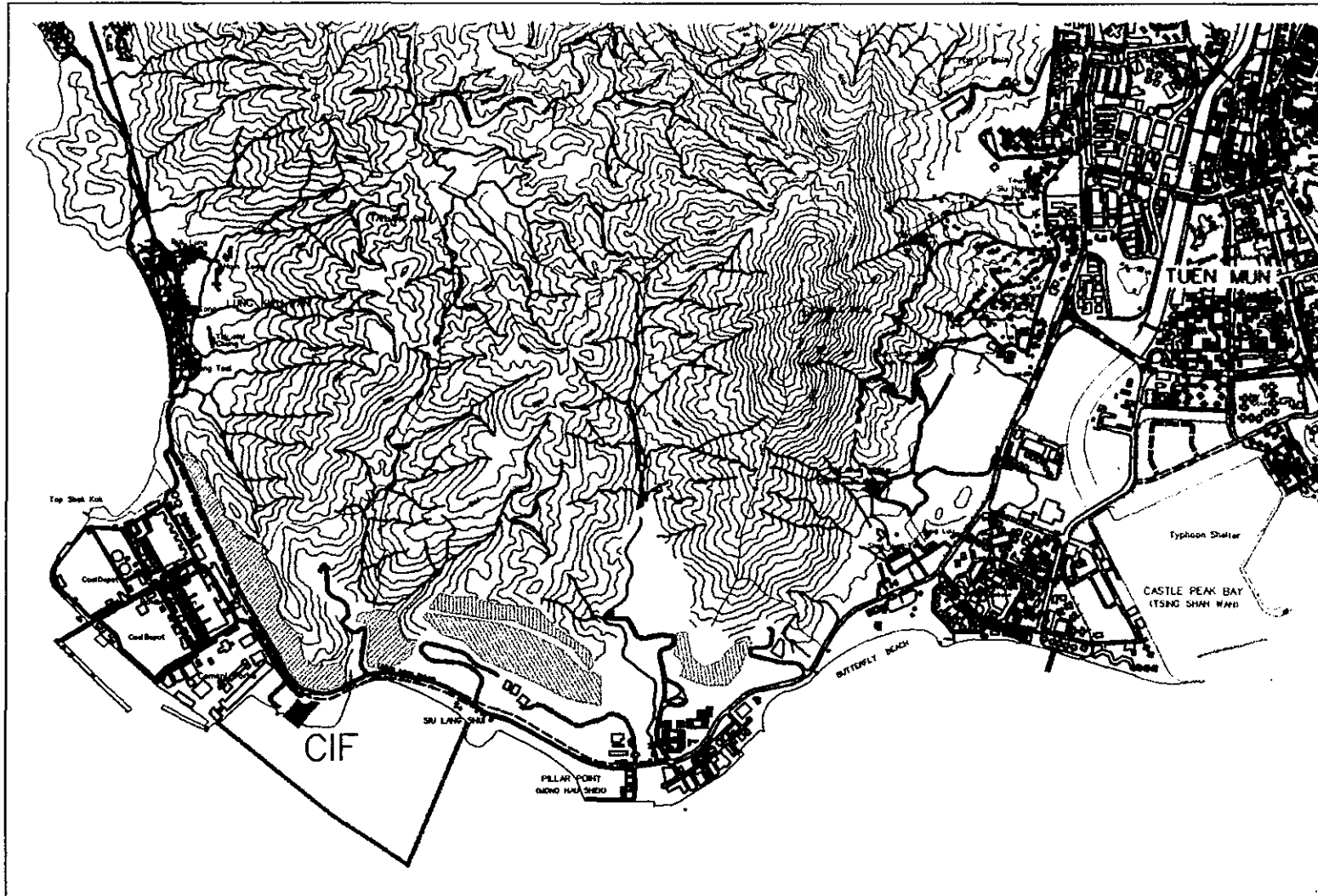
The scope of the CIF EIA has been identified in the Study Brief as follows:

- To identify and evaluate the net and cumulative impacts, identified in the *Key Issue Report – Environmental Review* as requiring further investigation, during the construction and operation phases of the development.
- To minimise pollution and nuisance arising from the development during its construction and operation.
- To identify methods, measures and standards in the design of the facility necessary to mitigate these impacts and reduce them to an acceptable level.
- To recommend any further monitoring and audit requirements necessary to ensure the effectiveness of the environmental protection measures.

### 1.4 STRUCTURE OF THE REPORT

The findings of the EIA Report are presented in detail in *Volume 2* and here in an Executive Summary in the following manner:

- *Section 2* sets out the background to the proposed facility, the outline design and operating procedures for the CIF;
- *Section 3* describes the impacts predicted to occur during construction works and makes recommendations for mitigation as necessary;
- *Section 4* addresses the impacts predicted to occur during operational activities and makes recommendations for mitigation as necessary; and
- *Section 5* puts forward the recommendations to be incorporated into the Tender Requirements and Contract Clauses for the construction and operation of the CIF to ensure that impacts are controlled to acceptable levels.



**FIGURE 1.2a CENTRALISED INCINERATION FACILITY - SITE LOCATION**




Date : 5 JAN 1995

Project No.: c 1127b

Map drawn by GIS and Mapping,ERM

Base map from LANDS DEPT. 1:20k topo

**KEY**

-  CIF site
-  SIA reclamation area
-  Slope/Cliff

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## 2.1

*THE NEED FOR THE CIF*

Clinical wastes are potentially infectious and hazardous and if not properly handled may present health risks to the public and workers. They can also be offensive in appearance. Incineration has been identified as the most reliable method for reducing the bulk, and completely changing the appearance of all types of clinical wastes, rendering them harmless in the process.

Currently, a certain proportion of clinical wastes are incinerated at local hospitals, but because of the lack of adequate capacity, the remainder is diverted to landfills for disposal. No existing hospital pathological incinerators are fitted with gas cleaning equipment and none of them meet the standards stipulated in the Air Pollution Control Ordinance (APCO). As it is neither cost-effective nor technically feasible (in most cases) to retrofit them, a new incineration facility is required to replace the existing units.

A centralised incineration facility is preferred over a number of smaller sub-regional incinerators for reasons of economy of scale and ease of control of operational standards. In addition, hospitals are by definition sensitive receivers and the use of a separate centralised facility will reduce potential impacts on the hospitals themselves and their surrounding environment. The CIF, together with proposed legislative control of the handling, packaging, storage, delivery and disposal of clinical wastes will provide a cradle-to-grave solution for managing the disposal of clinical wastes.

Existing disposal arrangements for animal carcasses and government security waste are unsatisfactory. At present, animal carcasses arising from livestock rearing activities and abattoirs are either treated at substandard cremators or disposed of at landfills. Both methods are environmentally unacceptable. The phasing out of the Kwai Chung Incineration Plant in 1997 will remove the only disposal outlet for security waste. The CIF is, therefore, also required for the disposal of these wastes.

## 2.2

*PROJECT DESCRIPTION*

## 2.2.1

*Introduction*

This section contains a brief description of the project for the purposes of setting the scene for the EIA. The actual design of the CIF which will be built by the successful tenderer is likely to differ in many aspects but will be based on the same general requirements.

*Figure 2.2a* shows a notional site layout including the access from Lung Mun Road and the southern section of the site which is yet to be reclaimed. The main structures will be the incinerator building and animal cremator, approximately 10-15 m high, with a single stack approximately 60 m high.

The tender period for the CIF extends to December 1995 and the facility is intended to become operational in mid-1997.

### 2.2.2 *Waste Transportation and Processing*

The findings of previous phases of the Study and updated waste arisings figures indicate that an incineration facility with a total capacity of 40 tonnes per day (including contingencies) is required to dispose of wastes up to the year 2012.

Clinical waste will be delivered to site in closed containers by dedicated vehicles and by private agencies. Animal carcasses will be delivered by Government and private vehicles and security waste by the appropriate Government departments.

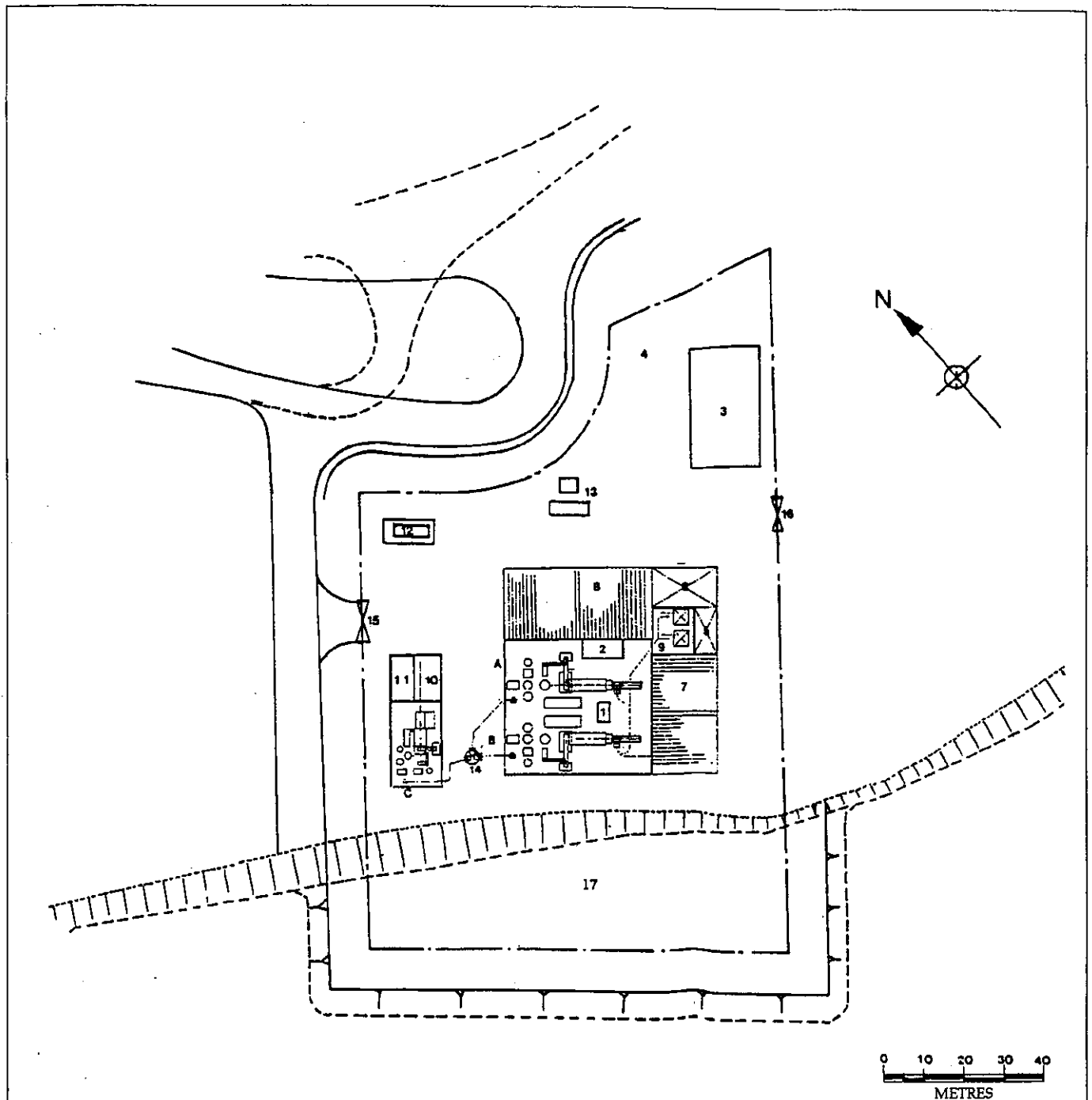
Deliveries will generally occur during daytime working hours (08.30 - 18.00) to dedicated storage. All deliveries of clinical waste will be tracked from source by a ticketing system and load weights will be checked by a weighbridge at the main gates as well as by the weighing of individual skips prior to loading into the incinerator.

### 2.2.3 *Incineration System*

The incineration plant and air pollution control equipment will be designed to meet the proposed combustion and stack gas emission criteria. The facility is expected to consist of continuous incinerators for clinical waste and a batch operating cremator for animal carcasses. The main components of the plant will be:

- an automatic loading system ensuring safe loading and combustion conditions by controlled input;
- a primary combustion chamber where the waste is gassified and separated from non-combustible materials;
- a secondary combustion chamber where high temperature, surplus oxygen and a sufficient residence time ensure complete combustion;
- a gas cleaning plant capable of treating emissions to acceptable levels; and
- a multi-flue stack of sufficient height to ensure the effective dispersion of the treated gases.





**MAIN PLANT**

- A - CLINICAL WASTE INCINERATOR I
- B - CLINICAL WASTE INCINERATOR II
- C - ANIMAL CREMATOR

**AUXILIARY PLANT**

- 1 - CONTROL ROOM
- 2 - AMENITY BLOCK
- 3 - VEHICLE GARAGE AND WORKSHOP
- 4 - PARKING SPACE
- 5 - SKIP UNLOADING BAY
- 6 - SKIP LOADING BAY
- 7 - FULL SKIP STORAGE AREA
- 8 - EMPTY SKIP STORAGE AREA
- 9 - SKIP WASHING BAY

- 10 - CREMATOR RECEPTION AREA
- 11 - CREMATOR REFRIGERATED STORAGE AREA
- 12 - FUEL TANK
- 13 - WEIGH BRIDGE
- 14 - CHIMNEY
- 15 - ACCESS GATE
- 16 - EMERGENCY ACCESS GATE
- 17 - SITE FOR FUTURE EXPANSION

FIGURE 2.2a - CONCEPTUAL SITE LAYOUT

**ERM Hong Kong**

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 Hecny Tower  
 9 Chatham Road  
 Tsimshatsui, Kowloon  
 Hong Kong



### 3 *IMPACTS DURING CONSTRUCTION*

#### 3.1 *INTRODUCTION*

This section identifies and assesses the impacts predicted from construction activities and recommends mitigation measures designed to control any unacceptable impacts and meet the appropriate environmental criteria.

Whilst the CIF is under construction, other major infrastructure and development projects will also be underway in the vicinity. Cumulative effects arising from the CIF, existing and planned landuses were considered.

#### 3.2 *AIR QUALITY*

Dust impacts arising from the construction of the CIF are expected to be within established standards and guidelines. However, due to the already high dust levels in the area, it is recommended that dust emissions be minimised by the employment of good site management and construction practices. The Contractor will be required to ensure that dust emissions from the site do not breach the established standards and guidelines.

#### 3.3 *NOISE*

The detailed design of the CIF and the exact construction schedule are not yet available. Therefore, this assessment has been based on a number of conservative assumptions concerning the construction techniques and resultant noise levels that may be generated. These are to be confirmed at the detailed design stage.

The relatively remote location of the CIF, away from noise sensitive receivers (NSRs), means that noise from construction activities on the CIF site is unlikely to breach the requirements of the established standards and guidelines. The Contractors will be required to obtain construction noise permits for evening, night-time or general holiday working, or if percussive piling is necessary.

The CIF site is currently used for container storage and has a higher vehicle capacity than will be the case during either construction or operation of the CIF. Traffic noise calculations have shown that the CIF construction vehicles will not lead to an increase in traffic noise.

#### 3.4 *WATER QUALITY*

The reclamation of the CIF will be completed as part of the overall Area 38 development before the site is handed over to the CIF Contractor. Previous Tuen Mun Area 38 Development studies have already shown that the potential for construction impacts on the marine environment due to the Territorial Development Department's reclamation work will comply with the established standards and guidelines.

Potential impacts from the construction of the CIF will arise from typical land based construction activities which involve construction run-off and drainage; litter and debris; spillages; and sewage disposal. If proper site management and good construction practices are implemented, it is unlikely that construction activities would result in non-compliance with the Water Quality Objectives (WQOs). However, a discharge licence will be required and wastewater controlled and treated, if necessary prior to disposal, to the levels set out in the Technical Memorandum on Effluent Standards (TM).

### 3.5 *LAND USE AND VISUAL IMPACTS*

The CIF will be built amongst land uses which have been planned as a whole in preceding Tuen Mun Area 38 Development studies. Therefore, there will be no significant land use impacts. The construction of the CIF will be undertaken on a small section of the newly reclaimed land farthest away from sensitive receptors, when compared to the other developments in the area. Thus, the construction of the CIF will be undertaken against a backdrop of other industrial developments and no additional visual impacts are likely.

### 3.6 *WASTE MANAGEMENT*

Excavated material will either be reused on site, used on other reclamation or construction projects, or as a last resort sent for disposal at a public dump or landfill as appropriate. The material will be removed from site by road by licensed disposal operatives. No adverse impacts will be associated with vehicle movements or from the disposal of waste from the CIF.

### 3.7 *LANDFILL GAS*

The restoration of Siu Lang Shui Landfill (SLSL) is at an early stage and the proposed measures for landfill gas and leachate control have yet to be installed and proven effective. Once in place, these measures should have a considerable influence on any hazards and precautionary measures that need to be incorporated into the construction and operation of the CIF.

Only a small section of the north-eastern boundary zone of the CIF site is within the SLSL landfill gas 250 m Consultation Zone. This means that it is unlikely that any precautionary measures against landfill gas ingress will be required to be incorporated specifically into the CIF design other than those measures required for the SIA as a whole.

## 4.1

*INTRODUCTION*

This section identifies and assesses the impacts predicted from operational activities and recommends mitigation measures designed to control any adverse impacts to meet the established environmental standards and guidelines. Cumulative effects arising from the CIF, existing and planned landuses were considered.

## 4.2

*AIR QUALITY*

The potential short and long term air quality impacts from the CIF during its operational phase were predicted using data for Lau Fau Shan Meteorological Station. The modelling results show that, for the substances covered by the Air Quality Objectives (AQOs), the CIF operating at full load will not lead to adverse air quality impacts on the surrounding environment, including identified sensitive receivers, that exceed the established standards and guidelines.

Operations at the CIF will involve transport, reception, handling, storage and removal of materials that could give rise to dust emissions. These are likely to include chemicals to treat stack gases and process water, ash from the incinerator and dewatered sludge from the water treatment plant. During water treatment and waste handling, there is potential for odour nuisance.

The operation of the CIF will lead to a reduction in emission rates from clinical waste incineration throughout the territory. Modelling results predict that stack gas emissions from the CIF will comply with the established standards and guidelines. The limited potential for dust and odour emissions during the operation of the CIF can be controlled through effective containment and good management.

Odour impacts from the transport and handling of wastes can be effectively controlled by the use of closed containers at all times. On site, all wastes should be held in refrigerated storage areas where controlled ventilation can be used to prevent the release of odorous air.

## 4.3

*HUMAN HEALTH*

Long and short-term health risks were assessed against air quality standards based on either US Environmental Protection Agency (EPA) or UK Health and Safety Executive standards. An additional margin of safety was included to allow for the possible increased effects upon a residential population. For all aerial emissions, the maximum predicted concentrations were within their respective standards. Individual carcinogenic risk was assessed, based on US EPA guidelines, resulting in a worst case estimate of risk level at the nearest residence well within the established limit.

On the basis of the outline design, the distant location of the CIF is expected to ensure that noise generated during the operation of the plant will not exceed the Noise Control Ordinance (NCO), or planning criteria, at any NSRs. Similarly, traffic levels during the operational phase will be less than that of vehicles using the site at present. These predictions will be confirmed at the detailed design stage.

#### WATER QUALITY

The operation of the CIF is not expected to generate any effluent likely to exceed the established standards providing that sewage is adequately treated before discharge. Effluent streams, with an estimated total discharge of approximately 10 m<sup>3</sup> per day, will include container washing, hosedown water and drainage from process areas, surface runoff and sanitary sewage. If a wet gas scrubbing unit is used, it will require more treatment facilities for an estimated additional volume of 15 m<sup>3</sup> per day.

All CIF discharges are designed to be served by the proposed public sewerage network in Tuen Mun Area 38. However, the current schedule for the proposed public sewerage network may not be ready by the time that the CIF is in operation. An interim measure would be needed to further treat the effluents to the standards laid down in the TM prior to discharge. Alternatively, the effluent could be collected and tankered off to an existing sewage treatment works. The inclusion of appropriate drainage control measures in the detailed design will ensure that polluted effluent will not be discharged until after treatment. Wet scrubbers for flue gas cleansing are unlikely to be adopted in view of the high cost of operating and monitoring as compared with dry scrubbers.

#### LAND USE AND VISUAL IMPACTS

It was concluded in the Feasibility Report, that overall the CIF would not give rise to significant visual impacts providing the appearance of the facility is in keeping with the industrial nature of the area and that and stack emissions would not be visible. The external design of the plant and effective process controls will ensure these requirements are met.

#### WASTE MANAGEMENT

The CIF will have a storage capacity for 48 hours deliveries of clinical waste which will be sufficient to deal with anticipated plant stoppages. The backup capacity, combined with effective operational procedures, will minimise the need to divert clinical waste to landfill. Studies in the UK and US clearly show that the chemical composition of post-combustion waste is acceptable for disposal at landfill and the ash from the CIF is expected to be similarly disposed of at WENT landfill. The quantities of bottom ash and filter cake that will be produced by the CIF will have a negligible effect on the disposal capacity at the WENT Landfill. Some small quantities of high value waste such as aluminium and paper could be recycled.

## 5.1 CONCLUSIONS

### 5.1.1 *Air Quality*

Impacts from construction dust and operational emissions are not predicted to exceed the AQOs or other established criteria. However, due to the already high levels of dust in the area it is considered advisable to minimise the potential dust emissions from the site by good site management and housekeeping practices.

The aerial emission impacts from the stack are predicted to be within the established standards and guidelines with proper mitigation measures. An environmental monitoring and audit (EM&A) programme will be set up to ensure compliance with the established standards and guidelines in force at the time.

### 5.1.2 *Long Term Human Health Impacts*

The closure of the existing hospital incinerators and their replacement with a single purpose-built incinerator employing effective pollution control equipment will reduce the release of potentially harmful products into the atmosphere. The improved emission control system and the location of the CIF away from major centres of population, will ensure that potential health impacts from the operation of the CIF remain within established limits.

### 5.1.3 *Noise Impacts*

The CIF site is almost 2 km from the nearest sensitive receiver and this, coupled with the screening effect of intervening hills, will be sufficient to ensure that no exceedances of the established standards and guidelines are caused by the construction or operation of the CIF.

### 5.1.4 *Water Quality*

Construction impacts on water quality will be similar to those in an ordinary land-based site works. Proper site management and good construction practices would be implemented to minimise any discharges from the construction activities on site.

During operation, effluent discharge from the plant will be treated to the standards in the TM before discharge into the proposed sewers. The adoption of wet scrubbers for gas cleansing is unlikely in view of the high operational and monitoring cost. However, interim measures, such as on-site wastewater treatment plant, or tankering the effluent off-site to existing treatment works, might be required if the proposed foul sewer system is not ready.

### 5.1.5 *Traffic*

The construction and operation of the CIF are predicted to have little or no impact on the total traffic on local roads and will not, therefore, constitute a source of noticeable impacts when compared to the overall traffic loadings.

### 5.1.6 *Landuse and Visual Impacts*

The CIF site lies within the Tuen Mun Area 38 Special Industries Area. It is a planned component of the area and will not, therefore, be incompatible with other landuses. Under the proposed emission limits, the plant will not be permitted to generate either visible smoke or any other type of plume from the stack.

### 5.1.7 *Waste Management*

Construction wastes can be readily disposed of or used for fill on other sites. It may also be possible to recycle and recover construction materials for use elsewhere.

Currently, some 70% of clinical waste is disposed of directly to landfill, which is unacceptable to Government. The incineration of clinical waste will reduce the bulk by approximately 80% as well as rendering it sterile and visually inoffensive.

Effective disposal routes are available for all wastes which will be generated by the CIF. Post-combustion wastes are considered suitable for disposal to landfill and the quantities generated will not significantly affect landfill capacity in the territory.

### 5.1.8 *Ecology*

The CIF will be sited in the SIA, on newly reclaimed land. The suitability of the SIA for industrial uses was confirmed in the Expanded Development Study in 1990 and subsequently in the Reclamation and Servicing of Tuen Mun Area 38 for Special Industries EIA. The CIF EIA includes mitigation requirements based on the findings of the previous studies to ensure the acceptability of the SIA for the area. In view of the above, no adverse ecological impacts are predicted from the construction or operation of the CIF.

### 5.1.9 *Landfill Gas*

Potential risks from landfill gas migration from the SLSL are not considered sufficient to require specific protective measures to be employed. Precautionary measures to be carried out as part of the development of the SIA will be sufficient to deal with any gas generated by the landfill.

## 5.2 *RECOMMENDED TENDER REQUIREMENTS*

### 5.2.1 *Air Quality*

Good on-site management and construction practices to ensure dust suppression should be adopted during the construction of the CIF so that the established standards and guidelines are met.

To prevent off-site odour impacts, all clinical wastes are to be transported to the CIF in sealed containers and unloaded within the main incinerator buildings.

The water treatment plant and any other dusty areas should be enclosed and properly ventilated to ensure all exhaust air is either filtered or drawn through the incinerators before being emitted.

### 5.2.2 *Human Health*

Once the detailed design of the incinerator plant is complete it will be necessary to confirm that the concentrations of aerial emissions at sensitive receivers will be within the established limits.

### 5.2.3 *Noise*

A noise assessment should be undertaken at the detailed design stage to confirm the maximum noise levels during construction and operation of the CIF meet the requirements of the Hong Kong Planning and Standards Guidelines, Practice Notes for Professional Persons 2/92 and the NCO and to check the status of NSRs.

Internal noise should comply with the limits established in the Factories and Industrial Undertakings (Noise at Work) Regulation.

### 5.2.4 *Water Quality*

During construction of the CIF, the Contractor should employ proper site management to prevent debris and harmful materials from reaching water bodies, ensure that proper drainage facilities to control contaminated runoff are established and that sewage discharges are either connected to the local public sewer or chemical toilets provided.

The Contractor should ensure that a detailed design stage assessment will be undertaken when information on effluent water quality is available to confirm that the effluent streams from the site will, after treatment, comply with the discharge standards.

### 5.2.5 *Traffic*

The Contractor should ensure that all vehicles comply with the relevant construction and use ordinances to prevent nuisance to the public from excessive noise or exhaust emissions.



### 5.2.6 *Landuse and Visual Impacts*

The external design of the CIF should meet the recommendations of the Expanded Development Study of Tuen Mun Area 38 Final Report. The heating system for stack gases should be variable to control plume visibility.

### 5.2.7 *Waste Management*

Waste materials should be segregated before disposal with recyclable materials separated from the waste stream. The requirements of the dumping licence, Waste Disposal Ordinance and other applicable regulations, licences and permits must be met.

The detailed design of the plant and operational procedures should ensure that the handling of all wastes is undertaken in a manner which protects the safety of operators and the public. All spillages should be contained and cleaned up immediately.

### 5.2.8 *Landfill Gas*

An appropriate specialist should be retained during the detailed design of the CIF and appropriate measures be developed to deal with any identified risk. The area of the CIF site inside the 250 m consultation zone should be monitored during construction.

## 5.3 *DETAILED ENVIRONMENTAL IMPACT ASSESSMENT*

Upon award of Contract, the Contractor will be required to undertake a Detailed Design Stage EIA to show that the construction and operation of the CIF will be managed in such a way that no impacts will exceed the established environmental standards and guidelines. If exceedances are identified, mitigation measures must be developed to deal with such events.

The Detailed EIA should determine that:

- the construction programme and procedures will be effective in controlling dust generation to the requirements of the AQOs;
- the design of the CIF and its operational procedures will effectively control fugitive dust and odour releases to within established limits;
- concentrations of aerial emissions at sensitive receivers will be within established limits and therefore not present an unacceptable health risk to the local population;
- the noise levels during the construction and operation of the CIF are within the limits of the NCO;
- wastewater treatment processes are included in the detailed design of the CIF to ensure that discharged water meets the discharge requirements;
- the external appearance of the CIF is appropriate for its location;
- that effective procedures are in place to deal with the routine movement, storage and disposal of waste and that emergency plans are in place to deal with accidental spillages; and

monitored landfill gas concentrations near the north-eastern site boundary during construction are within safety limits and liaise with EPD to establish the need for permanent protection schemes.

#### 5.4

##### *ENVIRONMENTAL MONITORING AND AUDIT*

The Contractor should employ an independent consultant to carry out the environmental monitoring and audit (EM&A). The data collected in the EM&A will be used to ensure that any accidental or other exceedances of the established environmental standards are promptly remedied.

The EIA has identified no need for EM&A during construction, however, due to the high dust levels in the area, it is recommended that monitoring is undertaken to ensure compliance with the established standards and guidelines.

Whilst not strictly part of EM&A, landfill gas monitoring is recommended for construction safety, the results should be reviewed before the facility becomes operational.

In the operational phase, stack gas and aqueous effluents will be monitored as part of the discharge licences rather than in the EM&A. The close proximity of several other sources may reduce the overall efficacy of the ambient air monitoring programme, however, it is recommended that ambient air quality be monitored during the operation of the CIF for a range of pollutants including particulates, acid gases, toxic and carcinogenic substances. Odour monitoring should be undertaken to ensure that there are no offensive odours beyond the site boundary.

#### 5.5

##### *OVERALL CONCLUSIONS*

The EIA has shown that, with the application of appropriate process control and other suitable mitigation methods, the CIF can be constructed and operated on the proposed site without generating any impacts which exceed either statutory requirements or other limits established during the assessment.

The successful Contractor will be required to undertake a Detailed Design Stage EIA which will assess the aspects identified in *Section 5.3*, based on the proposed design of the CIF. The tender documentation will specify the scope of the Detailed Design Stage EIA, identify EM&A requirements and detail the environmental standards and guidelines which must be observed.