

construction dust suppression measures, and construction site drainage management, adverse environmental impacts arising from the construction of the RTS are not expected.

- 7.4.2.12 During operational phase of the RTS, the main activities of the RTS will be operated in an enclosed structure like other newly built RTSs in the territory. With the implementation of effective odour and noise control measures adopted in other RTS, adverse environmental impact is not expected. Besides, the proposed RTS is provided with marine access with a berthing length of about 200m. Comparing the environmental impacts associated with different modes of waste transfer namely conventional collection and disposal practices using small refuse collection vehicles; land transfer by container; and marine transfer by containers, marine transfer would entail the least environmental impacts. Marine transfer would also reduce the transfer of about 150 to 180 loads of 40 foot containerised refuse everyday comparing with an inland RTS site.
- 7.4.2.13 The proposed RTS is a Designated Project under Schedule 2 Part I:G.2 of the EIAO, a detailed EIA should be carried out by the future project proponent and approved under the EIAO to confirm that there will be no insurmountable environmental impacts associated with the construction and operation of the RTS.
- 7.4.2.14 Under the proposed implementation program of SEKD, the reclamation works for the RTS site in Area 6C will be completed in 2011. The site will then be handed over to EPD for commissioning of RTS in 2014.

7.5 Proposed RTS in SEKD

7.5.1 *Backgrounds*

- 7.5.1.1 Having reviewed the current operation and future needs, a new station shall be constructed at the waterfront to replace the existing refuse transfer station at Kowloon Bay.
- 7.5.1.2 In accordance with the requirement set out by the operating department, Environmental Protection Department, a new refuse transfer station with a minimum area of 2 ha is required, equipped with a berth to accommodate vessels with length 100m. Such a facility is similar to the refuse transfer station at West Kowloon Reclamation.

7.5.2 *Details of New RTS*

- 7.5.2.1 The proposed station will be located near the existing Kwun Tong Ferry Pier and close to the mouth of the Tsui Ping Nullah on a proposed reclamation area. The site will be rectangular in shape with an overall dimension of 200m long x 100m wide. To facilitate berthing for vessels up to 120m LOA, the vertical seawall 200m long with a minimum draft of 5m facing the breakwater of the proposed Kwun Tong Typhoon Shelter will be adopted.
- 7.5.2.2 The ingress and egress of the site is located at an access road from the Hoi Bun Road Extension. The proposed layout is shown on the **Drawing No. 22936/MS/205**.
- 7.5.2.3 The Refuse Transfer Station will generally be a covered or enclosed structure to mitigate possible environmental impact. Refuse will be transported into the station and tipped into a hopper, which will collect and compact the refuse before packing into containers for the disposal.
- 7.5.2.4 An open area will be provided at the seafront for the storage of filled / empty containers. Empty and filled containers will be stacked on the deck, either waiting for refuse packing or loading on to vessels for disposal. Lifting crane will be installed on the deck to stack containers as well as to handle containers between the deck and vessels.

7.5.2.5 The refuse transfer station building is a reinforced concrete structure with overall dimension 100m in length and 50m in width with two levels. The lower level will be the packing hall whilst the upper level will be the tipping hall. In order to optimise the limited space available, a single storey garage and maintenance workshop is being located at the middle of a spiral ramp which leading to the dumping hall. In addition to the waste transfer function, waste recovery/recycling activities may also be operated at the transfer station.

7.5.2.6 Weighbridges will be installed at ground level to record the weight of refuse handled at the transfer station. A vehicle wash will also be provided near the exit of the site to wash the vehicles before leaving the station. The station will also be equipped with transformer room, fuel tank and other fire services installations.

7.5.3 *Potential Environmental Impacts*

7.5.3.1 During the construction phase of the RTS, major environmental impacts would be associated with construction noise, dust, and site runoff. With the implementation of practicable and effective construction noise reduction measures (ref. Section 3.6.3), construction dust suppression measures (ref. Section 2.5.1), and construction site drainage management (ref. Section 4.5.1), adverse environmental impacts arising from the construction of the RTS are not expected.

7.5.3.2 The major features of the proposed RTS will include weighbridges, a transfer building, a wastewater treatment plant, container storage area, a vehicle wash, an administrative office and a maintenance workshop. The nearest air quality sensitive receiver is an existing industrial building located at about 100m to the northeast of the proposed RTS. The nearest residential use is Laguna City located at about 300m to the east of the proposed RTS. During the operation of the RTS, the major refuse handling activities will be undertaken within an enclosed structure. It is expected that with the implementation of effective odour removal system similar to those implemented in other RTS in the territory, odour impact at nearby sensitive receivers is not anticipated.

7.5.3.3 During operational phase of the proposed RTS, noise would arise from refuse handling activities which involves vehicle movements on site, refuse compaction, container handling and ventilation. Service equipment such as blowers/compressors in the wastewater treatment plant, electrical transformers and fire service pumping units are generally located inside designated equipment rooms and therefore is unlikely to generate noise impacts.

7.5.3.4 With reference to the assessment presented in Section 3.10.18 of this report, the operation of the proposed RTS is expected to generate noise level $L_{eq(30mins)}$ of 63 dB(A) at the nearest NSR at Laguna City. For daytime and evening operations, the calculated noise levels exceeded the EIAO-TM noise standard of 60 dB(A) at the nearest NSRs without any mitigation measure. Hence, it is recommended that the concerned parts of the RTS should be fully enclosed in order to reduce the noise impacts. Based on the current practice of other existing RTSs, no night time operation (i.e. 2300-0700 hours) is anticipated and therefore the nighttime criterion of 50 dB(A) is not relevant to the outcome of this assessment. The noise impacts arising from the movements of refuse collection vehicles outside the site of RTS have also been evaluated in Section 3.10.18.

7.5.3.5 The proposed RTS is provided with marine access with a berthing length of about 200m. Comparing the environmental impacts associated with different modes of waste transfer, namely the conventional collection and disposal practices using small refuse collection vehicles with road transfer by containers, against marine transfer by containers, marine transfer is the most favourable arrangement.

7.5.3.6 The proposed RTS is a Designated Project under Schedule 2 Part I:G.2 of the EIAO, a detailed EIA should be carried out by the future project proponent and approved under the EIAO to

confirm that there will be no insurmountable environmental impacts associated with the construction and operation of the RTS.

7.5.4 *Interaction between the New RTS and Existing KBTS /SENT Landfill*

7.5.4.1 The SEKD will fall within the current catchment area of the existing Kowloon Bay Transfer Station (KBTS). The KBTS was commissioned in April 1990 with a daily operational capacity of 1800 tpd. The current catchment of KBTS includes Kowloon City, Wong Tai Sin and Kwun Tong districts. The facility will reach the end of its serviceable life in 2010.

7.5.4.2 As at the end of year 2000, the estimated remaining void space of SENT was 29.4 million cubic metres. The consultancy study "Agreement No. CE 45/99 - Extension of Existing Landfills and Identification of Potential New Waste Disposal Sites" being undertaken by EPD indicates that the capacity of SENT Landfill would be exhausted between 2008 and 2010 for the different scenarios studied. Upon closure of SENT Landfill, some of the waste currently disposing of at SENT Landfill would need to be disposed of at the existing KBTS, or the new RTS.

7.5.5 *Justification of Waste Quantities and Design Capacity*

7.5.5.1 The waste disposal options for SEKD would depend on a number of factors. Factors to be considered include the amount of waste arising from the entire new development area of SEKD, the future waste management strategies, as well as the effectiveness of the Waste Reduction Framework Plan (WRFP) launched by the Government in November 1998. The waste reduction target upon completion of the intermediate phase of the WRFP in 2005 is 22% of the municipal solid waste requiring disposal. The target by the end of the final phase in 2007 is 40%. The corresponding reduction of waste to be transferred by refuse transfer stations in 2005 and 2007, compared with no implementation of waste reduction measures, would be 16% and 20% respectively.

7.5.5.2 Taking into account the factors discussed in Section 7.5.4 above, the projected waste generation of the future KBTS catchment including Kowloon City, Wong Tai Sin, Kwun Tong, SEKD and Sai Kung without considering waste reduction targets is presented in **Table 7.6**.

Table 7.6 Projected Municipal Solid Waste Quantities in tpd Without Considering Waste Reduction Targets

Catchment	District	2006			2011			2016		
		Domestic	C&I	Total	Domestic	C&I	Total	Domestic	C&I	Total
Future KBTS	Kowloon City	620	60	680	650	60	710	660	60	720
	Wong Tai Sin	500	30	530	520	40	560	550	40	590
	Kwun Tong	700	180	880	770	180	950	980	220	1200
	Sai Kung	---	---	---	560	190	750	610	200	810
	Old SEKD*	-158	-35	-193	-173	-35	-208	-360	-51	-411
	Current SEKD	102	10	112	126	12	138	370	42	412
					2009		2900			3321
Plus additional waste projection error of	10%			2210		3190			3653	
Capacity of KBTS				1800		1800			1800	
Surplus / deficit				-410		-1390			-1853	

Note: * Deduction of the projected municipal solid waste quantities generated from the SEKD population (mid-1999 TPEDM estimates for SEKD under Scenario II) included in EPD's *Monitoring of Solid Waste in Hong Kong 1999* report.

7.5.5.3 Two additional scenarios assuming 50% and 100% achievement of the waste reduction target were considered and the corresponding projected waste generation from the KBTS catchment is presented in **Tables 7.7 and 7.8** respectively.

Table 7.7 Projected Municipal Solid Waste Quantities in tpd Assuming 50% Achievement of Waste Reduction Targets

Catchment	District	2006			2011			2016		
		Domestic	C&I	Total	Domestic	C&I	Total	Domestic	C&I	Total
Future KBTS	Kowloon City	570	55	626	585	54	639	594	54	648
	Wong Tai Sin	460	28	488	468	36	504	495	36	531
	Kwun Tong	644	166	810	693	162	855	882	198	1080
	Sai Kung	---	---	---	504	171	675	549	180	729
	Old SEKD*	-145	-32	-178	-156	-32	-187	-324	-46	-370
	Current SEKD	94	9	103	113	11	124	333	38	371
					1848		2610			2989
Plus additional waste projection error of	10%			2033		2871			3288	
Capacity of KBTS				1800		1800			1800	
Surplus / deficit				-233		-1071			-1488	

Note: * Deduction of the projected municipal solid waste quantities generated from the SEKD population (mid-1999 TPEDM estimates for SEKD under Scenario II) included in EPD's *Monitoring of Solid Waste in Hong Kong 1999* report.

Table 7.8 Projected Municipal Solid Waste Quantities in tpd Assuming 100% Achievement of Waste Reduction Targets

Catchment	District	2006			2011			2016		
		Domestic	C&I	Total	Domestic	C&I	Total	Domestic	C&I	Total
Future KBTS	Kowloon City	521	50	571	520	48	568	528	48	576
	Wong Tai Sin	420	25	445	416	32	448	440	32	472
	Kwun Tong	588	51	739	616	144	760	784	176	960
	Sai Kung	---	---	---	448	152	600	488	160	648
	Old SEKD*	-133	-29	-162	-138	-28	-166	-288	-41	-329
	Current SEKD	86	8	94	101	10	110	296	34	330
					1688		2320			2657
Plus additional waste projection error of	10%			1856		2552			2922	
Capacity of KBTS				1800		1800			1800	
Surplus / deficit				-56		-752			-1122	

Note: * Deduction of the projected municipal solid waste quantities generated from the SEKD population (mid-1999 TPEDM estimates for SEKD under Scenario II) included in EPD's *Monitoring of Solid Waste in Hong Kong 1999* report.

7.5.5.4 As shown in **Table 7.8** above, even with 100% achievement of the waste reduction targets, the total municipal solid waste generated from the future KBTS catchment would exceed the maximum capacity of the existing KBTS from year 2006 onwards. The percentage contribution of SEKD is estimated to increase from about 5.6% in year 2006 to about 12.4% in year 2016.

7.5.5.5 Under the worst-case scenario as shown in **Table 7.6** without considering the waste reduction targets, the deficit in the capacity of the existing KBTS would increase from 410 tpd (or 23% of the existing KBTS capacity) in 2006 to 1853 tpd (or 103% of the existing KBTS capacity) in 2016. With further implementation of the RTS Charging Scheme in the future, the refuse

transfer stations including KBTS would be required to handle more privately collected municipal solid waste and the deficit in the capacity of the existing KBTS would increase accordingly.

7.5.5.6 In view of the waste quantities predicted above and the factors discussed in Section 7.5.4, the proposed RTS will handle the municipal solid waste generated from the catchment of the existing KBTS and the waste arising from Sai Kung district after closure of SENT landfill. According to the estimation presented in **Tables 7.6 to 7.8** above, the required capacity of the new RTS would be in the range of 3000 tpd to 3700 tpd in year 2016 depends on the degree of achievement of the waste reduction targets.

7.5.6 Traffic Impact

7.5.6.1 As noted from the operation of the RTS, it will handle a total capacity of 3000 tonne per day, a peak generation of 600 veh/day has been assumed in the traffic model and distributed onto the adjacent traffic network.

7.5.6.2 In order to handle the significant volume of traffic generation from the RTS and a Public Filling Barging Point (PFBP) located immediate next to it, the improvement scheme is as described following:

- (i) Hoi Bun Road should be widened and extended beyond Hoi Yuen Road to form a junction with Wing Yip Street.
- (ii) Reversion of How Ming Street from one-way westbound to one-way eastbound, and provision of a two-way connection to Hoi Yuen Road.
- (iii) Extension of Hoi Bun Road to Wing Yip Street to provide an access road to the future PFBP (with maximum trip generation scenario of 2400 veh/day) and Refuse Transfer Station (peak generation of 600 veh/day) located between Wing Yip Street and Hoi Yuen Road.

7.5.6.3 The additional traffic volume from the RTS and PFBP that distributed onto the adjacent junction has been assessed and the results indicated that they would operate satisfactorily in all design years. Hence, the result of the capacity assessment indicates that there should be no insurmountable traffic problem associated with the RTS and PFBP.

7.5.7 Implementation Programme

7.5.7.1 For the preliminary programme prepared at this stage, it is note that the new RTS site will not be formed until year 2009 and construction work could only be commenced after that. In view of the substantial civil, structural and E&M works required, it is expected that commissioning of the facility will be in around year 2012. It is important that the development programme of the RTS should tie in with the major framework of solid waster management to ensure un-interrupted service to the community.

7.6 Application of Automated Refuse Collection System (ARCS) in SEKD

7.6.1 Introduction

Background of the Study

7.6.1.1 This section outlines the potential application of ARCS in the South East Kowloon Development, mainly for the residential development in both public and private sectors. This section concentrates on the disposal of domestic waste from the residential development. The application to commercial area will be similar to the residential. However, there will be no