2 PROJECT DESCRIPTION: THE POWER STATION

2.1 INTRODUCTION

The findings of the Stage 1 EIA indicated that the overall environmentally preferred combination from the fuel, technology and site options is a gas-fired power station employing combined cycled gas turbine technology, forming an extension to the existing Lamma Power station.

In this section the key elements of the new power station are presented; additional detailed information on the assumed construction methodology and operation specifications is presented in the technical chapters where such information has a bearing on the impacts under consideration.

2.2 RECLAMATION

The Lamma Extension site will be constructed entirely by reclamation in a depth of water of about 10 metres. The site platform will provide a usable area of about 22 hectares and will abut the south-west corner of the existing power station. A water channel will be retained to the north of the Lamma Extension to avoid blockage of cooling water intakes for the existing power station facilities. Dredging will be required to remove soft marine mud at the seawall and part of the reclamation area so as to provide an appropriate foundation stratum.

Significant issues for assessment include water quality impacts associated with dredging, reclamation and altered flow regimes, mud disposal, and impacts on fisheries and the marine environment.

2.3 COMBINED CYCLE PLANT

Six 300 MW gas-fired combined cycle units will be constructed on the Lamma Extension. Each unit will consist of gas turbines, heat recovery steam generators (HRSGs), a steam turbine, generators and a flue gas stack of about 110 m.

Gas from the receiving station will be combusted in the gas turbine, which in turn will drive a generator to produce electricity. The waste heat energy from the hot exhaust gases discharged from the gas turbine will be utilised by passing these gases through a HRSG to produce steam for driving a steam turbine for secondary electricity generation. The exhaust gas will then be discharged to the atmosphere through the stack. A once-through cooling water system will be adopted to condense steam exhaust from the steam turbine. Sea water will be extracted from the north side of the site and discharged at a higher temperature to the west side after passing through a condenser. The cooling water flow required for a 300 MW combined cycle unit is about 5.5 m^3 per second.

Key assessment issues for plant operation include direct and regional air quality impacts, greenhouse gas emissions, thermal impacts on surrounding marine waters, landscape and visual issues, waste management, and operational hazards. Local construction noise and dust impacts and operational noise should not be significant because of the substantial distance of the construction site from sensitive receivers.

2.4 *GAS RECEIVING STATION*

To receive natural gas delivered from a regional LNG terminal through a pipeline, a gas receiving station will be required. Received natural gas will be processed in the receiving station and subsequently delivered to the plant for combustion. Major components of the station include shut-off valves, pig receiver, filter, gas heaters, pressure regulator, metering device, stack and protection system to ensure safe operation.

The key issue in relation to gas handling and supply is the assessment of hazards to life.

Concerning air emissions from the flaring system, it has been considered that the possibility of flaring the continuous purge gas will be reviewed during the detailed design stage. Should continuous gas flaring be required, the purge flow would be approximately 5.27kg/hr. In view of the small rate of gas flow, it is expected that no significant air quality impact would result from continuous flaring, if required.

2.5 *LIGHT GAS OIL SYSTEM*

In line with restrictions imposed by the Environmental Protection Department on existing generating units at the Lamma Power Station, light gas oil with sulphur content no more than 0.5% and viscosity of not greater than 6 centistokes at 40°C will be used as an alternative fuel in cases of interruption of natural gas supply. A light gas oil supply system with a storage capacity of about 43,000 m^3 to cater for seven days of full oil-firing will be established.

The main assessment issues relate to potential pollution, land contamination and hazards associated with spills, leak, fires or other accidents in the storage and handling of the oil.

2.6 *ASSOCIATED FACILITIES*

The power station complex will also contain a variety of ancillary plant and buildings, including cooling water and wastewater treatment facilities, administration buildings, site roads and services, a switching station, and construction works and storage areas.