station, EMSD workshop, bus terminals, light industries, and ferry terminals. A site investigation (SI) was carried out in February 1997 to obtain and review the general baseline conditions for future development. The SI involved intrusive soil and ground water sampling from nine boreholes and ten trial pits inside the urban area in Kowloon City, Ma Tau Wai, Ma Tau Kok, and Hung Hom. It was concluded that the urban area as a whole did not have a major contamination problem but for specific hotspots with localised land contamination. It was recommended to carry out focused land contamination assessment for local potential industries / installations (such as oil filling stations, gas works and car repairing workshops), on a case by case basis where redevelopment is proposed. For the NAKTA area, reference was made to the NAKTA Decommissioning EIA. Regarding the Kai Tak Airport Runway, potential land contamination problem is not anticipated.

8.2.3 *NAKTA Decommissioning EIA*

8.2.3.1 The NAKTA Decommissioning EIA Report was completed in April 1998 and approved under the EIA Ordinance in September 1998. The reference of the approved report in the EIA Ordinance Register is AEIAR-002/1998.

8.2.3.2 The land contamination impact assessment of the NAKTA Decommissioning EIA covered the vicinity of the NAKTA area. The assessment was started with a review of the Kai Tak Airport site history including records of historical leakage from the hydrant fuel system within the airport apron. A range of land uses with land contamination potential was also identified.

8.2.3.3 A detailed site investigation within the Kai Tak Airport had been undertaken to ascertain the nature, scale and extent of possible ground contamination resulted from known leaks of aviation fuels. The investigation was carried in two phases. Phase 1 of the investigation characterised soil gas conditions in 195 boreholes to assess indirectly the likely subsurface soil contamination levels. The survey established the extent of the aviation fuel contamination and identified some "hotspots" coinciding approximately with the locations of historical leaks of aviation fuel and also with other sources. Elevated levels of methane and anaerobic conditions were founds in some areas. Phase 2 assessment included the installation of 77 groundwater wells and the collection of soil and groundwater samples for chemical analysis to confirm the extent and nature of contamination so as to formulate feasible and site-specific remediation options.

8.2.3.4 Results from Phase 2 of the investigation indicated that remediation is required at some areas within the Kai Tak Airport. Decontamination works are now carrying out at the identified areas with Soil Vapour Extraction / Air Sparing system. Under the conditions of approval of the NAKTA Decommissioning EIA Report, the decontamination works shall be carried out such that the remediation targets are fully met.

8.3 Further Assessment

8.3.1 *Assessment Methodology*

8.3.1.1 As discussed in Section 8.2 above, the Assessment Area of the land contamination impact assessment for this EIA Study is completely covered in the previous SEKDFS EIA study. Area of major concern, namely the NAKTA area, was also examined in details in the NAKTA Decommissioning EIA Study and a remediation program is now carrying out at identified areas within NAKTA.

8.3.1.2 In accordance with Section 1.8 of the EIA Study Brief, best use may be made of relevant environmental findings in the previous studies conducted for the SEKD or any other previously approved EIA reports on the EIA Ordinance Register, provided that the findings of such studies can be shown to be still valid and applicable. The land contamination impact

assessment of this EIA Study was thus started with a review of the two EIA studies described in Section 8.2 above and then followed up with site visits and investigation.

8.3.2 *Areas within the Assessment Area*

8.3.2.1 For areas within the Assessment Area, change in situation with respect to land contamination is not anticipated after the closure of Kai Tak Airport. Findings of the land contamination impact assessments in the above two mentioned EIA studies are therefore considered still valid.

8.3.2.2 As referenced from the SEKDFS EIA report, two areas were identified as potential contaminated areas within the Assessment Area – the KTA North Apron and KTA Runway. For the runway, it was concluded that no significant contamination was expected. For the KTA North Apron, contamination was identified and decontamination was identified necessary. The details of the contamination assessment and decontamination requirement are presented in the NAKTA Decommissioning EIA Report (EIA Ordinance Register Reference AEIAR-002/1998).

8.3.2.3 It is noted that decontamination works are now being carried out at the identified remediation areas within NAKTA using Soil Vapour Extraction / Air Sparing system and excavation with biopile treatment in accordance with the NAKTA Decommissioning EIA Report.

8.3.2.4 Under the conditions of approval of the NAKTA Decommissioning EIA Report, the decontamination works shall be carried out such that the remediation targets are fully met. Besides, environmental monitoring and audit should be carried out in accordance with the respective Environmental Monitoring and Audit Manual. Provided that the decontamination works could be completed satisfactorily to meet the remediation targets, residual impacts on the remediated site due to land contamination is not expected.

8.3.2.5 However, there are sites within the Assessment Area which are not included in the NAKTA decommissioning project. Sites of potential land contamination include those chemical storage tanks (mainly fuel storage tanks) located within the disused Kai Tak Airport. **Drawing No. 22936/EN/296** shows the indicative locations of the storage tanks. It is recommended that when access to these sites is gained in future, land contamination assessment should be conducted taking into account all past and current land uses and site activities prior to the development of the sites.

8.3.2.6 Besides, it was found that the hangar operated by Government Flying Services (GFS) at the south apron might be a site of potential concern that was not reviewed in the previous studies. Further investigations were undertaken for this site and the details are presented in Section 8.4 below.

8.3.3 *Areas outside the Assessment Area*

8.3.3.1 For the urban areas outside Kai Tak Airport that were examined in the SEKDFS EIA study, although they are beyond the Assessment Area of this EIA Study, the findings are considered relevant.

8.3.3.2 **Table 8.1** is a summary of various contaminative landuses outside the assessment area extracted from the SEKDFS EIA report. A site investigation (SI) consisted of intrusive soil and groundwater sampling was conducted at selected locations. The soil and groundwater samples collected were tested for total petroleum hydrocarbon (TPH); polyaromatic hydrocarbons (PAH); metals including cadmium (Cd), chromium (Cr), nickel (Ni), lead (Pb), tin (Sn), zinc (Zn) & iron (Fe); mercury (Hg); total cyanide; total organic carbon (for soil only); salinity (for groundwater only); chemical oxygen demand (for groundwater only) and partial size distribution (for soil only). The results indicted that “the area as a whole did not

have a major contamination problem but for specific hot-spots localised heavy metal contamination was found. However, the extent of heavy metal contamination found in the SI is not expected to cause immediate environmental/health hazard. Elevated levels of TPH and heavy metals were observed in groundwater at some sampling locations. Immediate environmental / health hazard arising from groundwater contamination is not expected. Further land contamination assessment is recommended for local potential industries / installations (such as oil filling stations, gas works and car repair workshops) on a case-by-case basis where redevelopment is proposed".

8.3.3.3 The existing conditions within these urban areas had been reviewed as part of this EIA Study to confirm the validity of the previous findings. The reviewed findings are presented in Section 8.4 below.

Table 8.1 Summary of Information on Various Contaminative Landuses

Potentially Contaminative Uses	Information obtained from field observation and questionnaires	
	General Information	Possible/potential sources of contamination
Car Repair Workshops	• Size: typical 400 to 800 sq.ft; • Activities: car repair, maintenance, rarely some car washing; • Long history of operations at Ma Tau Wai (>5 years); and • Two large clusters found in Ma Tau Wai, others scattered over Kowloon City.	• Waste oils e.g. lubricating oils, transmission fluid and engine coolant; and • At present, waste oils collected by licensed chemical waste collector but previously such wastes were drained to nearby sewers or stormwater drains.
Petrol Stations	• Activities: refueling, storage of fuel, replacing motor oil and car washing.	• Underground fuel storage tank leakage (none recorded); • Accidental oil spillage (none recorded); and • Waste oils and car washing water contaminating drain (none recorded).
Ma Tau Kok Gas Works	• New site: N. Works size 12500 sq meters; • Old site: S. Works demolished 1993 company operation for 63 years; • Activities: town gas production, naphtha and diesel storage; and • Underground pipelines for fuel and gas transportation.	• Leakage from storage facilities; • Leakage from pipelines; and • For the old site, a land contamination study report was produced in 1993.
Bus Terminals	• No refueling, bus washing or fuel storage at bus terminals.	• Not likely to cause significant land contamination.
Ferry Terminals	• Passenger ferry pier at Kowloon City; • Size: 1744 sq.m with 39 years of operation; and • No refueling or fuel storage some ferry cleaning.	• Only application of lubricating oil, transmission fluids and paints (no disposal needed).
EMSD Workshop	• Activities: government vehicle repairing and maintenance (about 3000 veh per month); and • Long history of operation.	• A large underground waste oil tank was identified; and • Waste disposal and oil & fuel storage generally follows government environmental requirements at present.
Light Industries	• As they are mostly located at multi-storey industrial premises, land contamination is unlikely.	• Contamination may have arisen around the sewerage utilities serving these premises as a result of leakage.

8.4 Additional Site Investigations

8.4.1 *GFS Hangar*

8.4.1.1 As discussed in paragraph 8.3.2.6 above, additional investigation has been undertaken for the GFS Hangar site located at the south apron as part of this study (see **Drawing No. 22936/EN/297**). A site history review was undertaken to assess the potential of underground contamination caused by the hangar operation.