ISSUE 3

CONTAMINATION ASSESSMENT PLAN (FINAL)

Upgrading of Tai Po Sewage Treatment Works – Investigation

BV PROJECT NO. 40529.0000.55

PREPARED FOR

Drainage Services Department

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1 Introduction

1.1 Background

1.1.1 Drainage Services Department appointed Binnies Hong Kong Limited (Binnies or the consultants) to undertake the consultancy "Agreement No. CE 50/2019 (DS) Upgrading of Tai Po Sewage Treatment Works - Investigation" on 31 March 2020.

1.1.2 The existing Tai Po Sewage Treatment Works (TPSTW) is located within Tai Po Industrial Estate and has undergone various stages of extension since it was first commissioned in 1979. Currently, the existing TPSTW is a secondary treatment works with a design capacity of 120,000 m^3/day in average dry weather flow (ADWF) serving Tai Po Industrial Estate, Tai Po, Lam Tsuen and Ting Kok areas. The existing TPSTW layout is shown in **Annex 2.1A**.

1.1.3 The objective of the Project is to upgrade the existing TPSTW to about 160,000 m^3/day in ADWF, which is to be confirmed by the consultants, with a view to meeting the future needs of Tai Po District, and allowing provision to receive and digest sludge from the Sewage Treatment Works (STWs) in eastern New Territories (e.g. the relocated Sha Tin STW) for co-digestion with organic or pre-treated food waste.

1.1.4 Based on the flow record in 2018, the corresponding ADWF reached 115,000 m^3/day and is expected to reach the design capacity of the TPSTW in coming years. Taking into account the latest planning data, housing development programme, industrial flow and the potential centrate flow from co-digestion of imported sewage sludge and pre-treated food waste, the required design ADWF for the TPSTW may reach 160,000 m^3/day by 2041.

1.2 Project Description

1.2.1 The Project mainly comprises the following works:

- Construction and operation of new treatment facilities, modification / demolition of existing treatment facilities of TPSTW;
- Providing effluent reuse facilities; and
- Providing co-digestion facilities for imported sewage sludge and pre-treated food waste.

1.2.2 Owing to the space limitation within the existing TPSTW and in order to maintain the sewage treatment services of the existing TPSTW, which is almost fully utilized, a piece of government land to the south of the existing TPSTW (about 1.6 hectares) is identified as the proposed expansion site for the Project. The location plan of the Project is shown in **Figure 1.1**.

1.2.3 The Project consists of the following Designated Projects (DPs) under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):

- Item F.1 - Sewage treatment works with an installed capacity of more than 15,000 m^3 per day;
- Item F.4 - An activity for the reuse of treated sewage effluent from a treatment plant;
- Item D.1 – A public utility electricity power plant; and
- Item D.2 – A public utility gas generation plant.

1.2.4 The implementation of this Project requires an Environmental Permit (EP) from the Environmental Protection Department (EPD) under the EIAO. An application for an Environmental Impact Assessment (EIA) Study Brief (Application No. ESB-321/2019) for the

Project was submitted by DSD on 5 September 2019. An EIA Study Brief (No. ESB 321/2019) was subsequently issued by EPD on 16 October 2019 to facilitate the EIA study.

1.3 Purpose of this Report

1.3.1 According to Appendix I of the EIA Study Brief (ESB) No.: ESB-321/2019, a clear and detailed account of the present land use (including description of the activities, chemicals and hazardous substances handled, with clear indication of their storage and location, by reference to a site layout plan) and a complete past land uses history, in chronological order, in relation to possible land contamination (including accident records and change of land use(s) and the like) shall be provided for the Study Area of the proposed Project. If any contaminated land uses as stated in Sections 3.1 and 3.2 of Annex 19 of the Technical Memorandum on EIA Process (EIAO-TM), land contamination assessment shall be carried out.

1.3.2 This Contamination Assessment Plan (CAP) is prepared as part of the land contamination assessment for the Project in accordance with Section 3(i), Appendix I of the ESB No. ESB-321/2019. The purpose of this CAP is to provide information and guidance to characterize land contamination and identify where any contamination is or may be present in the Study Area. The objectives of this CAP are:

(a) To provide a clear and detailed account of the present land use and a complete past land uses history in relation to possible land contamination;

(b) To identify the potential land contamination site(s) within the Study Area of the Project; and

(c) To identify the chemicals of concern and scoping of requirements for sampling and laboratory testing of soil and groundwater sampling.

1.4 Study Area

1.4.1 The Project site is located at Tai Po Industrial Estate in East New Territories. The Study Area of this CAP covers the works area of the Project including the proposed upgrading works in existing TPSTW and the proposed expansion site as shown in **Figure 1.1**. The proposed excavation works limit of the Project is illustrated in **Figure 1.2**. The proposed upgrading works outside the excavation works limit involve only internal or indoor renovation within the existing buildings. The Study Area of this CAP is about 92,800 m^2. Should any excavation be proposed outside this excavation limit in the future, a land contamination assessment for the area concerned shall be conducted to identify the potential land contamination issues.

1.5 Statutory Legislation and Evaluation Criteria

1.5.1 This CAP is prepared in accordance with the following Technical Memorandum and Guidance Notes:

(a) Annex 19 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), Guidelines for Assessment of Impact on Sites of Cultural Heritage and Other Impacts (Section 3: Potential Contaminated Land Issues), EPD, 1997;

(b) Guidance Manual for Use of Risk-based Remediation Goals (RBRGs) for Contaminated Land Management (the Guidance Manual), EPD, 2007;

(c) Guidance Note for Contaminated Land Assessment and Remediation (the Guidance Note), EPD, 2007; and

(d) Practice Guide for Investigation and Remediation of Contaminated Land (the Practice Guide), EPD, 2011.

1.5.2 The Risk-based Remediation Goals (RBRGs) stipulated in the Guidance Manual will be adopted as the criteria for assessing any soil and groundwater contamination.

1.6 Structure of this Report

1.6.1 This report is structured as follows:

Section 1	gives an introduction of this CAP;
Section 2	presents the findings of site appraisal for the Study Area;
Section 3	summarizes the potential contaminated areas identified from site appraisal and requirements of site re-appraisal;
Section 4	presents the sampling and testing plan for Site Investigation (SI);
Section 5	evaluates the potential land contamination impact and identifies practical land remediation methods;
Section 6	discusses the way forward and recommends further works; and
Section 7	gives the conclusion of this CAP.

2 Site Appraisal

2.1 General

2.1.1 According to the Practice Guide, site appraisal shall precede to determine the need for site investigation, and to provide the information to support a contamination assessment, which the findings will subsequently determine if site remediation is required.

2.1.2 The site appraisal comprises site walkover, review of historical aerial photographs and maps, review of historical spillage and leakage records and review of previous intrusive site investigation (if any) undertaken at the Study Area.

2.1.3 The Study Area is located in Tai Po Industrial Estate (TPIE). TPIE is situated on a flat reclaimed land and is surrounded by gentle hills to the North and marine water to the South. The Study Area is bounded by industrial premises or factories to the North, South and West and Shuen Wan Restored Landfill (SWRL) to the East. Based on the latest engineering design, the proposed Project involves demolition of the facilities in the Study Area and soil excavation for the construction of the new plant.

2.1.4 The major facilities and areas within the Study Area are listed below and their locations are shown in **Annex 2.1A**.

Study Area in Existing TPSTW

- Inlet Pumping Station
- Screens House
- Detritors
- Primary Sedimentation Tanks
- Aeration Tanks
- Final Sedimentation Tanks
- Return Activated Sludge Pumping Station
- Sludge Digestion Tanks
- Sludge Consolidation Tanks
- Biogas Holding Tank
- Maintenance Building
- Administration Building
- Primary Sludge Gravity Thickener
- Chemical House
- Sludge Dewatering House
- Blower House
- Sludge Pumping Station
- Central Building Complex
- Extension of Sludge Dewatering House
- Filtrate Treatment Complex
- Filtrate Treatment Units
- Combined Heat and Power Generating System
- Ferric Chloride Dosing System
- Biogas Holding Tank Valve Chamber
- Waste Biogas Burner
- Old Administration Building
- Gas Transfer Station

- Decanting Chamber
- Dangerous Goods Store
- Waste Storage Area
- Car Park
- Lubricant Oil Store
- Electrical Workshop
- Control and Storage House
- Service Tower Building
- Effluent Pumping Station
- UV Disinfection Facilities
- Chemical Store
- Effluent Sampling Shelter
- Workshop

Study Area in Proposed Expansion Site (including Temporary Government Land Allocations (GLA) for Site Offices, Short-Term Tenancies (STT) for Recycling Industries and Vacant Land

- Lot No. STT 1449 – existing Canny Star Environmental Protection Limited
- Lot No. GLA-TPP 776 – existing DSD's and Contractor's Site Offices
- An existing vacant land (previously used as CEDD's and Contractor's Site Offices)
- Lot No. STT 1450 – existing C & H Import and Export Co.
- Lot No. STT 1745 – existing Lau Choi Kee Plastic Company Limited

2.2 Review of Historical Land Uses

2.2.1 According to DSD's information, the TPSTW comprises two independent plants, which are Stage I/II (West Plant) commissioned in 1979/1983 and Stage IV (East Plant) commissioned in 1996. There is no TPSTW Stage III. In order to cope with the rapid development in the district and more stringent effluent discharge standards, the Stage V Phase 1 and Phase 2 was completed by 2010 and 2013.

2.2.2 A review of aerial photographs has been taken to evaluate the likelihood of potential contamination associated with past land uses within the Study Area. The development history of the Study Area and the list of aerial photographs reviewed is summarized in **Table 2.1** below. The Short-Term Tenancy (STT) records of the Lands Department have also been reviewed to facilitate the identification of occupants observed in the proposed expansion site from the historic aerial photos. The selected aerial photographs are provided in **Annex 2.1.**

Table 2.1 Aerial Photographs Reviewed

Year	Page No. in Annex 2.1	Site Description
1945	Annex 2.1-Page 3	Project Site ■ The location of the Project Site, including the existing Tai Po Sewage Treatment Works (TPSTW) and the proposed expansion site, was the sea. Surrounding Off-site Areas ■ The surrounding off-site areas, including the present Tai Po Industrial Estate (TPIE) and the Shuen Wan Restored Landfill (SWRL), were still the sea. No reclamation is found.
1973	Annex 2.1-Page 4	Project Site ■ The land within the Project site was not yet formed.

Year	Page No. in Annex 2.1	Site Description
		▪ No reclamation is found. <u>Surrounding Off-site Areas</u> ▪ The areas immediately around the Project site were also the sea.
1982	Annex 2.1-Page 5	<u>Project Site</u> ▪ Land formation / reclamation in the Project Site was completed. ▪ TPSTW Stage I was in operation. ▪ Construction of TPSTW Stage II was in progress. ▪ A small amount of construction equipment / facilities is observed in the southern area of the Project site. ▪ The remaining areas of the Project site were vacant lands. <u>Surrounding Off-site Areas</u> ▪ Most of the reclaimed lands within the existing TPIE site were formed. ▪ Area to the east of the Project site (within the boundary of the present Shuen Wan Restored Landfill (SWRL) site) was still the sea. Shuen Wan Landfill (SWL) should be in operation in the north, further away from the Project site. ▪ Buildings and infrastructure in the northern TPIE were formed. ▪ The southern area of the existing TPIE site were mainly roads and vacant lands or still under reclamation.
1993	Annex 2.1-Page 6	<u>Project Site</u> ▪ TPSTW Stage I and Stage II (West Plant of TPSTW) were in operation. ▪ TPSTW Stage IV (covering most of the remaining areas of the present TPSTW site) was under construction. ▪ A DSD's office was being formed in the middle of the proposed expansion site (in Lot No. GLA-TPP 776). ▪ The remaining areas of the proposed expansion site were not yet occupied and mostly vegetated. <u>Surrounding Off-site Areas</u> ▪ SWL (to the east of the Project site) was under full operation. ▪ Reclamation for TPIE was fully completed. ▪ Industrial buildings were developed around the Project site. ▪ Some construction activities were taking place in the southern TPIE near the waterfront.
1996	Annex 2.1-Page 7	<u>Project Site</u> ▪ TPSTW Stage IV was completed and in operation. ▪ Four more Final Sedimentation Tanks in the east part of TPSTW were built. ▪ The DSD's office (in Lot No. GLA-TPP 776) within the proposed expansion site was in operation.

Year	Page No. in Annex 2.1	Site Description
		▪ A CEDD's office was being formed in the existing vacant land (next to the DSD's office) in the proposed expansion site. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ The construction works previously observed near the waterfront were completed. ▪ A new building was formed in the southern TPIE near the waterfront (in Lot No. GLA-TP 275) ▪ Some vegetation in the southern TPIE (in Lot No. TPTL 13 S.G) was removed. ▪ SWL Leachate Pre-treatment Works (LPW) and Landfill Gas Treatment Plant were built to the north of the TPSTW. ▪ SWL (to the east of the Project site) was closed and under restoration ▪ No obvious changes for other off-site areas.
2000	Annex 2.1-Page 8	<u>Project Site</u> ▪ A recycling workshop was being formed in the west part of the proposed expansion site (in Lot STT 1449). ▪ The CEDD's office in the proposed expansion site (in the existing vacant land) was in operation. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ The SWRL started to serve as a 145-bay golf driving range for public use. ▪ The area (in Lot No. TPTL 13 S.G) in the southern TPIE (previously observed to have exposed soil) was vegetated again. ▪ No obvious changes for other off-site areas.
2003	Annex 2.1-Page 9	<u>Project Site</u> ▪ According to the Short Term Tenancy (STT) record of Lands Department, Jets Technics Limited (a business in connection with the recovery and recycling of waste materials found in municipal solid waste) was in operation in the west part of the proposed expansion site (Lot No. STT 1449) since 2003. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ Lot No. TPTL 13 near the waterfront of TPIE was under construction. ▪ New buildings were formed in Lot No TPTL 13 S.E in the southern TPIE. ▪ No obvious changes for other off-site areas.
2005	Annex 2.1-Page 10	<u>Project Site</u> ▪ Some modification works of the central part and eastern side of the TPSTW were observed.

Year	Page No. in Annex 2.1	Site Description
		▪ More shelters were built in the area of Jets Technics Limited in west part of the proposed expansion site (in Lot No. STT 1449). ▪ Temporary structures were found in the eastern lots of the proposed expansion site (in Lot No. STT 1450 and 1745). Lands Department has no record of STT at these lots. Occupant information is unknown. Recycling industries were likely operated in these lots. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ New buildings were formed in the southern TPIE (in Lot No. TPTL 13 S.E, Lot No. TPTL 13 S.G, Lot No. GLA TP-275 and Lot No. TPTL 13). ▪ More plantation was observed Lot No. TPTL 13 (in the southern TPIE) and in the SWRL. ▪ No obvious changes for other off-site areas.
2006	Annex 2.1-Page 11	<u>Project Site</u> ▪ Construction of TPSTW Stage V was in progress. ▪ One of the shelters of Jets Technics Limited in the proposed expansion site (Lot No. STT 1449) was demolished. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ Dense plantation is observed in the SWRL. ▪ No obvious changes in the other off-site area.
2007	Annex 2.1-Page 12	<u>Project Site</u> ▪ Construction of TPSTW Stage V was in progress. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ No obvious changes for all surrounding off-site areas
2009	Annex 2.1-Page 13	<u>Project Site</u> ▪ Construction of TPSTW Stage V continued. ▪ According to the STT record of Lands Department, Canny Star Environmental Protection Limited was in operation in the west part of the proposed expansion site (Lot No. STT 1449) since 2009 (replacing Jets Technics Limited). Canny Star Environmental Protection Limited was a business in the recovery and recycling of metals, paper, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood or furniture or any combination of the above found in municipal solid waste. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ No obvious changes for all surrounding off-site areas.
2011	Annex 2.1-Page 14	<u>Project Site</u> ▪ Phase 1 of TPSTW Stage V was completed and in operation. ▪ Construction of TPSTW Stage V (Phase 2) continued. ▪ No obvious changes for other Project areas.

Year	Page No. in Annex 2.1	Site Description
		Surrounding Off-site Areas ▪ No obvious changes for all surrounding off-site areas.
2012	Annex 2.1-Page 15	Project Site ▪ Construction of TPSTW Stage V (Phase 2) continued. ▪ A shelter was built in the site of Canny Star Environmental Protection Limited in the west part of the proposed expansion site (Lot No. STT 1449). ▪ C & H Import and Export Co. was in operation in the east part of the proposed expansion site (in Lot No. STT 1450). It was a steel recycling workshop and steel warehouse for storage of waste steel. ▪ No obvious changes for other Project areas. Surrounding Off-site Areas ▪ No obvious changes for all surrounding off-site areas.
2014	Annex 2.1-Page 16	Project Site ▪ TPSTW Stage V was completed and in operation. ▪ Construction of some Final Sedimentation Tanks is observed in the east part of TPSTW. ▪ According to the STT record of Lands Department, Fook Woo Waste Paper Company Limited was the tenant in the eastern lot of the proposed expansion site (in Lot No. STT 1745) since 2013. It was a business in the recovery and recycling or reprocessing of metals, papers, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood and furniture, organic waste (excluding chemical waste) or any combination of the above materials found in and recovered from municipal solid waste. ▪ No obvious changes for other Project areas. Surrounding Off-site Areas ▪ No obvious changes for all surrounding off-site areas.
2015	Annex 2.1-Page 17	Project Site ▪ Construction of the Final Sedimentation Tanks previously observed in the east part of TPSTW was completed. ▪ Some shelters in C & H Import and Export Co. and Fook Woo Waste Paper Company Limited in the eastern lots of the proposed expansion site (Lot No. STT 1450 and 1745) were demolished. ▪ No obvious changes for other Project areas. Surrounding Off-site Areas ▪ No obvious changes for all surrounding off-site areas.
2016	Annex 2.1-Page 18	▪ No obvious changes for the Project site and surrounding off-site area
2018	Annex 2.1-Page 19	Project Site ▪ According to the STT record of Lands Department, Lau Choi Kee Plastic Company Limited was the tenant in the eastern lot of the proposed expansion site (Lot No. STT 1745) since 2017 (replacing Fook Woo Waste Paper Company Limited). It was a business in recovery and

Year	Page No. in Annex 2.1	Site Description
		recycling or in connection with reprocessing of plastics found in and recovered from municipal solid waste. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ No obvious changes for all surrounding off-site areas.
2020	Annex 2.1-Page 20	<u>Project Site</u> ▪ Shelters were built in the eastern lot (Lau Choi Kee Plastic Company Limited) in the proposed expansion site (Lot No. STT 1745). ▪ The CEDD's office previously observed in the middle of the proposed expansion site (next to the DSD's offfice) was removed and the lot became vacant. ▪ No obvious changes for other Project areas. <u>Surrounding Off-site Areas</u> ▪ No obvious changes for all surrounding off-site areas.

<u>Project Site</u>

2.2.3 The Study Area (including the existing TPSTW site and the proposed expansion site) was part of the Tolo Harbour (i.e. the sea) in or before early 1970s. Subsequently, land reclamation was progressively carried out in the Study Area. The sites in the Study Area were formed via land reclamation during the 1970s. The TPSTW was then built on the reclaimed land and the first stage of TPSTW was commissioned in 1979. The Study Area within the existing TPSTW site boundary has been solely used as sewage treatment works since the reclaimed land was formed. No other past land use was identified within the site. Some chemicals (e.g. lubricating oil) would be used and stored in TPSTW.

2.2.4 The proposed expansion site is within the government land. Currently, the expansion site comprises 3 Short Term Tenancy (STT) lots, 1 temporary Government Land Allocation (GLA) lot and an existing vacant land. The STT lots have been occupied by a number of existing and past waste recycling industries involving paper, glass, plastics, tyres, electronics and scrap metals recycling works. Besides the waste recycling industries, no other past land use was identified in the STT lots since the sites were formed. The waste recycling processes in the STT lots may include handling of oil, metals and petrol from trucks and machineries etc. On the other hand, the GLA lot and the existing vacant land have been solely used as government's and contractor's offices since the sites were formed. No maintenance activities nor storage of fuel and chemicals has been carried out at the GLA lot and the existing vacant land based on available record such as the information acquired from government departments (Section 2.4) and the result of site reconnaissance (Section 2.5). Existing and past land uses in the GLA lot and the existing vacant land mainly involve daily office works, which are not potentially contaminating activities.

2.2.5 Based on the desktop review of aerial photographs and land uses, historical potentially contaminating activities in the Study Area may include the operation of TPSTW and the recycling industries in the STT areas of the proposed expansion site.

<u>Surrounding Off-site Areas</u>

2.2.6 Past land uses in the surrounding areas include only the TPIE and Shuen Wan Landfill (SWL). The SWL was closed in 1995. Subsequent to the closure of the landfill site, restoration works were implemented and the closed landfill started to serve as a 145-bay golf driving range for public use in 1999. Industrial operations in TPIE have been controlled and confined within

concrete buildings and protected with concrete floor slab. The SWL is provided with leachate management and lining system.

2.2.7 TPSTW Stage V works involve construction of new facilities in available space within TPSTW and modification of some existing facilities. Excavation was proposed in some open spaces of TPSTW (not occupied by any existing facilities) for construction of new treatment units. According to Section 5.4.4 of the approved EIA Report for "TPSTW Stage V" published in 2004 (EIAO Register No.: AEIAR-081/2004), land contamination assessment was carried out in TPSTW, and the assessment showed that there was no exceedance in the Dutch B levels (i.e. soil clean-up targets) for all soil samples in the excavation works areas of TPSTW Stage V, which concluded that the area was not contaminated [1]. Thus, widespread of land contamination influencing from the surrounding off-site facilities (i.e. TPIE and SWL) is not anticipated. The surrounding areas including the TPIE and SWRL will not be affected by this Project and will remain intact during construction and operational phase. No land contamination issue associated with the Project works is expected.

2.3 Site Geology and Hydrogeology

2.3.1 The proposed excavation works limit of the Project is shown in **Figure 1.2**. The Study Area within the proposed excavation works limit was originally part of the Tolo Harbour and was formed through land reclamation. The geological profile of Study Area generally comprises a fill layer over-lying a layer of marine deposit or alluvium. The public fill was previously placed on top of the marine deposits during the 1970s as a result of the land reclamation activities.

2.3.2 Under the Ground Investigation (GI) works of this Project, vertical geological profiles were recorded in ten (10) boreholes within or close to the upgrading works boundary of the Project. The thickness of the general fill material ranged from 14.5m to 19.85m in all the ten boreholes.

2.3.3 The relevant past GI records from Geotechnical Information Infrastructure (GInfo) of Civil Engineering and Development Department (CEDD) and other previous investigations were also reviewed. These past GI data indicated that the thickness of the general fill material ranged from 4m to 20m. Most of these GI data indicated the thickness of the fill material in the proposed upgrading works area was > 10m. Thinner layer of fill material of < 10m was only recorded in localized areas.

2.3.4 Underneath the fill is marine deposits with thickness up to about 12.3m or alluvium with thickness up to about 14m. Rocks of various degrees of decomposition present below the marine deposit layer or alluvium layer or immediately underneath the fill layer. Within the proposed upgrading works area of this Project, bedrock is encountered at a depth ranging from about -30.81 mPD to -61.54 mPD as compared to the ground surface of about +6 mPD.

2.3.5 Groundwater monitoring was carried out in selected boreholes within the Project site and the surrounding areas in TPIE. The highest groundwater levels recorded over the monitoring period ranged between +6.20 mPD (in a borehole to the north of the Project site) and +2.68 mPD (in a borehole to the south of the Project site). Natural hillside to the north of TPIE would

[1] Details of the land contamination site investigation results are not reported in the EIA and not available from DSD.

be the key groundwater source in TPIE (including the Project site). Rainwater infiltrates into the ground of the hillside would continue downward until it reaches the impermeable bottom (bedrock). The highest absolute ground level is expected to occur in the aquifers uphill to the north of TPIE. Water in the saturated aquifers would flow down gradient from uphill towards the areas of lower hydraulic head in TPIE and eventually drain into the marine water. Thus, the generalized groundwater flow direction would be from the north to the south. The relevant GI records are presented in **Annex 2.7**.

2.4 Acquisition of Information from Government Departments

2.4.1 The Environmental Protection Department (EPD) and Fire Services Department (FSD) have been contacted for (i) records for any spillage / leakage of chemicals and chemical waste, (ii) records of Dangerous Goods (DG), (iii) records of Chemical Waste Producer(s) (CWP) and (iv) records of reported fire incidents within the Study Area of TPSTW. EPD and FSD's replies on the request have been received and attached in **Annex 2.2**. The information is summarized below.

Environmental Protection Department

2.4.2 Based on the replies given by EPD on 6 October 2020, EPD has no record of chemical spillage /leakage incidents within the Study Area in the past five years. Visit to EPD's Territorial Control Office was also undertaken on 24 September 2020 to review the available registry of CWP records. Three CWP records were identified within the TPSTW site.

2.4.3 Details of the record within the TPSTW are summarized in **Table 2.2**. According to the information provided by site representative from DSD, services provided by The Jardine Engineering Corporation Ltd is no longer in use.

Table 2.2 Summary of CWPs within the Project Area

CWPs	Business Type	Address	De-registered
Director of Drainage Services	Sewage Treatment	Tai Po Sewage Treatment Works, 7 Dai Kwai Street, Tai Po Industrial Estate, Tai Po, NT	**No**
The Jardine Engineering Corporation Ltd	Eng'g Contractors and Eng Merts	Tai Po Sewage Treatment Works, Tai Po, NT	**No**
China Harbour Engineering Co. (Group)	Construction of Tai Po Sewage Treatment Works Stage V Phase 1	7 Dai Kwai Street, Tai Po Industrial Estate Tai Po, NT	**No**

Fire Service Department

2.4.4 Based on the reply from FSD on 11 November,2020, no records of fire incidents or incidents of spillage /leakage of DGs were found within the Study Area.

2.4.5 According to the memo issued by FSD on 11 November,2020, from the year of 1990 to present moment, DG licenses have been issued by FSD to TPSTW. FSD has approved the existing DG Store being put in use for the storage of the following DGs. The FSD memo is provided in **Annex 2.2.**

- Cat.7 : 10,000 litres
- Cat.3 : 2,400 litres
- Cat.3 : 13,500 litres
- Cat.3 : 2,400 litres
- Cat.3 : 24,000 litres
- Cat.4 : 1,000 litres
- Cat.4 :1,000 litres

2.4.6 According to the findings of site inspections and reply from the DSD's site representative, all the above DGs (mentioned in Section 2.4.5) are not used nor stored in TPSTW. In fact, the following DGs or chemicals of concern are stored within the Study Area.

- Cat.5 (Thinners): design storage capacity – 1,080 litres / actual storage quantity – 600 litres at the DG Store of TPSTW Stage I and Stage II (West Plant)
- Lubricant oil (non-DG) – over 60 drums of lubricant oil (209 litres per drum) at the DG Store of TPSTW Stage I and Stage II (West Plant) and about 6 bucket of lubricant oil (18 litres per bucket) stored inside the cabinet at the Maintenance Building of TPSTW Stage I and Stage II (West Plant)
- Paint (non-DG) – about 10 cans (3.78 litres per can) at the DG Store of TPSTW Stage I and Stage II (West Plant) and about 12 cans of Paint (10 cans of 3.78 litres per can, 1 can of 20 litres and 1 can of 2 litres) stored inside the cabinet at the Maintenance Building of TPSTW Stage I and Stage II (West Plant)
- Cutting oil (non-DG) – 1 bucket (18 litres) stored inside the cabinet at the Maintenance Building of TPSTW Stage I and Stage II (West Plant)
- Cat. 5 (Diesel oil): for emergency generators – one 450-litre diesel oil tank at the Screen House of TPSTW Stage IV (East Plant) and two 24,600-litre diesel oil tanks (total 49,200 litres) at the Waste Biogas Burner of TPSTW Stage IV (East Plant)
- Cat. 3: (Caustic Soda) – about 14 drums (25 litres per drum) at the Chemical Store of TPSTW Stage IV (East Plant)

2.4.7 The information provided in Section 2.4.5 is based on the past DG licensing records of FSD. The information presented in Section 2.4.6 represents the actual and current DG storage conditions in TPSTW. Although the storage of DGs (Categories 3, 4 and 7) is permitted according to the records of FSD, not all these DGs are used nor stored in TPSTW. Based on the consultation with DSD, the design and actual storage capacities of DGs (Category 5) currently used in TPSTW are less than the statutory exempted quantities. Therefore, no licensing of DGs (Category 5) was recorded by FSD.

2.5 Site Reconnaissance

2.5.1 Site walkovers were conducted between October 2020 and August 2021 to investigate any contaminative issue associated with current land uses and activities within the Study Area and the surrounding area. Questionnaire was conducted with available site representatives and the site walkover checklist is provided in **Annex 2.3**. Site appraisal findings of the major facilities and areas within the Study Area listed in Section 2.1.4, including the necessity for site investigation (SI) works, are detailed in **Table 2.3a** to **Table 2.3c** below. The photographic records are shown in **Annex 2.4**. Site observations of the off-site surrounding areas are presented in Sections 2.5.22 and 2.5.23.

Study Area in Existing TPSTW

2.5.2 As observed during the site walkover and in the aerial photographs, approximately 37% of the Study Area in TPSTW is covered by facilities and buildings whereas the remaining areas are

covered by access roads and vegetation. No land contamination issues were identified in the remaining areas (i.e. access roads and vegetation). Except for the landscaped areas, all facilities, buildings and access roads were paved with intact concrete in good condition and no stressed vegetation were observed during the site walkover.

2.5.3 Based on the site condition and nature of sewage treatment operations, widespread contamination is not envisaged across the Study Area. The potential land contamination issues are therefore likely to restricted within the facilities that handle hazardous substance / chemicals.

2.5.4 Based on site observations and information provided by EPD, FSD and DSD (refer to **Section 2.4** for details), the following DGs and chemicals were being handled and stored in TPSTW:

- **Thinners and paints** (are stored in the DG Store and Maintenance Building located within the Study Area)
- **Lubricating oil** (including soluble cutting oil, hydraulic oil, lubricant oil and gear oil) is not classified as DG and is stored in the DG Store, Maintenance Building and Lubricant Oil Store located within the Study Area)
- **Ferric chloride** (is stored at various locations of TPSTW in Ferric Chloride Dosing System#1 and #2, Sludge Dewatering House and Chemical House)
- **Fuel (diesel oil)** (is stored at Screen House within a 450-litre tank and in the area of Waste Biogas Burner within two 24,600-litre tanks)
- **Caustic Soda** (is stored in the Chemical Store)
- Spent chemical tanks and chemical wastes are stored in Lubricant Oil Store, Maintenance Building and Chemical Store

2.5.5 The fuel (diesel oil) tank and the tank storage area (at Screen House) for the emergency generators were in good condition with no stain or leakage observed. The fuel storage area looked clean as shown in Photo EP-39 of **Annex 2.4**. The facilities are protected by concrete building and concrete floor slab. No land contamination issue associated with the fuel storage is identified.

2.5.6 The two fuel (diesel oil) tanks (at Waste Bio-gas Burner) were in good condition with no stain or leakage observed. The fuel storage area is protected within bunded area and on concrete slab as shown in Photo EP-29 of **Annex 2.4**. No soil contamination issue is identified in this area.

2.5.7 Ferric chloride solutions are commonly used as flocculants and coagulants in sewage treatment. Ferric chloride stain was observed at the Ferric Chloride Dosing System #1 and #2 (Photos WPS-27, EP10 and EP-13 of **Annex 2.4**). Ferric chloride storage areas in other location (i.e. Chemical House) were in good condition, no stain or leakage is found (Photo WPS-17 of **Annex 2.4**). Ferric chloride is not considered as a Chemical of Concern (COC) and would not induce land contamination impact.

2.5.8 The DG Store provides storage for some DGs and chemicals (e.g. thinners, paints and lubricating oil). The DG Store is a concrete building within the excavation works limit / Study Area. The concrete building of the DG store is fully enclosing and covering the DGs and chemicals (Photo WP-22 of **Annex 2.4**). During the observations, thinners and paints are well stored inside the DG store on racks and concrete paved slab, no leakage or stain are observed (Photos WP-23 and WP-24 of **Annex 2.4**). The areas inside and outside the DG Store appeared to be clean and tidy with no sign of land contamination.

2.5.9 Chemical storage is identified in Maintenance Building. These chemicals are stored inside the cabinets and the cabinets are enclosed within a concrete building and protected by concrete floor slab (Photos WP-11, WP-11a and WP-11b of **Annex 2.4**). As such, no soil contamination issue is identified at the Maintenance Building.

2.5.10 The Lubricant Oil Store includes a Lubricant Oil Storage Room and a Gear Oil Station. The Lubricant Oil Storage Room is a concrete building enclosing the lubricant oils. Oil leakage and spills were found inside the Lubricant Oil Storage Room. The Gear Oil Station comprises an open storage area. Spent oil tanks, chemical waste and oil stains were identified in the open storage area of the Gear Oil Station (Photo EP-22a of **Annex 2.4**). As oil stain was observed on the floor at the areas both outside and inside the Lubricant Oil Store (refer to **Annex 2.4**, Photos EP-22 to EP-24), the Lubricant Oil Store is considered a potential land contamination hotspot.

2.5.11 Spent chemicals or chemical waste are stored in the Chemical Store. All chemical wastes are properly stored and contained (Photos EP-41 to 43 of **Annex 2.4**). Caustic soda (stored in the Chemical Store) is not a COC and would not induce any soil contamination issue. The chemical Store looked clean and tidy with no historic spillage recorded. The chemicals are enclosed within concrete buildings and protected by concrete floor slab. No land contamination issue associated with the Chemical Store is identified.

2.5.12 Small amount of chemicals (e.g. thinners and lubricating oil) are used in operation of several sewage treatment facilities in Study Area (e.g. pumps). All the treatment facilities (using chemicals) in the Study Area are operated above the concrete floor slab as well as fully covered and enclosed inside concrete buildings. No sign of land contamination (e.g. oil stains) were observed inside and outside these facilities. Conditions of these facilities are shown in Photos WP-25 to 28 and EP-18 (Inlet Pumping Stations), WPS-1 to 2 (Return Activated Sludge Pumping Stations), WPS-3 to 5 (Sludge Pumping House), WPS15, 16, 20 and 21 (Sludge Dewatering House), WPS-22 to 24 (Extension of Sludge House) and WPS-30 to 34 (Effluent Pumping Station) in **Annex 2.4**. In addition, as reported by DSD's site representatives, there have been no records of chemical spillage / leakage incidents in these sewage treatment facilities.

2.5.13 Transformer is identified next to the Blower House on concrete paved surface surrounded by vegetation (Photo WPS-35 of **Annex 2.4**). No enclosure or cover was provided to the transformer for the whole operation period of the TPSTW. Cracks are observed near the transformer. However, the transformer is maintained in good condition and no leakage of transformer oil is recorded or observed. Emergency generators are found inside the Screen House of East Plant on concrete paved floor (Photo EP-40 of **Annex 2.4**). No sign of land contamination (e.g. oil stain and stressed plant) is identified at these facilities and the surrounding ground surfaces.

2.5.14 In summary, the Study Area in TPSTW site is generally orderly and well managed. Only 1 potential land contamination hotspot was identified in within the Study Area in the TPSTW (namely the Lubricant Oil Store). Area of the Lubricant Oil Store is illustrated in **Annex 2.4C**.

Proposed Expansion Site

2.5.15 The C & H Import and Export Co. (Lot No. STT 1450) and Lau Choi Kee Plastic Company Limited (Lot No. STT 1745) are the two STT Lots in the proposed expansion site where site access is permitted and allowed.

2.5.16 The site of C & H Import and Export Co. generally looked untidy and dirty (Photos EA11 to 23 of **Annex 2.4**). Stockpiles of metal wastes, metal scrap and equipment were found lying around the site area. A number of large machineries were operated on-site. Engine oils were not properly stored with no bund wall and no secondary containment. Some engine oil tanks were found in open area with no shelter. The recycling activities are expected to be operated on the concrete floor slab. Cracks were observed on the floor as vegetation were observed along the boundary of the site area (Photo 23 of **Annex 2.4**).. However, as most of the floor surfaces were covered with stockpiles, machineries, equipment, dirt and debris during the site walkover, it is recommended that the condition of the site floor should be re-inspected at a later stage, after

the recycling operations are decommissioned and removed from the site.

2.5.17 The site of Lau Choi Kee Plastic Company Limited also looked untidy and dirty in general (Photos EA-24 to 28 of **Annex 2.4**). Bags of plastic wastes, plastic fragment, wasted cardboard and debris were found lying around the site area. Cracks were observed on the floor as vegetation were observed along the boundary of the site area. Some lubricant oils were stored on unpaved floor. Lubricant oil stain was found within the site area (refer to **Annex 2.4** Photo EA-33). Besides, large area of the floor surface was covered by debris, bags of waste plastic and other wastes during the site walkover, and the areas were mostly unpaved. It is recommended that the condition of the site floor should be re-inspected at a later stage, after the recycling operations are decommissioned and removed from the site.

2.5.18 Both the C & H Import and Export Co. (Lot No. STT 1450) and Lau Choi Kee Plastic Company Limited (Lot No. STT 1745) are identified as potentially land contaminated sites.

2.5.19 Site access to the remaining one STT site (Lot No. STT 1440) was not allowed by the tenants. Based on the types and nature of existing and past recycling industries operated in this STT site, chemicals such as fuel oils, metals, thinners, electrical cleaning solvent and lubricants could have been stored and handled on-site. This inaccessible STT site also has a potential to cause land contamination impact.

2.5.20 It is recommended to carry out site re-appraisals in all the STT areas of the proposed expansion site after the recycling operations are ceased and removed from the lots to confirm the land contamination potential and scope of Site Investigation (SI).

2.5.21 No potentially land contaminating activities were identified in the GLA site (Lot No. GLA-TPP 776) and the existing vacant land, which are being / have been used as site offices. Material storage was also observed at the existing DSD's and Contractor's site office (in Lot No. GLA-TPP 776). However, no chemical of concern was used nor stored at the site (Photos EA-2 to 9 of **Annex 2.4**). The existing vacant land is concrete paved (Photos EA-10 of **Annex 2.4**). No sign of land contamination (e.g. oil / chemical stain) was observed at both the GLA lot and the vacant land.

TPSTW Facilities outside the Proposed Excavation Works Boundary

2.5.22 The areas outside the proposed excavation works boundary but within TPSTW include internal access roads, vegetated areas, concrete buildings (SAS Thickening House, Fire Services Shelter, Water Tanks and Transformer House, Switch Road and Return Activated Sludge Pumping) and open wastewater treatment tanks (i.e. Final Sedimentation Tanks, Primary Sedimentation Tanks, Aeration Tanks) as shown in Photos V1 to V12 and A3 of **Annex 2.4A**. All these areas looked clean and tidy. No sign of land contamination such as oil stains and stressed plant is identified. All the concrete buildings outside the proposed excavation works limit will not be affected by the Project works and remain intact. No land contamination impact associated with the Project works is identified.

Surrounding Area of the Project Site

2.5.23 As observed during the site walkover and in the aerial photographs, the surrounding area are mainly industrial buildings. To the north are SWL Leachate Pre-treatment Works and Landfill Gas Treatment Plant, which are concrete paved and heavily vegetated (Photos V1 to V3 of **Annex 2.4B**) as well as industrial buildings or factories including: Hong Kong Yakult, Watson's Water, MAXIM's foods factory 2 and Luk Yeung Restaurant Limited (Photo A4 of **Annex 2.4B**); To the west are vehicular traffic road (Tai Kwai Street) and amenity planting (Photo V5 of **Annex 2.4B**) and further west (across Tai Kwai Street) are industrial buildings or factories such as Oriental Press Group Limited, Pc3 and Winner Good Products Limited; To the south are industrial buildings or factories including: Hung Fook Tong Group Limited, Process Automation International Limited, Sonopress, Hung Hing Printing Group Limited and Tong

Fung Hung (Photos V8 to V10 of **Annex 2.4B**). To the east is dense plantation on the SWRL. No oil stain or smell of oil leakage is observed. All the surrounding facilities in TPIE and SWRL looked clean and tidy. These facilities will not be affected by this Project and will remain intact during construction and operation of this Project. No potential land contamination issue is identified.

Chemical of Concerns (COCs)

2.5.24 Possible contaminating activities in the STT sites may include storage and processing of waste materials, storage and transfer of chemicals, solvents, fuels, lubricants for machinery and vehicle maintenance activities. Possible contaminating activities in TPSTW may include chemical spillage in the Lubricant Oil Store. Potential COCs in the contaminated areas of TPSTW and STT sites may include:

- Metals (including antimony, arsenic, barium, cadmium, chromium III, chromium VI, cobalt, copper, lead, manganese, mercury, molybdenum, nickel, tin and zinc).
- Petroleum carbon ranges (PCRs) including C6 – C8, C9 – C16 and C17 – C35.
- Volatile organic chemicals (VOCs) including BTEX (benzene, toluene, ethylbenzene, and total xylenes), MTBE (methyl tert-butyl ether), acetone, bromodichloromethane, 2-butanone, chloroform, methylene – chloride, styrene, tetrachloroethene, and trichloroethene.
- Semi-volatile organic chemicals (SVOCs) including polyaromatic hydrocarbons (PAHs) (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene), bis-(2-ethylhexyl)phthalate, hexachlorobenzene, and phenol.
- Polychlorinated biphenyls (PCBs).

2.5.25 Since no burning activities is observed is the STT sites, and the waste recycling workshops in the STT sites involved metals, raw paper/plastic etc. with no thermal treatment. Dioxin is not anticipated in these sites.

Table 2.3a Site Appraisal Findings of the Major Facilities and Areas within the Study Area in West Plant of TPSTW

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
Old Administration Building (39) **(252 m²)**	▪ The Old Administration Building is a two-storey building located on concrete paved slab. ▪ The building is used for administration works.	Photo No. WP-1, WP-2 and WP-3 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Electrical Workshop (40) **(233 m²)**	▪ The electronical workshop is located on concrete paved slab. ▪ Equipment and tools are stored properly. ▪ Cracks were observed on the floor. ▪ Maintenance activity of small equipment was carried out, but no chemicals were used or stored within the Electrical Workshop.	Photo No. WP-4 to WP-7 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Car Park (51) **(320 m²)**	▪ The car park is located on concrete paved floor with no oil stains/ leakage observed. ▪ Shelters were built to protect cars and the floor from weathering.	Photo No. WP-8 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Maintenance Building (14) **(643 m²)**	▪ The building is paved with concrete paved floor with no stains/ leakage observed. Only stain caused by weathering is observed. ▪ Equipment and tools are mainly stored in this building, some of them are placed on steel racks and wooden panel in good order,	Photo No WP-9 to WP-12 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	some bigger equipment was placed on the floor. ▪ Lubricant oil, Cutting Oil, Paint and wasted oil were stored inside the cabinets on concrete paved floor. ▪ No maintenance work was carried out in the building.			
Administration Building (15) **(348 m²)**	▪ The Administrative Building is a two-storey building located on concrete paved floor. The building housed offices and laboratory. The laboratory is located on the second floor of the building.	Photo No WP-13 to WP-16 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Control and Storage House (53) **(257 m²)**	▪ The Control Building is a two-storey building located on concrete paved slab with the storage room on the ground floor and the control room on the second floor. ▪ No oil stain or leakage is found on the floor this location	Photo No. WP-17 to WP-21 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Dangerous Goods Store (49) **(29 m²)**	▪ The Dangerous Goods (DG) Store comprises two DG store rooms located next to each other and close to the Maintenance Building on concrete paved floor. ▪ The store has been used to store chemicals (e.g. thinners) and lubricant oil (e.g. hydraulic oil, soluble cutting oil, etc.) ▪ All DG are properly stored and contained in DG tanks and located on steel panel on	Photo No WP-22 to WP-24 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	concrete paved floor. All floors observed are paved with concrete under steel panel with no oil stain or leakage observed. ▪ No record of leakage nor spillage was found in this location. The concrete paved floor can prevent soil contamination.			
Inlet Pumping Station (1) **(500 m²)**	▪ The Inlet Pumping Station is concrete paved and houses 4 screw pumps (each situated on concrete plinth of about 2.3m thick) located on the first floor of the building about 3.4m above ground level). Each pump was connected to a water transfer pipe down to about 5m below ground level (bgl). A control room is located on top of the screw pumps. ▪ Small amount of lubricating oil is typically required for the operation and maintenance of the screw pumps (located 3.4 m above the ground level). No chemical is stored. ▪ The concrete paved surfaces in all accessible areas were observed to be in good condition with no oil stains observed.	Photo No. WP-25 to WP28 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Screen House (2) **(203 m²)**	▪ The screen house is situated on concrete plinths with a control panel. ▪ The facilities only handle sewage. No potential and past land contaminating activities were identified and recorded.	Photo No WP-29 and WP-30 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	▪ All floors observed are paved with concrete in good condition with no oil stains observed.			
Detritors (3) **(668 m²)**	▪ There are 2 detritors within the detritor chambers which are of concrete construction for removing grits in sewage prior to further treatment. ▪ No potential and past land contaminating activities were identified and recorded. ▪ The detritors are located on concrete paved ground. All concrete surfaces observed were in good condition with no oil stains observed.	Photo No WP-31 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Final Sedimentation Tanks (6) **(5,343 m²)**	▪ There are 10 Final Sedimentation Tanks located in the West Plant for final wastewater sedimentation processes. ▪ The tanks contain wastewater only and are located on concrete paved ground of good condition with no oil stains / stressed vegetation / potentially contaminating activities observed.	Photo No WP-32, WP-33, WP-43, WP-44 and WP-45 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Primary Sedimentation Tanks (4) **(5,821 m²)**	▪ There are 8 Primary Sedimentation Tanks located in West Plant of TPSTW for primary wastewater treatment processes. ▪ The tanks mainly handle wastewater only and are located on concrete paved ground of good condition with no oil stains / stressed	Photo No WP-34, WP-38, WP-39, WP-40 and WP-41 in **Annex 2.4**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	vegetation / potentially contaminating activities observed.			
Aeration Tanks (5) **(4,260 m²)**	▪ There are 6 Aeration Tanks located in the West Plant of TPSTW for secondary wastewater treatment process. ▪ The Aeration Tanks contain sewage only and are located in a concrete paved area observed to be in good condition with no oil stains / stressed vegetation / potentially contaminating activities observed.	Photo No WP-35, WP-36 and WP-37 in **Annex 2.4**.	No land contamination impact is anticipated as no land contamination issues were identified.	No
Waste Storage Area (50) **(378 m²)**	▪ A waste storage area was observed in the site visit. ▪ The area is enclosed and surrounded by fence, with no oil stain. ▪ Only equipment, furniture and garbage are stored in this area. ▪ No chemical-containing waste was ever disposed of in the area since the operation of TPSTW as confirmed by the plant operator.	Photo No WP-42 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Workshop (55) **(189 m²)**	▪ The Workshop is located on concrete paved slab with shelters on the top of the workshops area. ▪ Water stain is observed due to bad weather, no oil stain/leakage is observed in this location.	Photo No. WP-46 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	▪ The Workshop is mainly used as store room and staff room for storing staff clothes and resting area for staff usage. ▪ No chemical was used or stored within the Workshop. ▪ No maintenance activity was carried out in the Workshop.			
Return Activated Sludge Pumping Station (8) **(424 m²)**	▪ The Return Activated Sludge Pumping Station only handles biologically active sewage sludge from the aeration tanks. ▪ The station is situated with the concrete plinths and concrete paved floors. ▪ Small amount of lubricating oil is typically required for the operation and maintenance of the pumps. No oil stain was observed. No incident of chemical spillage was recorded.	Photo No WPS-1 and WPS-2 **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Sludge Pumping Station (8) **(508 m²)**	▪ The Sludge Pumping House is situated on concrete plinths. ▪ There are 4 sludge pumping pumps handling sewage sludge only (at the bgl), a control panel (at ground floor) and an electronic boiler (at ground level). ▪ Small amount of lubricating oil would be used for the pump operation. The internal floors are paved with concrete in good condition with no oil stains observed.	Photo No WPS-3, WPS-4 and WPS-5 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	▪ No storage of chemicals and no historic chemical spills or leaks were recorded.			
Blower House (21) **(429 m²)**	▪ The Blower House is a single-storey building. ▪ All (5 sets of) air blowers are placed on the ground floor. According to the site representative, small amount of lubricating oil is used for operating the air blowers. The ground floor is paved with concrete in good condition with no oil stain. ▪ No storage of chemicals and no historic chemical spills or leaks were recorded.	Photo No WPS-6, WPS-7 and WPS-8 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Biogas Holding Tank (13) **(168 m²)**	▪ The biogas holding tank is located on concrete paved ground with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No. WPS-9 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Sludge Digestion Tanks (9) **(1,127 m²)**	▪ There are 2 Sludge Digestion Tanks in the West Plant of TPSTW. ▪ The tanks are constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No. WPS-10 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
Sludge Consolidation Tanks (10) **(978 m²)**	▪ There are 2 Sludge Consolidation Tanks in the West Plant of TPSTW. ▪ The tanks are constructed with concrete located on concrete paved ground in good condition with no oil stains /stressed vegetation or potentially contaminating activities observed in the area.	Photo No. WPS-11 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Filtrate Treatment Complex (25) **(279 m²)**	▪ The Filtrate Treatment Complex mainly handles the process of filtration to remove particles from suspension in the water ▪ The Complex is constructed with concrete located on concrete paved ground in good condition with no stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No WPS-12 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Filtrate Treatment Units (26) **(725 m²)**	▪ The Filtrate Treatment Units mainly handle the process of filtration to remove particles from suspension in the water. ▪ The Units are constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No WPS-13 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Primary Sludge Gravity Thickeners (16)	▪ There are 4 Primary Sludge Gravity Thickeners in the West Plant of TPSTW for handling primary sludge gravity thickening processes	Photo No WPS-14 in **Annex 2.4.**	No land contamination impact is anticipated as no land	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
(934 m²)	▪ The thickeners are constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.		contamination issues were identified.	
Chemical House (17) **(504 m²)**	▪ The Chemical House is located between the Sludge Dewatering House and the Extension of Sludge Dewatering House for material storage. Ferric chloride solutions were properly stored in the Chemical House. ▪ No chemical other than ferric chloride was stored in the Chemical House. ▪ The Chemical House is constructed with concrete and located on concrete paved ground in good condition with no oil stains.	Photo No WPS-17, WPS-18 and WPS-19 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Sludge Dewatering House (20) **(604 m²)**	▪ The Sludge Dewatering House is a 2-storey building. The internal floors were paved with concrete in good condition with no oil stains observed. ▪ The Sludge Dewatering House is mainly comprised of the following areas: 1) the Chemical Store and Handling Area which mainly consists of sludge dewatering facilities including 2 polymer mixing tanks and 2 ferric chloride storage tanks; 2) the Sludge Feed Pump Room which consists of 5 sets of sludge feed pumps and an air	Photo No WPS-15, WPS-16, WPS-20 and WPS-21 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
	compressor; and 3) the Sludge Loading Area and a General Store. No other chemical is stored in the Sludge Dewatering House ▪ All pumps and compressors were situated on concrete plinths in good condition. ▪ The facilities mainly handle sewage sludge. According to the site representatives, small amount of lubricating oil is required for operation and maintenance of all pumps and compressors. No oil stains were observed on the concrete paved floors. No incident of chemical spillage was recorded. ▪ All chemicals stored in the house are not COC.			
Extension of Sludge Dewatering House (24) **(277 m²)**	▪ The Extension of Sludge Dewatering House is located next to the Chemical House. ▪ All pumps and compressors were situated on concrete plinths in good condition. ▪ According to the site representatives, small amount of lubricating oil is required for operation and maintenance of all pumps and compressors. No oil stains were observed on the concrete paved floors. ▪ No incident of chemical spillage and no chemical storage was recorded.	Photo No WPS-22, WPS-23 and WPS-24 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
Combined Heat and Power Generating System (31) **(33 m²)**	▪ The Combined Heat and Power Generating System is located on concrete paved ground with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No WPS-25 and WPS-26 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Ferric Chloride Dosing System (33) **(40 m²)**	▪ The Ferric Chloride ($FeCl_3$) Dosing System #1 is located near the Filtrate Treatment Complex on an elevated platform with concrete slab. Shelter is constructed to protect the $FeCl_3$ from damage. ▪ The two $FeC1_3$ Storage Tanks are located on the concrete slab platform with barriers. ▪ $FeCl_3$ stain was observed on the platform and the floor but $FeCl_3$ is not a COC.	Photo No.WPS-27 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
UV Disinfection Facilities (29) **(191 m²)**	▪ The UV Disinfection Facilities is located on concrete paved slab. Vegetation is observed near the facilities in good condition. ▪ The floor under the shelter of the UV Disinfection Facilities is paved with concrete slab and covered by green floor mat. ▪ No oil stain/ leakage is observed.	Photo No. WPS-28 to WPS-29 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Effluent Pumping Station (18)	▪ The Wet Well of the Effluent Pumping Station is constructed with concrete paved bund wall. Treated effluent is transferred	Photo No. WPS-30 to WPS-34 in **Annex 2.4.**	No land contamination impact is anticipated as no land	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
(1393 m²)	from the UV disinfection facilities and stored in the wet well. ▪ The transfer pumps, gear boxes, monitors and the Control Panel are located on the ground floor of the Effluent Pumping Station. The floor is paved with concrete slab ▪ The transfer pumps are located under the ground floor. Assessible path is constructed with steel panel. ▪ The Gate Valve is located under the ground floor. The Gate Valve is connected to the Wet Well of the Effluent Pumping Station. ▪ Small amount of lubricating oil is required for operation and maintenance of pumps. ▪ No oil stain or leakage is observed. Water stain is observed due to handling of effluent.		contamination issues were identified.	
Transformer (56) **(20 m²)**	▪ The transformer is located on concrete paved floor surrounded by vegetation. No oil/leakage/stressed plant is found in this located. ▪ Cracks are observed near the transformer. However, the transformer is in good condition and maintained by CLP, No leakage of transformer oil is observed.	Photo No. WPS-35 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
West Plant				
Effluent Sampling Shelter (46) **(60 m²)**	▪ Effluent sampling equipment is observed in this location. ▪ The shelter is surrounded by vegetation, concrete paved road / paved surfaces. ▪ No oil stains and stressed vegetation are observed.	Photo No. WPS-36 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Table 2.3b Site Appraisal Findings of the Major Facilities and Areas within the Study Area in East Plant of TPSTW

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
Sludge Consolidation Tanks (10) **(921 m²)**	▪ There are three Sludge Consolidation Tanks in the East Plant of TPSTW. ▪ The tanks are constructed with concrete located on concrete paved ground in good condition with no oil stains /stressed vegetation or potentially contaminating activities observed in the area.	Photo No. EP-7 to EP-9 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Ferric Chloride Dosing System (33) **(32 m²)**	▪ The Ferric Chloride ($FeC1_3$) Dosing System #2 is located on an elevated platform with concrete slab. Shelter is constructed to protect the $FeCl_3$ from damage. ▪ The two $FeC1_3$ Storage Tanks are located on the concrete slab platform with barriers ▪ $FeCl_3$ stain was observed but $FeC1_3$ is not a COC.	Photo No. EP-10 and EP-13 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Sludge Digestion Tank (9) **(1,723 m²)**	▪ There are three Sludge Digestion Tanks in the East Plant of TPSTW. ▪ The tanks are constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No. EP-11 to EP-12 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Biogas Holding Tank (13) **(164 m²)**	▪ There are two Biogas Holding Tanks in the East Plant of TPSTW. ▪ Both tanks are located on concrete paved ground with no oil stains / stressed	Photo No. EP-14 to EP-15 in **Annex 2.4.**	No land contamination impact is anticipated as no land	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
(144 m²)	vegetation or potentially contaminating activities observed in the area.		contamination issues were identified.	
Screen House (2) **(548 m²)**	▪ The screen house is situated on concrete plinths with a control panel. ▪ Emergency generators including 1 Generator Daily Fuel (Diesel Oil) Tank (450L) is observed inside this facility. The floor is paved with concrete slab. ▪ The Generator Daily Fuel Tank is located in bund wall constructed with an elevated concrete platform. The tank looked clean. No oil stain/leakage is observed in this location. ▪ The facilities mainly handle sewage. No potential and past land contaminating activities were identified and recorded. ▪ All floors observed are paved with concrete in good condition with no oil stains observed.	Photo No. EP-16, EP-17, EP-39 and EP-40 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Inlet Pumping Station (1) **(570 m²)**	▪ The settings, condition and environment of this Inlet Pumping Station are similar to that of the Inlet Pumping Station located in the West Plant.	Photo No. EP-18 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Combined heat and power generating system (31)	▪ The Combined Heat and Power Generating System is located on concrete paved ground with no oil stains / stressed vegetation or	Photo No. EP-19 and EP-25 in **Annex 2.4.**	No land contamination impact is anticipated as no land	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
(299 m²)	potentially contaminating activities observed in the area.		contamination issues were identified.	
Primary Sludge Gravity Thickener (16) **(322 m²)**	▪ There are 1 Primary Sludge Gravity Thickener in the East Plant of TPSTW for handling primary sludge gravity thickening processes ▪ The thickeners are constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.	Photo No. EP-20 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Decanting Chamber (47) **(22 m²)**	▪ The Decanting Chamber is located on concrete paved floor connecting to the Primary Sludge Gravity Thickener surrounding by vegetation. ▪ The chamber is in good condition where no damage/ leakage / oil stain / stressed plant is found.	Photo No. EP-21 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Lubricant Oil Store (52) **(248 m²)**	▪ The Lubricant oil store is located on concrete paved floor. It is mainly used for storing lubricant oil and chemical waste. ▪ The Lubricant Oil Store includes a Lubricant Oil Storage Room (a concrete building) and a Gear Oil Station (an open storage area) ▪ Oil stain is observed on the concrete paved floor of both the Lubricant Oil Store Room and the Gear Oil Station.	Photo No. EP-22, EP-22a, EP-23 and EP-24 in **Annex 2.4**.	Possible land contamination with metals (full list), PCRs, VOCs, SVOCs and PCBs	Yes

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
Central Building Complex (23) **(801 m²)**	▪ The Central Building Complex is a two-storey building, with the equipment storage on the ground floor and the control room together with staff room on the second floor. ▪ The floor is paved with concrete slab in good condition with no oil stain/leakage is observed.	Photo No. EP-26, EP-27 and EP-28 in **Annex2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Waste Biogas Burner (42) **(39 m²)**	▪ The biogas burn is used to burn the methane generated from wastewater process. ▪ The Waste Biogas Burner is located on an elevated platform with concrete slab on concrete paved floor. ▪ The biogas is not classified as a COC. Handling and burning of biogas, which is a gaseous fuel, will not lead to land contamination. ▪ Diesel oil are stored inside the fuel oil tanks within a bunded area at this location. ▪ No oil stain/leakage is observed in this area.	Photo No. EP-29 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Gas Transfer Station (44) **(34 m²)**	▪ The Gas Transfer Station is located on concrete paved floor next to the Screen House. ▪ Biogas is not a COC. The fuel is in gaseous form and will not lead to land contamination. ▪ No other chemical is stored in this station.	Photo No. EP-30 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
	▪ No oil stain/ leakage is observed in this location.			
Biogas Holding Tank Valve Chamber (35) **(56 m²)**	▪ The Biogas Holding Tank Valve Chamber is located on concrete slab elevated platform next to the Biogas Holding Tank. ▪ Water stain is observed and no oil stain/leakage is observed.	Photo No. EP-31 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Service Tower Building (54) **(93 m²)**	▪ The Service Tower Building is located on concrete paved slab. ▪ Pumps area connected to the Sludge Digestion Tanks of the East Plant outside the Tower. Rusty stain and water stain were observed due to handling of sludge ▪ No oil stain / leakage is observed.	Photo No. EP-32 to EP-34 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Detritors (3) **(385 m²)**	▪ The detritors are located on concrete paved ground. All concrete surfaces observed were in good condition with no oil stains observed.	Photo No. EP-37 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Primary Sedimentation Tank Distribution Chamber (19) **(80 m²)**	▪ The Primary Sedimentation Tank Distribution Chamber is connected to the two Detritors on the elevated slope with a concrete paved platform surrounding by vegetation. No oil stain/ leakage / stressed plant is observed.	Photo No. EP-38 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (ID in Annex 2.1A) (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
East Plant				
Chemical Store (32) **(78 m2)**	▪ The chemical store is located on concrete paved floor. ▪ Leatheroid are found on steel panel inside the chemical store above concrete paved floor. Some leatheroid are located on wooden panel. ▪ Store empty drums are found inside the chemical store on steel panel above the concrete paved floor. ▪ Caustic Soda were stored inside cans on steel panel inside the chemical store above concrete paved floor. ▪ No oil stain/leakage is observed.	Photo No. EP-41 to EP-43 in **Annex 2.4**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Table 2.3c Site Appraisal Findings of the Major Facilities and Areas within the Study Area in Proposed Expansion Site

Facility /Area (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
Proposed Expansion Site				
Canny Star Environmental Protection Limited	▪ The site is located in Lot No. STT 1449 of the proposed expansion site. ▪ Site walks and questionnaire surveys were not allowed by the tenants.	Photo No. EA-1 in **Annex 2.4.**	Possible land contamination with metals (full list), PCRs, VOCs, SVOCs and PCBs	Yes

Facility /Area (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
Proposed Expansion Site				
(6,891 m²)	▪ According to the record of Lands Department, existing and past site activities may involve recovery and recycling of metals, paper, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood or furniture in municipal solid waste. ▪ Possible existing and past contaminating activities may include storage and processing of waste materials, storage and transfer of chemicals, solvents, fuels, lubricants for machinery and vehicle maintenance activities.			
DSD's and Contractor Site Office (2,020 m²)	▪ The DSD's site Office is located in Lot No. GLA-TPP 776 of the proposed expansion site. ▪ No previous uses with potential land contamination issue has been identified.	Photo No. EA-2 to EA-9 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No
Vacant Land (909 m²)	▪ The vacant land is located next to the existing DSD's office. ▪ The vacant land was previously used as CEDD's and Contractor's site offices. ▪ No previous uses with potential land contamination issue has been identified.	Photo No. EA-10 in **Annex 2.4.**	No land contamination impact is anticipated as no land contamination issues were identified.	No

Facility /Area (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
Proposed Expansion Site				
C & H Import & Export Co. **(2,818 m²)**	▪ The C & H Import and Export Co. is located in Lot No. STT 1450 of the proposed expansion site. ▪ It is a metal / steel recycling workshop and warehouse for storage of metal / steel waste operated since 2012. ▪ From site inspection, stockpiles of metal waste, large machineries and equipment were found in the open site area. Some fuel oil was stored in open area with no bund wall and no secondary containment. ▪ No record of previous land use before 2012 is available. It is likely that the site was also used for waste recycling in the past. ▪ Possible existing and past contaminating activities may include storage and processing of waste materials, storage and transfer of chemicals, solvents, fuels, lubricants for machinery and vehicle maintenance activities.	Photo No. EA-11 to EA-23 in **Annex 2.4.**	Possible land contamination with metals (full list), PCRs, VOCs, SVOCs and PCBs	Yes

Facility /Area (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
Proposed Expansion Site				
Lau Choi Kee Plastic Company Limited **(2,620 m²)**	▪ Lau Choi Kee Plastic Company Limited is located in Lot No. STT 1745 of the proposed expansion site (operated since 2017). ▪ It is a plastic recycling workshops, operations involve recovery and recycling or reprocessing of plastics from municipal solid waste. ▪ From site inspection, stockpiles of plastic waste, large amount of plastic fragment, waste carboards were found within the site area. Some lubricant oil was stored under shelter on unpaved floor. Oil stain was found on unpaved floor with no panel or secondary containment. ▪ From available record, Fook Woo Waste Paper Company Limited operated in this site from 2013 to 2017. It was a business in the recovery and recycling or reprocessing of metals, papers, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood and furniture, organic waste (excluding chemical waste) or any combination of the above materials found in and recovered from municipal solid waste. ▪ Site facilities were observed in the site before 2013 from historic aerial photos but there is no record on the past land use before 2013.	Photo No. EA-24 to EA-38 in **Annex 2.4.**	Possible land contamination with heavy metals (full list), PCRs, VOCs, SVOCs and PCBs	Yes

Facility /Area (Approx. area)	Site Appraisal Findings	Reference	Potential Land Contamination Impact	Necessity for Intrusive Site Investigation (SI)
Proposed Expansion Site				
	▪ Possible existing and past contaminating activities may include storage and processing of waste materials, storage and transfer of chemicals, solvents, fuels, lubricants for machinery and vehicle maintenance activities.			

2.6 Future Land Uses

2.6.1 Land contamination assessment on the potentially contaminated sites would need to be evaluated against the Risk-based Remediation Goals (RBRGs), soil saturation limits (Csat) / solubility limits for non-aqueous phase liquid (NAPL), as stipulated in Table 2.1 and Table 2.2 of the Guidance Manual.

2.6.2 The RBRGs were developed based on a risk assessment approach to suit the local environmental conditions and community needs in Hong Kong. Decisions on contaminated soil and groundwater remediation are based on the nature and extent of the potential risks that are posed to human receptors as a result of exposure to chemicals in the soil and/or groundwater. RBRGs were developed for four different land use scenarios as below reflecting the typical physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater:

- Urban residential
- Rural residential
- Industrial
- Public parks

2.6.3 In addition to the RBRGs, screening criteria (soil saturation limits, Csat, developed for NAPL in soil and solubility limits for NAPL in groundwater) for the more mobile organic chemicals must be considered to determine whether a site requires further action.

2.6.4 As the proposed development is a sewage treatment works and sewage sludge and pre-treated food waste co-digestion facilities, the RBRGs for Industrial land use scenario are considered appropriate for the assessment.

2.6.5 The corresponding RBRGs levels, soil saturation limits (Csat) and the solubility limits are presented in **Annex 2.5.**

3 Potential Contaminated Sites

3.1 Potential Contaminated Sites for Site Investigation

3.1.1 According to the findings of the site appraisal, the following 4 facilities/areas in were identified with potential land contamination concerns:

- Lubricant Oil Store
  (Refer to **Annex 2.4** photo no. EP- 22)
- Lot No. STT 1449 – Canny Star Environmental Protection Limited
  (Refer to **Annex 2.4** photo no. EA-1)
- Lot No. STT 1450 - C & H Import and Export Co.
  (Refer to **Annex 2.4** photo no. EA- 11 to EA-23)
- Lot No. STT 1745 - Lau Choi Kee Plastic Company Limited
  (Refer to **Annex 2.4** photo no. EA- 24 to EA-38)

3.1.2 Further site investigation (SI) works are recommended for confirming any land contamination in these concerned areas. The locations of these facilities / areas (with potential and contamination issues) are shown in **Figure 4.1.** The potential COCs identified include metals, PCRs, VOCs, SVOCs and PCBs.

3.1.3 Based on the findings of site appraisal, apart from the above areas, no land contamination issue was identified in the remaining facilities and areas within the Study Area. In addition, according to the historical records, no relocation of facilities (e.g. chemical / DG storage area) within the TPSTW were noted since their construction. Widespread contamination is therefore not envisaged across the TPSTW site and any land contamination is likely to be restricted within or near the Lubricant Oil Store. As such, further SI works is considered not necessary in the remaining facilities of TPSTW (also see Section 2.2.7).

3.2 Site Re-appraisal

3.2.1 All the potential contaminated sites are currently in operation and it would not be feasible to carry out SI works under the EIA Study. In addition, one of the concerned sites (Lot No. STT 1449) was inaccessible for site walkovers at the time of preparing the CAP.

3.2.2 Therefore, prior to the development of these areas and after decommissioning and removal of the existing operations in the concerned sites, a consultant should be appointed by the Project Proponent (PP) to re-appraise these areas to investigate any contaminative issues associated with the current land uses and activities within the Study Area.

3.2.3 The supplementary CAP (s), incorporating the findings of the site re-appraisal and the updated sampling and testing strategy, should be prepared and submitted to EPD for agreement prior to the commencement of SI works.

3.2.4 SI works should then be conducted according to the supplementary CAP(s). Contamination Assessment Report(s) (CAR(s)) and Remediation Action Plan(s) (RAP(s)), if contaminated soil and/or groundwater is identified, should be prepared and submitted to EPD for agreement. Any identified contaminated soil and groundwater shall be treated according to RAP(s) approved by EPD. Remediation Report(s) (RR(s)) shall be submitted to EPD for endorsement after the completion of the remediation works. No development works at the contaminated areas shall be commenced prior to EPD's agreement of the RR.

4 SAMPLING AND TESTING PLAN FOR SITE INVESTIGATION

4.1 General

4.1.1 Borehole drilling method is proposed to be employed in the SI to investigate and determine the presence of soil and groundwater contamination. Soil boring/excavation and sampling will be supervised by a land contamination specialist. The soil sampling methodologies will be based on methods developed by the US EPA, and adapted to Asian standards of operation and practice, as appropriate. These methods include decontamination procedures, sample collection, preparation and preservation, and chain-of-custody documentation as described in the following sections.

4.1.2 As discussed in **Section 3.1.1**, four potentially contaminated location/sites have been identified within the Study Area. As the identified sites are still in operation, the concerned site areas are mostly covered (e.g. by site facilities, protective metal plates, tanks, machineries, wastes and equipment etc.). The floor conditions and most of the site areas could not be clearly examined during the site appraisal. The exact contamination hotspots, SI / borehole locations cannot be confirmed at the EIA stage. It is recommended that site re-appraisal should be carried out in these sites once the site is clear for site inspection. A tentative SI plan based on the current findings is presented in the following section. Further revision to the SI plan after site re-appraisal shall be documented in the supplementary CAP(s).

4.1.3 The geological and hydro-geological conditions of the assessment area the relevant GI records are provided in Section 2.3 and **Annex 2.7**.

4.2 Site Investigation Locations

4.2.1 A total of 82 borehole locations are tentatively proposed for SI to study the vertical profile of possible contamination within concerned areas with land contamination potential. The borehole locations are illustrated in **Figure 4.1**. The exact borehole locations are subject to adjustment according to the findings of the site-reappraisal as discussed in **Section 3.2** above as well as the actual site conditions and existence of underground structures/utilities. The Chemicals of Concern (COCs) proposed for laboratory analysis included metals, VOCs, SVOCs, PCRs and PCBs. The sampling and testing plan with rationale is presented in **Table 4.1**.

Table 4.1 Sampling and Testing Plan

Facility /Area (approx. area)	Concerned Area (approx. area)	Grid Size (m)	Proposed Number of Borehole	Borehole ID (refer to Figure 4.1)	Rationale	Tentative Sampling Method	Tentative Sample Matrix / Depth (2)		Texting Parameters (4), (5)				
									Metals	VOCs	SVOCs	PCRs	PCBs
Existing TPSTW													
Lubricant Oil Store (248 m²)	Whole area of Lubricant Oil Store (248 m²)	6 (6)	9	A1 – A9	The site has been used for chemical storage for 15 years. A grid approach with refence to the Practice Guide is proposed for SI works.	Borehole drilling to 2m below the groundwater (GW) table or 6m bgl. (2)	Soil	(i) 0.5m bgl; (ii) 1.5m bgl; (iii) 3.0m bgl; and (iv) above GW level if present or if no GW encountered, 6m bgl	✓ Full list	✓ Full list	✓ Full list	✓ Full list	✓
							GW	One sample if GW is present (3)					
Proposed Expansion Site													
Lot No. STT 1449 - Canny Star Environmental Protection Limited (6,891 m²)	Whole area of Lot No. STT 1449 (6,891 m²)	17 (6)	31	B1 – B31	The site has been used by different waste recycling companies for 17 years. A grid approach with refence to the Practice Guide is proposed for SI works.	Borehole drilling to 2m below the groundwater (GW) table or 6m bgl. (2)	Soil	(i) 0.5m bgl; (ii) 1.5m bgl; (iii) 3.0m bgl; and (iv) above GW level if present or if no GW encountered, 6m bgl	✓ Full list	✓ Full list	✓ Full list	✓ Full list	✓
							GW	One sample if GW is present (3)	✓ Mercury	✓ Full list	✓ Full list	✓ Full list	✓
Lot No. STT 1450 - C & H Import & Export Co. (2,818 m²)	Whole area of Lot No. STT 1450 (2,818 m²)	13 (6)	21	C1 – C21	The site has been used by different waste recycling companies for 15 years. A grid approach with refence to the Practice Guide is proposed for SI works.	Borehole drilling to 2m below the groundwater (GW) table or 6m bgl. (2)	Soil	(i) 0.5m bgl; (ii) 1.5m bgl; (iii) 3.0m bgl; and (iv) above GW level if present or if no GW encountered, 6m bgl	✓ Full list	✓ Full list	✓ Full list	✓ Full list	✓
							GW	One sample if GW is present (3)	✓ Mercury	✓ Full list	✓ Full list	✓ Full list	✓
Lot No. STT 1745 - Lau Choi Kee Papers Company Limited (2,620 m²)	Whole Area of Lot No. STT 1745 (2,620 m²)	13 (6)	21	D1 – D21	The site has been used by different waste recycling companies for 15 years. A grid approach with refence to the Practice Guide is proposed for SI works.	Borehole drilling to 2m below the groundwater (GW) table or 6m bgl. (2)	Soil	(i) 0.5m bgl; (ii) 1.5m bgl; (iii) 3.0m bgl; and (iv) above GW level if present or if no GW encountered, 6m bgl	✓ Full list	✓ Full list	✓ Full list	✓ Full list	✓
							GW	One sample if GW is present (3)	✓ Mercury	✓ Full list	✓ Full list	✓ Full list	✓

Notes:

(1) bgl = Below ground level; GW = groundwater

(2) All potential land contaminative activities were identified at or above the ground level. No underground source of contamination nor underground chemical storage / usage is identified in the concerned areas. Boreholes are proposed to be advanced to approximately 2m below the stabilized water table or if no groundwater were encountered, a depth of 6m bgl. Where there are suspected signs of contamination, extra samples shall be taken for laboratory analysis.

(3) Samples will only be collected if groundwater is encountered during the SI works.

(4) The testing parameters refer to the parameters shown in Table 2.1 – RBRGs for Soil & Soil Saturation Limit and Table 2.2 – RBRGs for Groundwater and Solubility Limit under VOCs, SVOCs (including PAHs), Metals, PCBs and PCRs in the Guidance Manual (also see **Section 2.5.12** above and **Annex 2.5**).

(5) For SVOCs, since the RBRG values of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis-(2-Ethylhexyl)phthalate, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene and Phenol were not available for groundwater, the captioned parameters would not be tested in groundwater sample. Similarly, groundwater sample would only be tested for mercury, as no RBRG values are available for other metals.

(6) The grid size is proposed with reference to the requirements in the Practice Guide.

4.3 Soil Sampling Method and Depth of Sampling

4.3.1 All soil boring / excavation and sampling shall be supervised by a land contamination specialist.

4.3.2 Boreholes should be advanced by dry rotary drilling, i.e. without the use of flushing medium, to prevent cross-contamination during sampling. For safety reasons, an inspection pit should be excavated to 1.5m below ground level (bgl) to confirm the absence of underground utilities at the proposed borehole location and disturbed soil samples, using stainless steel hand tools or other appropriate equipment, should be collected at depth of 0.5m bgl. Soil boring using drill rigs should then be performed from depth of 1.5m bgl to the maximum boring depth. Undisturbed U100/U76 soil samples should be collected at depths from 1.5m and onwards. Boreholes are proposed to be advanced to approximately 2m below the stabilized water table or if no groundwater were encountered, a depth of 6m bgl. All the potential contaminative activities were identified at or above the ground level. As no underground source of contamination nor underground chemical storage / usage is identified in the concerned areas. The soil sampling of up to 6m bgl or 6m below the surface contamination source is considered sufficient. Where there are suspected signs of contamination, extra samples should be taken for laboratory analysis.

4.3.3 The sampling number and sampling depth shall be updated in the supplementary CAP as discussed in **Section 3.**2 according to the latest design.

4.3.4 For area where drilling of borehole is not possible (e.g. presence of underground utilizes, limitation of headroom space, etc.), relocation of borehole should be considered.

4.3.5 At each sampling location/depth, sufficient quantity of soil (as specified by the laboratory) should be recovered to facilitate analyses of the specified suite of parameters. All soil samples should be uniquely labelled. Backup samples should be retained and stored at 0 - 4 ºC in laboratory.

4.4 Strata Logging

4.4.1 Strata logging for boreholes should be undertaken during the course of drilling/digging and sampling by a qualified geologist. The logs should include the general stratigraphic description, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics should also be recorded.

4.5 Groundwater Sampling and Free Product Measurement

4.5.1 Groundwater samples should be collected at each of the sampling location if groundwater were encountered

4.5.2 At each borehole location, a groundwater sampling well should be installed unless agreed otherwise by the land contamination specialist. A typical design of a groundwater monitoring well is shown in **Annex 2.6**. After installation of the monitoring wells, the depth to water table at all monitoring wells should be measured with an interface probe in order to assess groundwater gradients and predominant flow direction. The monitoring wells should be resistant to chemical and microbiological corrosion and degradation in contaminated and uncontaminated waters. Well materials should be decontaminated prior to installation. Wells should also not react and interfere with the chemical characteristics of the groundwater. Well sections should be connected together using appropriate methods such as pre-fabricated threaded joints or rivets and not connected using solvent based glues. Empty voids between the well pipe and the borehole may be packed with clean gravels and sand. Wells should be

secured to prevent contamination from the surface, typically bentonite and cement are used to fill the top of the void and well caps are used to close the pipe.

4.5.3 If groundwater is encountered, a groundwater sample should be taken after all required soil samples have been collected. The sampling location shall be pumped to near dry and allowed to stand for 24 hours before sampling

4.5.4 Groundwater level and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken. In the unlikely event that measurable thicknesses of free product were encountered, a sample should be collected for laboratory analysis to determine the composition.

4.5.5 After purging, one groundwater sample should be collected at each well using Teflon bailer and decanted immediately into appropriate sample containers in a manner that minimizes agitation and volatilization of VOCs from the samples for the purpose of storage and transportation. The sample containers should be supplied by the laboratory and should be new, clean and made of 'amber glass'. Groundwater samples should be placed in the glass containers with zero headspace and promptly sealed with a septum-lined cap. All samples should be uniquely labelled.

4.5.6 Immediately after collection, samples should be placed in ice chests, cooled and maintained at temperature of about 0-4ºC until delivered to the analytical laboratory.

4.6 Sample Size and Decontamination Procedures

4.6.1 All down hole or digging equipment should be decontaminated between drilling, digging and sampling event to minimize the potential for cross contamination. The equipment (including drilling pit, digging tools and soil/groundwater samplers) should be decontaminated by washing with phosphate-free detergent and rinsed with distilled / deionized water.

4.6.2 Prior to sampling, the laboratory responsible for analysis should be consulted on the particular sample size and preservation procedures that are necessary for each chemical analysis.

4.6.3 The sample containers should be laboratory cleaned, sealable, water-tight, made of glass or other suitable materials with aluminum or Teflon-lined lids, so that the container surface will not react with the sample or adsorb contaminants. No headspace should be allowed in the containers which contain samples to be analyzed for VOCs, petroleum carbon ranges or other volatile chemicals.

4.6.4 The containers should be marked with the sampling location codes and the depths at which the samples were taken. If the contents are hazardous, this should be clearly marked on the container and precautions taken during transport. Samples should be stored at between 0-4 ºC but never frozen. Samples should be delivered to the laboratory on the same day the sample being taken and analyzed within the respective holding time, but, in any case, not more than 10 days after samples being taken.

4.7 QA/QC Procedures

4.7.1 Quality Assurance/ Quality Check (QA/QC) samples should be collected in the following frequency during the SI works. Chain of Custody protocol should be adopted.

- 1 equipment blank per 20 samples;
- 1 field blank per 20 samples;
- 1 duplicate per 20 samples; and
- 1 trip blank sample per trip for volatile parameters (VOCs and petroleum carbon range C6-C8).

4.7.2 The number of boreholes or soil sampling locations will be subject to the findings of the site re-appraisal to be carried out at a later stage as detailed in Section 3.2. The exact number of QA/QC samples will be provided in the supplementary CAP as discussed in **Section 3.2**.

4.8 Health and Safety

4.8.1 The specific safety measures to be taken depend on the nature and content of contamination, the site conditions and the regulations related to site safety requirements. Workmen Compensation Insurance and third-party insurance must be provided for the site investigation (SI).

4.8.2 Extreme care should be exercised in the event that potentially toxic gases or other suspected hazardous materials are encountered. Any abnormal conditions found shall be reported immediately to the safety officer and the land contamination specialist.

4.8.3 The SI contractor shall establish and maintain a Health and Safety Plan before commencement of the SI that will include the following:

- Instruction of works on work procedures, safe practices, emergency duties, and applicable regulations;
- Regularly scheduled meetings of the workers in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;
- Good housekeeping practices; and
- Availability of and instruction in the location, use and maintenance of personal protective equipment.

4.8.4 The SI contractor shall maintain equipment and supplies reasonably required in an emergency, including lifesaving, evacuation, rescue and medical equipment in good working order and condition at all times. The SI contractor shall use all reasonable means to control and prevent fires and explosions, injury to personnel and damage to equipment of property. Without limiting the foregoing, the SI contractor shall:

- Maintain proper safety devices, barriers to minimize hazards during performance of the work;
- Prohibit smoking and open flames and the carrying of matches and lighters;
- Develop and maintain a written emergency plan applicable to the Work and Site;
- Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;
- Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;
- Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for existing work, weather and environmental conditions; and
- The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.

4.9 Laboratory Analysis

4.9.1 **Table 4.1** summarizes the parameters, the recommended reporting limits and reference methods for the laboratory analyses of soil and groundwater samples for the COCs under this land contamination assessment.

Table 4.1 Parameters, Reporting Limits and Reference Methods for Laboratory Analysis

Parameters	Soil		Groundwater	
	Reporting Limit (mg/kg)	Refence Method (1)	Reporting Limit (mg/L)	Refence Method (1)
VOCs				
Acetone	50	USEPA 8260	0.5	USEPA 8260
Benzene	0.2		0.005	
Bromodichloromethane	0.1		0.005	
2-Butanone	5		0.05	
Chloroform	0.04		0.005	
Ethylbenzene	0.5		0.005	
Methyl tert-Butyl Ether	0.5		0.005	
Methylene Chloride	0.5		0.05	
Styrene	0.5		0.005	
Tetrachloroethene	0.04		0.005	
Toluene	0.5		0.005	
Trichloroethene	0.1		0.005	
Xylenes	2		0.02	
SVOCs				
Acenaphthene	0.5	USEPA 8270	0.002	USEPA 8270
Acenaphthylene	0.5		0.002	
Anthracene	0.5		0.002	
Benzo(a)anthracene	0.5		-	
Benzo(a)pyrene	0.5		-	
Benzo(b)fluoranthene	0.5		0.001	
Benzo(g,h,i)perylene	0.5		-	
Benzo(k)fluoranthene	0.5		-	
Bis-(2-Ethylhexyl)phthalate	5		-	
Chrysene	0.5		0.001	
Dibenzo(a,h)anthracene	0.5		-	
Fluoranthene	0.5		0.002	
Fluorene	0.5		0.002	
Hexachlorobenzene	0.2		0.004	
Indeno(1,2,3-cd)pyrene	0.5		-	
Naphthalene	0.5		0.002	
Phenanthrene	0.5		0.002	
Phenol	0.5		-	
Pyrene	0.5		0.002	
Metals				
Antimony	1	USEPA 6020	-	USEPA 6020
Arsenic	1		-	
Barium	1		-	
Cadmium	0.2		-	
Cobalt	1		-	
Copper	1		-	
Lead	1		-	
Manganese	1		-	
Mercury	0.2		0.0005	
Molybdenum	1		-	
Nickel	1		-	
Tin	1		-	
Zinc	1		-	
Chromium III (2)	1	By calculation	-	-
Chromium VI	1	USEPA 3060	-	-
PCBs				

Parameters	Soil		Groundwater	
	Reporting Limit (mg/kg)	**Refence Method (1)**	**Reporting Limit (mg/L)**	**Refence Method (1)**
PCBs	0.1	USEPA 8270	0.001	USEPA 8270
Petroleum Carbon Ranges (PRRs)				
C6 - C8	5	USEPA 8015	0.02	USEPA 8015
C9 - C16	200		0.5	
C17 - C35	500		0.5	

Notes:

(1) Alternative testing methods with accreditation by HOKLAS or its Mutual Recognition Arrangement partners are also accepted.

(2) Chromium III is quantified by calculation based on Chromium VI and Total Chromium measured under HOKLAS accredited methods.

4.9.2 For sample dispatch and laboratory receipt, chain of custody documentation should be included as QA/QC procedures. All laboratory testing methods for the above parameters should be accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or one of its Mutual Recognition Arrangement partners.

5 Evaluation of Potential Land Contamination Impact and Possible Remediation Measures

5.1 Evaluation of Potential Land Contamination Impact

5.1.1 Based on the site appraisal, 1 facility within the site of TPSTW and 3 areas within extension site of TPSTW as listed in **Section 3.1** were identified with potential land contamination concerns and require further SI works. However, as all the concerned areas are in operation, it would not be feasible to carry out the proposed SI works under the EIA Study.

5.1.2 Land contamination assessment including intrusive SI works and, if required, remediation works would need to be carried out at a later stage of the Project and should follow EPD's Guidance Manual, Guidance Note and Practice Guide. Any soil/groundwater contamination would be identified and properly treated prior to the commencement of construction works under the Project. The potential COCs identified include metals, VOCs. SVOCS, PCBs and PCRs and as discussed in **Section 5.2** below, there are commercially available technologies that could tackle these COCs.

5.1.3 Given the above, land contamination impacts are considered not insurmountable to the Project if the recommended actions as outlined in **Section 5.2** are followed and contaminated soil and groundwater (if any) were properly treated using appropriate remediation methods and according to EPD's agreed Remediation Action Plan (RAP)

5.2 Possible Remediation Measures

5.2.1 The actual remediation methods could only be determined after completion of the land contamination assessment (including intrusive SI works and EPD's agreement on the Contamination Assessment Report (CAR) and RAP at the later stage of the Project. The RAP will provide details of the remedial actions for any identified contaminated soil and groundwater.

5.2.2 Based on the site appraisal, the potential COCs may include metals, VOCs. SVOCS, PCBs and PCRs. For contaminated soil, the possible technologies commercially available to tackle the identified COCs are presented in the Practice Guide. Technologies that are commonly used in Hong Kong are bio-piling and cement solidification/stabilization (S/S). These ex-situ methods were proven to be effective in treating the target COCs and the treated soil could then be reused on site or offsite (as backfilling materials).

5.2.3 The entire expansion site (including two pieces of uncontaminated lands, i.e. the two GLA sites) can be made available for undertaking the bio-piling or cement S/S operations (after decommissioning or removal of the existing facilities in the expansion site). The exact amount of contaminated material and required land will be ascertained after the site re-appraisal and SI works for development of a detailed land remediation programme. The areas or phasing of the land remediation works will be subject to the contractor design and EPD's agreement.

5.2.4 Disposal of treated contaminated soil to landfill should only be considered as the last resort. Prior agreement to the proposed disposal arrangement should be sought from the Waste Faculties Management Group and Waste Policy and Service Group of the EPD.

5.2.5 For groundwater, there are examples of remediation techniques as shown in EPD's Practice Guide (e.g. air sparging, recovery trenches / wells, in-ground containment/capping and permeable reactive barriers) that could be applied to this Project if contaminated groundwater were indeed identified.

6 Way Forward and Program Schedule

6.1.1 The Lubricant Oil Store in TPSTW and waste recycling areas in the proposed expansion site are identified as potential contaminated areas. All of these sites are currently in operation and it would not be feasible to carry out the proposed SI works under the EIA Study.

6.1.2 The construction works of this Project are tentatively scheduled to commence in 2025 for completion in 2036. The proposed SI work and any necessary remediation action are recommended to be carried out after decommissioning of the Lubricant Oil Store and recycling facilities but prior to the commencement of the Project construction works at the concerned areas.

6.1.3 Prior to the commencement of the SI works, site re-appraisal shall be conducted for the whole study area to review the findings of this CAP. The site re-appraisal shall take into account of any uses within the Study Area and any change in uses within the Study Area. Supplementary CAP(s), presenting findings of the review, the latest site conditions and updated sampling strategy and testing protocol, should be submitted to EPD for endorsement. The SI works should be carried out according to EPD's agreed supplementary CAP(s). Following completion of SI works and receipt of laboratory test results, CAR(s) should be prepared to present the findings of the SI works and to discuss the presence, nature and extent of contamination. If contamination is identified, RAP(s) which provides details of the remedial actions for the identified contaminated soil and / or groundwater should be endorsed by EPD.

6.1.4 Remediation action, if necessary, will be carried out according to EPD endorsed RAP(s) and Remediation Report(s) (RR(s)) will be submitted after completion of the remediation action. The RR(s) should be endorsed by EPD prior to the commencement of construction works at the respective identified contaminated areas (if any). Assuming that the short-term tenancies of the STT lots in the proposed expansion site can be terminated in 2024 and the associated recycling facilities can also be decommissioned in 2024, the tentative report submission schedule for the proposed expansion site is provided below (assuming that the land remediation works can be carried out off-site as needed).

- Supplementary CAP for proposed expansion site – Mid 2024
- CAR and RAP for proposed expansion site – End 2024
- RR for proposed expansion site – End 2025

6.1.5 According to the tentative construction programme, the construction of the New West Plant within the proposed expansion site would commence in 2025 for completion in 2029. Demolition of the existing facilities within the existing TPSTW site boundary would commence in 2029 after completion of the New West Plant in the proposed expansion site. Assuming the Lubricant Oil Store within the existing TPSTW can be decommissioned in 2027, the tentative report submission schedule for the existing TPSTW (assuming that the land remediation works can be carried out off-site as needed) is as follows:

- Supplementary CAP for existing TPSTW – Mid 2027
- CAR and RAP for existing TPSTW – End 2027
- RR for existing TPSTW – End 2028

7 Conclusion

7.1.1 A site appraisal, in the form of desktop review and site walkover, had been carried out to identify the potential contaminative land uses and hotspots within the Study Area. Based on the site appraisal, 3 sites of recycling industries in the proposed expansion site of the Project Area and 1 facility (namely Lubricant Oil Store in existing TPSTW) within the Study Area are identified as potential land contamination sites.

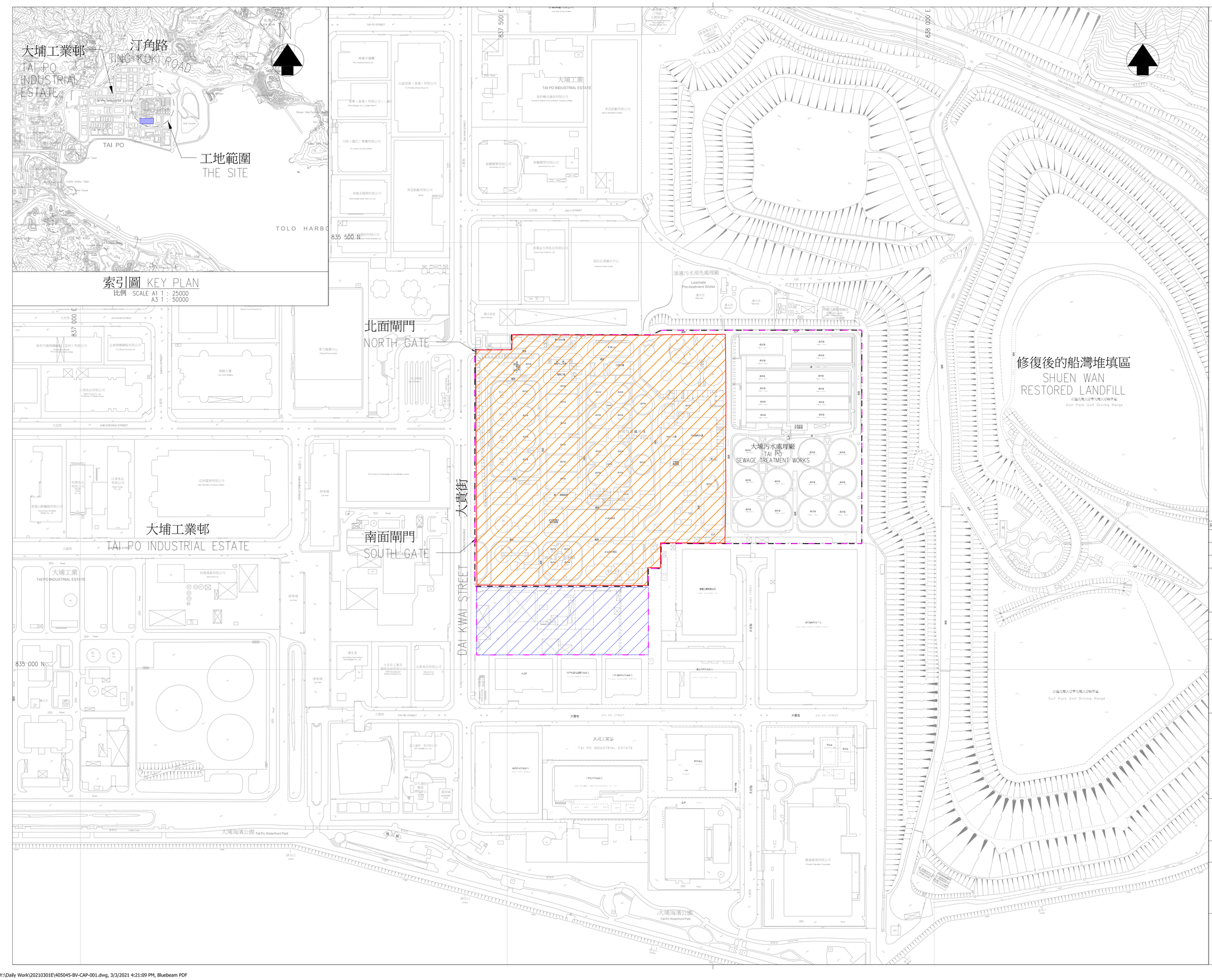
7.1.2 All the Study Area 's facilities are currently in operation and it would not be feasible to carry out the proposed SI works under the EIA Study. Therefore, the proposed SI work and any necessary remediation action are recommended to be carried out after decommissioning of the concerned facilities but prior to the construction works at the concerned areas.

7.1.3 Prior to commencement of the SI works, a review of this CAP should be conducted to prepare the sampling and testing program. Supplementary CAP(s), presenting findings of the review the latest site conditions and any updated sampling strategy and testing protocol, should be submitted to EPD for endorsement. The SI works should be carried out according to EPD's agreed supplementary CAP(s). Following completion of SI works and receipt of laboratory test results, CAR(s) should be prepared to present the findings of the SI works and to discuss the presence, nature and extent of contamination. If contamination is identified, RAP(s) which provides details of the remedial actions for the identified contaminated soil and / or groundwater should be endorsed by EPD. Remediation action, if required, will be carried out according to the endorsed RAP(s) and RR(s) demonstrating the completion of remediation works at the identified contaminated area(s) (if any) will be prepared and submitted to EPD for approval. The RR(s) should be completed prior to the commencement of construction works at the respective identified contaminated area(s).

7.1.4 With the implementation of the aforementioned follow up works for the Project, any soil/groundwater contamination would be identified and properly treated prior to the construction works. No insurmountable land contamination impacts to the Project are therefore anticipated.

FIGURES

A3



LEGEND:

- PROJECT BOUNDARY
- EXISTING SITE BOUNDARY OF TAI PO SEWAGE TREATMENT WORKS
- PROPOSED UPGRADING WORKS WITHIN EXISTING TAI PO SEWAGE TREATMENT WORKS
- PROPOSED EXPANSION SITE

Revision	Date	Description		Initial
	Designed	Checked	Drawn	Checked
Initial	–	–	–	–
Date	05/20	05/20	05/20	05/20

Approved

Agreement no.
CE 50/2019 (DS)

Project title
UPGRADING OF TAI PO SEWAGE TREATMENT WORKS – INVESTIGATION

Drawing title
PROJECT LOCATION PLAN

Drawing no.
FIGURE 1.1

Revision
–

Scale
A1 1 : 2000
A3 1 : 4000

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

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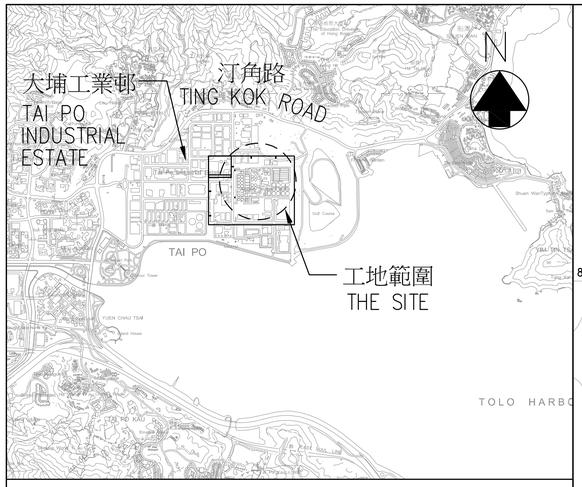
A3



索引圖 KEY PLAN
比例 SCALE A1 1 : 25000
A3 1 : 50000

LEGEND:

- PROJECT BOUNDARY
- EXISTING SITE BOUNDARY OF TAI PO SEWAGE TREATMENT WORKS
- PROPOSED EXCAVATION WORKS BOUNDARY

Revision	Date	Description			Initial
	Designed	Checked	Drawn		Checked
Initial	–	–	–		–
Date	05/20	05/20	05/20		05/20

Approved

Agreement no.
CE 50/2019 (DS)

Project title
UPGRADING OF TAI PO SEWAGE TREATMENT WORKS – INVESTIGATION

Drawing title
PROPOSED EXCAVATION WORKS BOUNDARY

Drawing no.
FIGURE 1.2

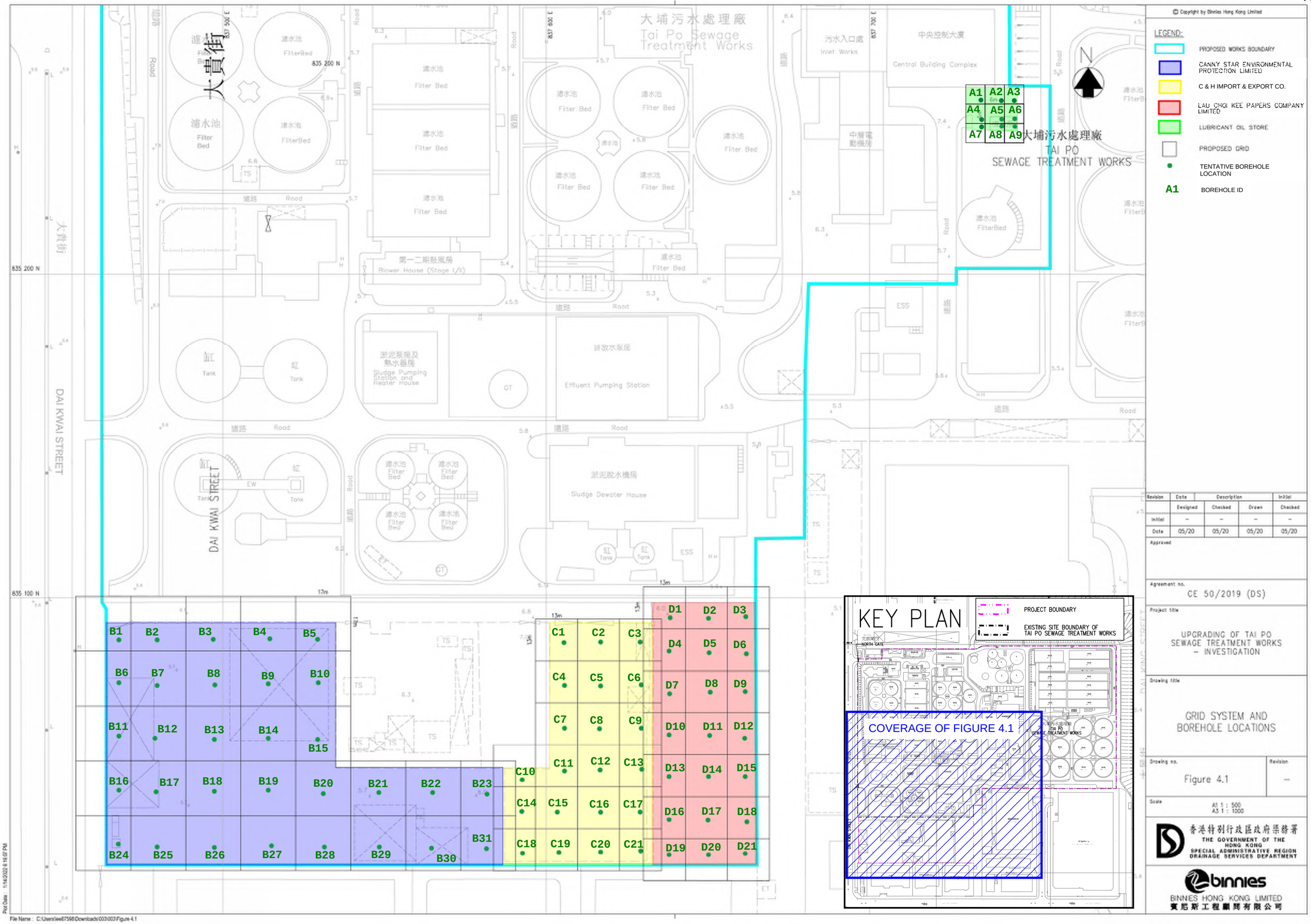
Revision
–

Scale
A1 1 : 1000
A3 1 : 2000

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

A3



Revision	Date	Description			Initial
	Designed	Checked	Drawn	Checked	
Initial	–	–	–	–	
Date	05/20	05/20	05/20	05/20	

Approved

Agreement no.
CE 50/2019 (DS)

Project title
UPGRADING OF TAI PO SEWAGE TREATMENT WORKS – INVESTIGATION

Drawing title
GRID SYSTEM AND BOREHOLE LOCATIONS

Drawing no.
Figure 4.1

Revision
–

Scale
A1 1 : 500
A3 1 : 1000

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT

BINNIES HONG KONG LIMITED
賓尼斯工程顧問有限公司

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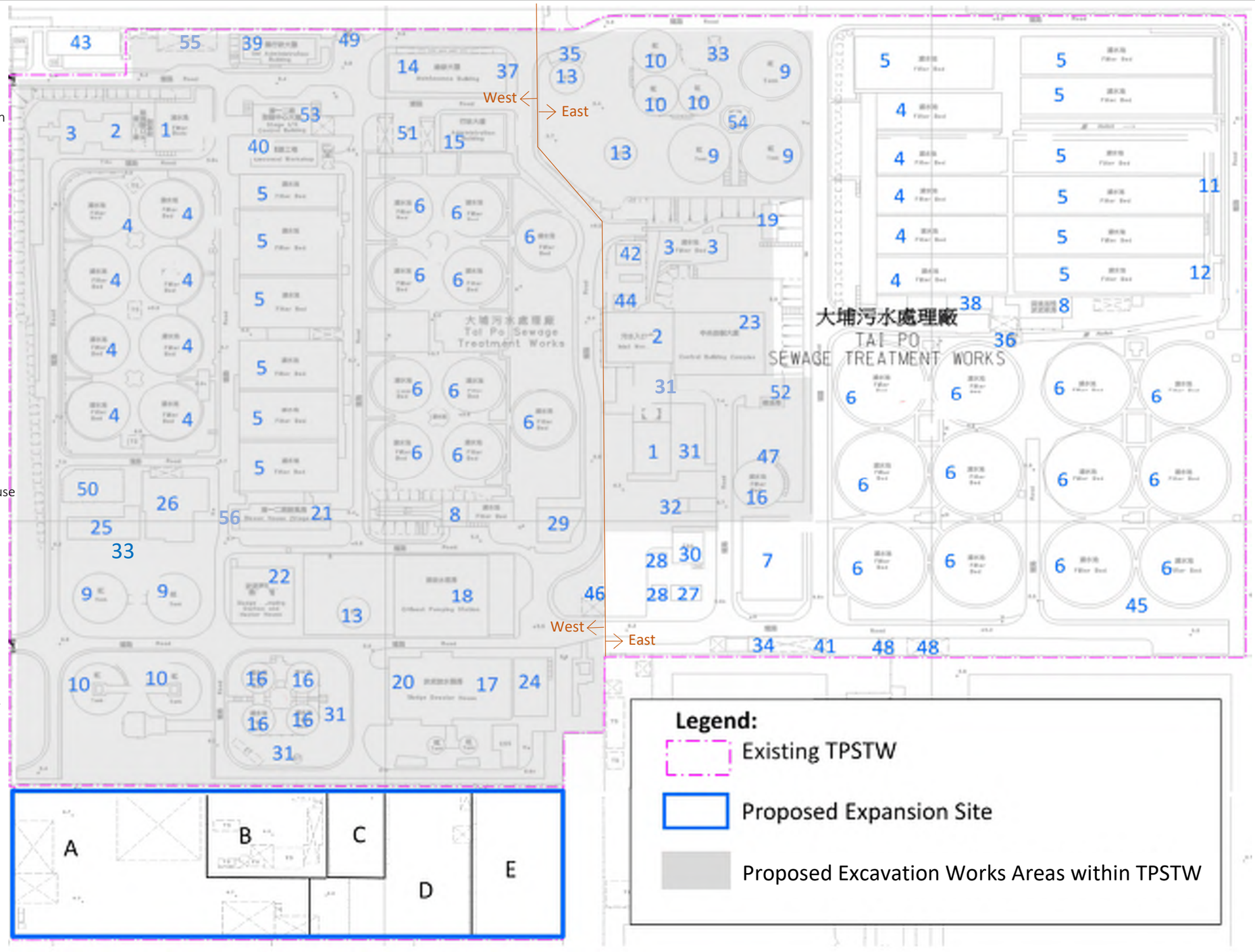
File Name : C:\Users\lee87598\Downloads\003\003\Figure 4.1

ANNEX 2.1A

EXISTING TPSTW LAYOUT

Legend:

1. Inlet pumping station
2. Screen house
3. Detritors
4. Primary sedimentation tank
5. Aeration tank
6. Final clarifier (or final sedimentation tank)
7. SAS thickening house
8. Return activated sludge pumping station
9. Sludge digestion tank
10. Sludge consolidation tank
11. Mixed liquor channel
12. Foam removal chamber
13. Bio-gas holding tank
14. Maintenance Building
15. Administration Building
16. Primary sludge gravity thickener
17. Chemical house
18. Effluent pumping station
19. Primary sedimentation tank distribution chamber
20. Sludge dewatering house
21. Blower house
22. Sludge pumping station
23. Central building complex
24. Extension of sludge dewatering house
25. Filtrate treatment complex
26. Filtrate treatment units
27. Fire services shelter
28. Water tank
29. UV disinfection facilities
30. Transformer house
31. Combined heat and power generation system
32. Chemical store
33. Ferric Chloride dosing system
34. Water treatment system
35. Bio-gas holding tank valve chamber
36. Flow splitter box
37. Flower bed
38. Switch room
39. Old Administration Building
40. Electrical Workshop
41. Storage facilities
42. Waste bio-gas burner
43. Non-residential Staff Building
44. Gas transfer station
45. Washout chamber
46. Effluent Sampling Shelter
47. Decanting chamber
48. Storage shelter
49. Dangerous Goods Store
50. Waste storage area
51. Car Park
52. Lubricant Oil Store
53. Control and Storage House
54. Service Tower Building
55. Workshop
56. Transformer

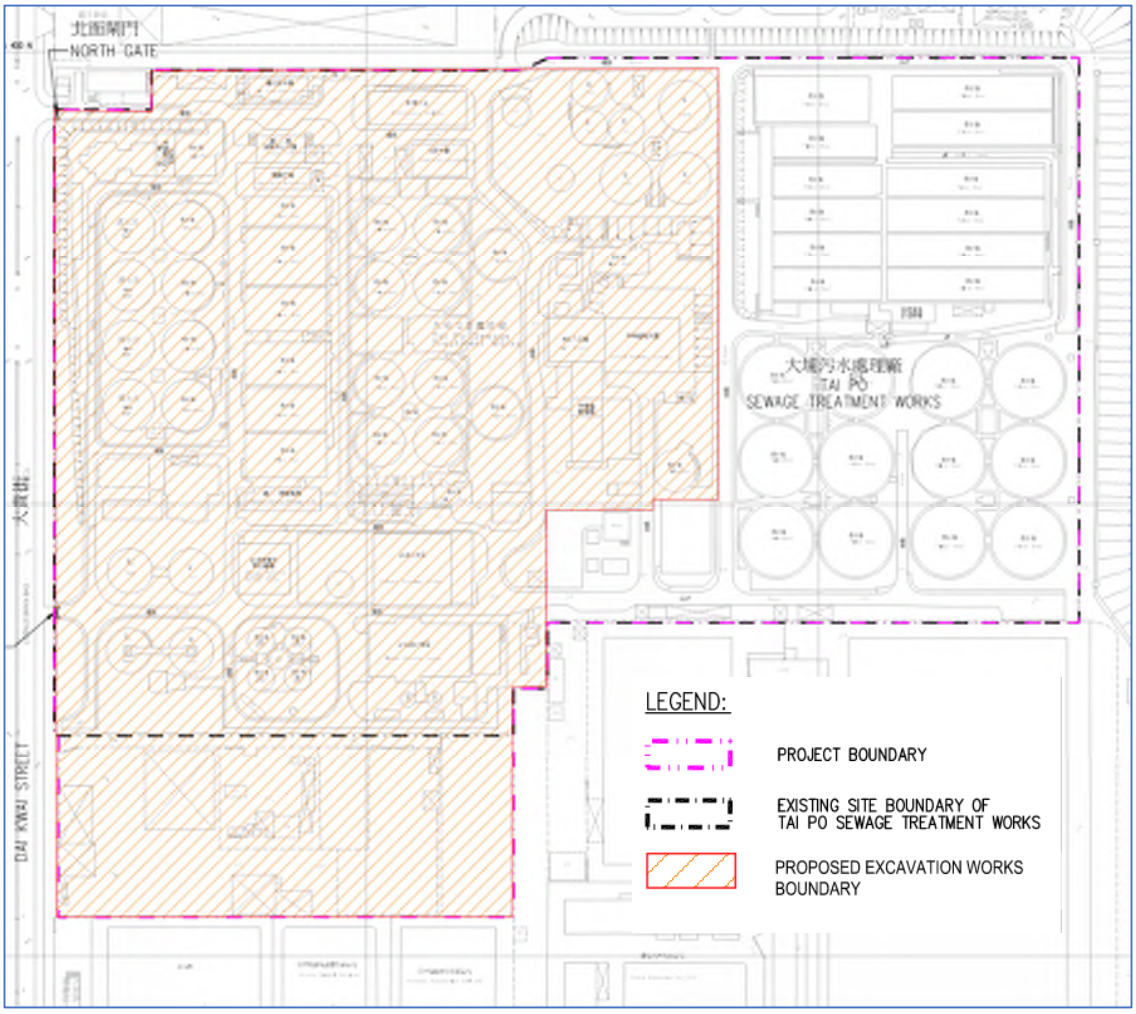


A. Lot No. STT 1449 – Existing Canny Star Environmental Protection Ltd.
B. Lot No. GLA-TPP 776 – Existing DSD's and Contractor's Site Office
C. Existing Vacant land (Previously Lot No. GLA-TPP 786 – CEDD's Site Office)
D. Lot No. STT 1450 – Existing C & H Import and Export Company
E. Lot No. STT 1745 – existing Lau Choi Kee Papers Company Ltd.

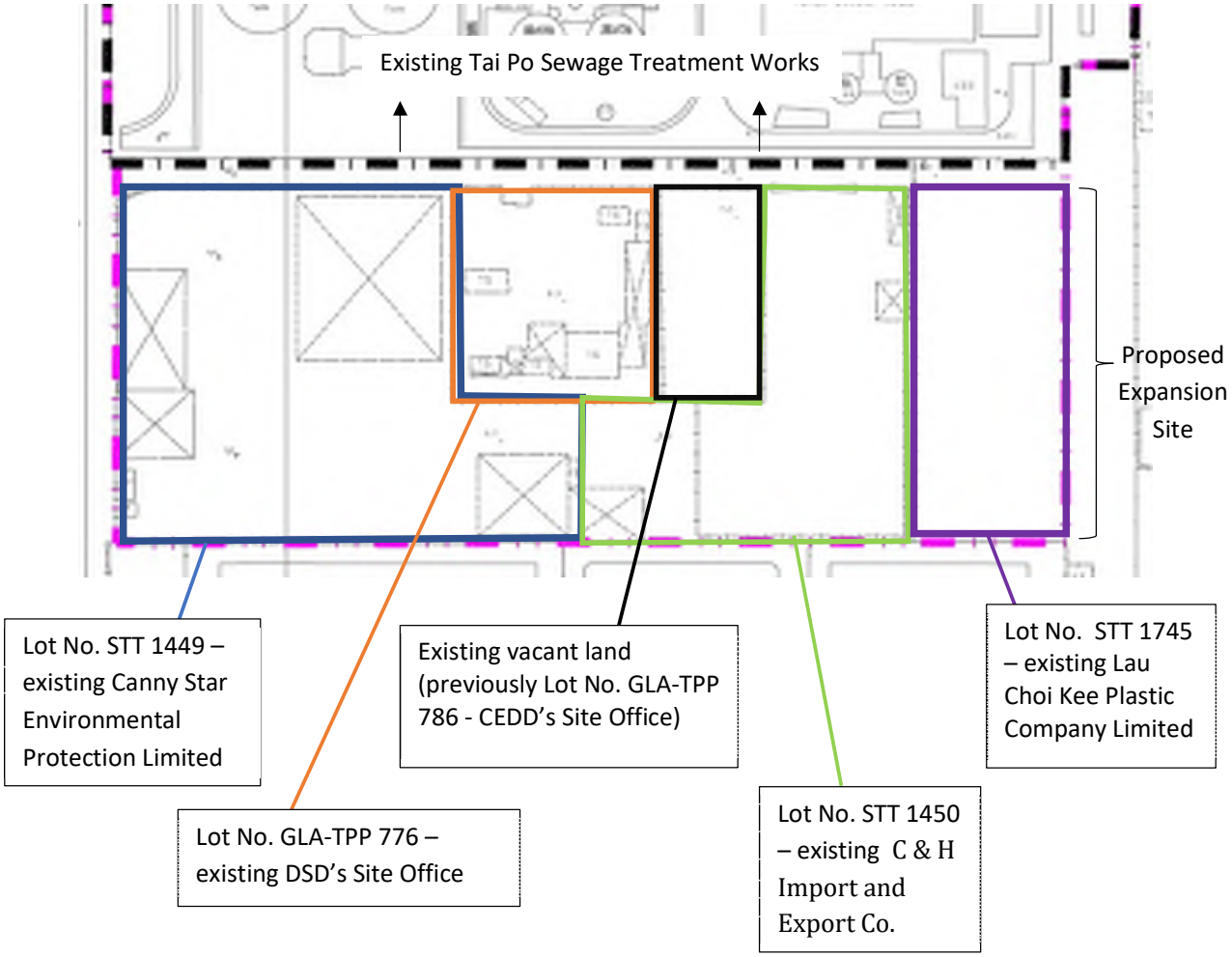
ANNEX 2.1

SELECTED AERIAL PHOTOGRAPHS

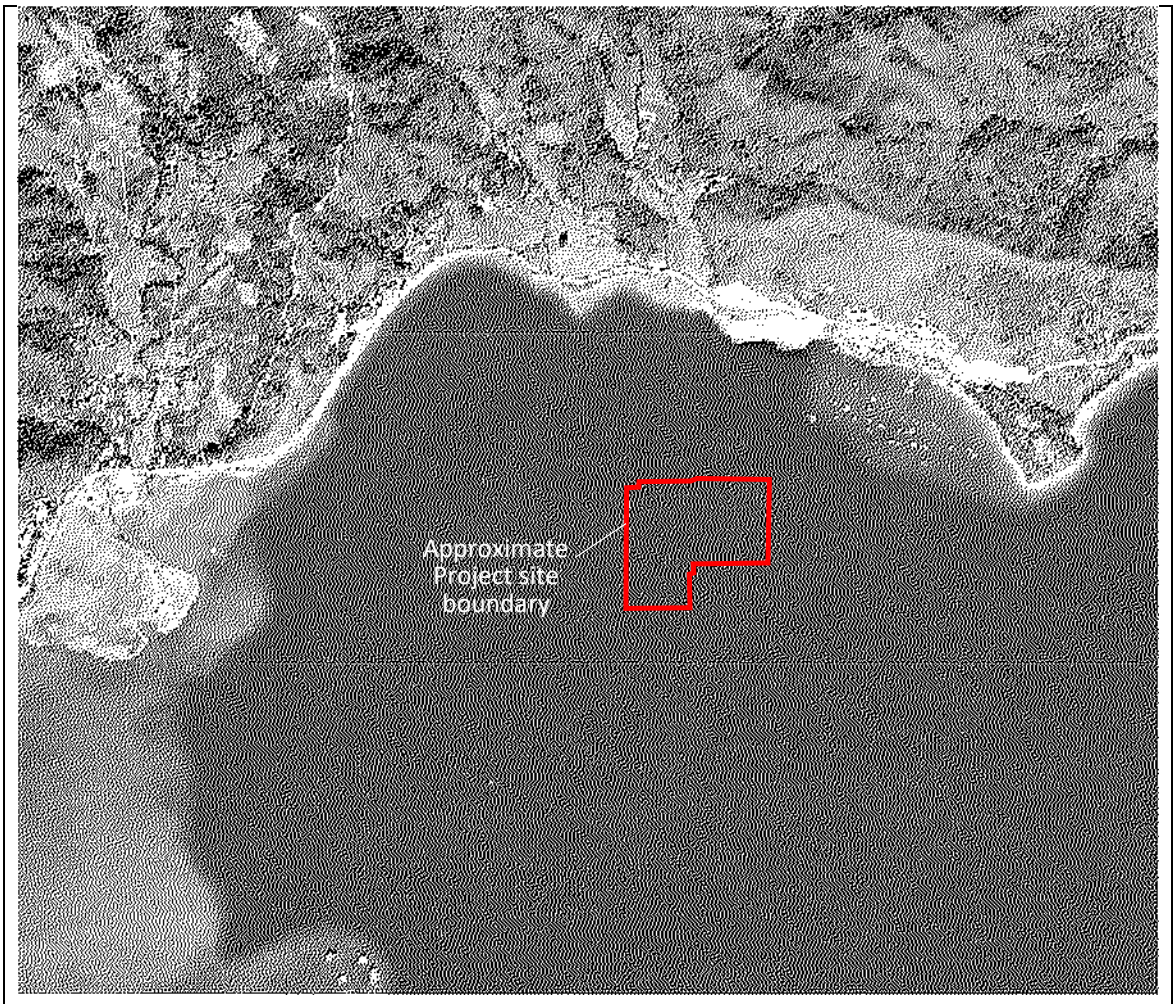
Project Site



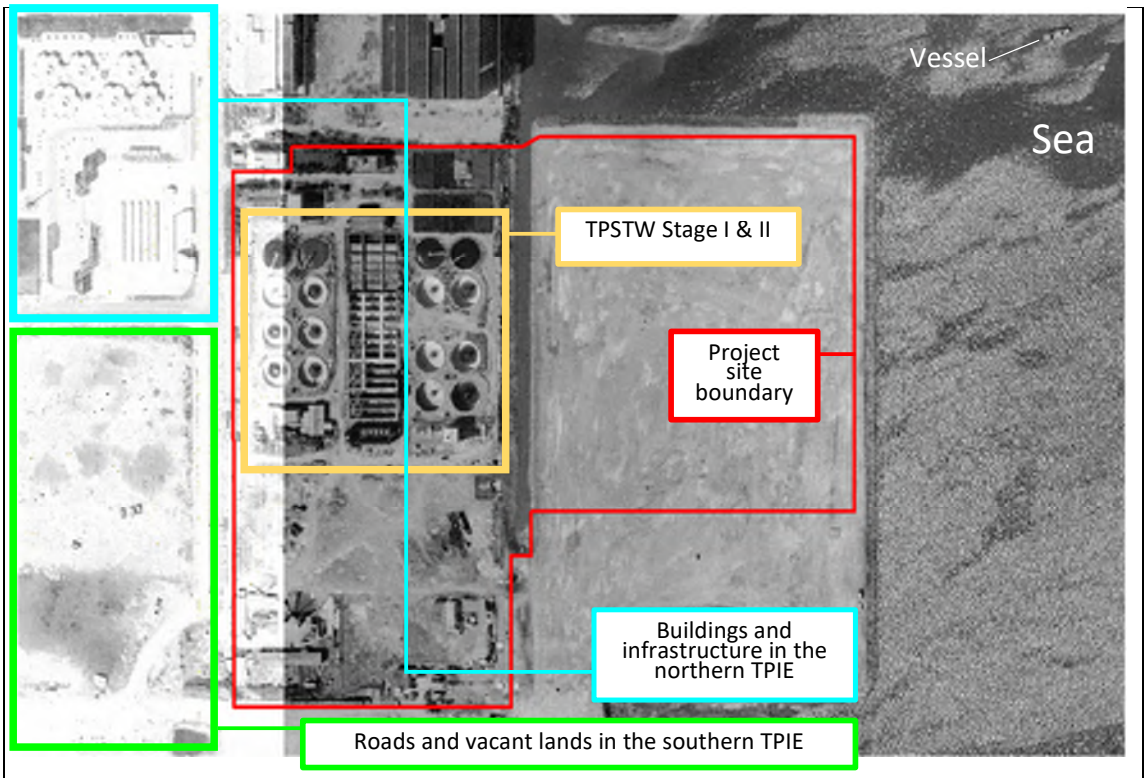
Temporary Government Land Allocation (GLA) and Short Term Tenancies (STT) in the Proposed Expansion Site



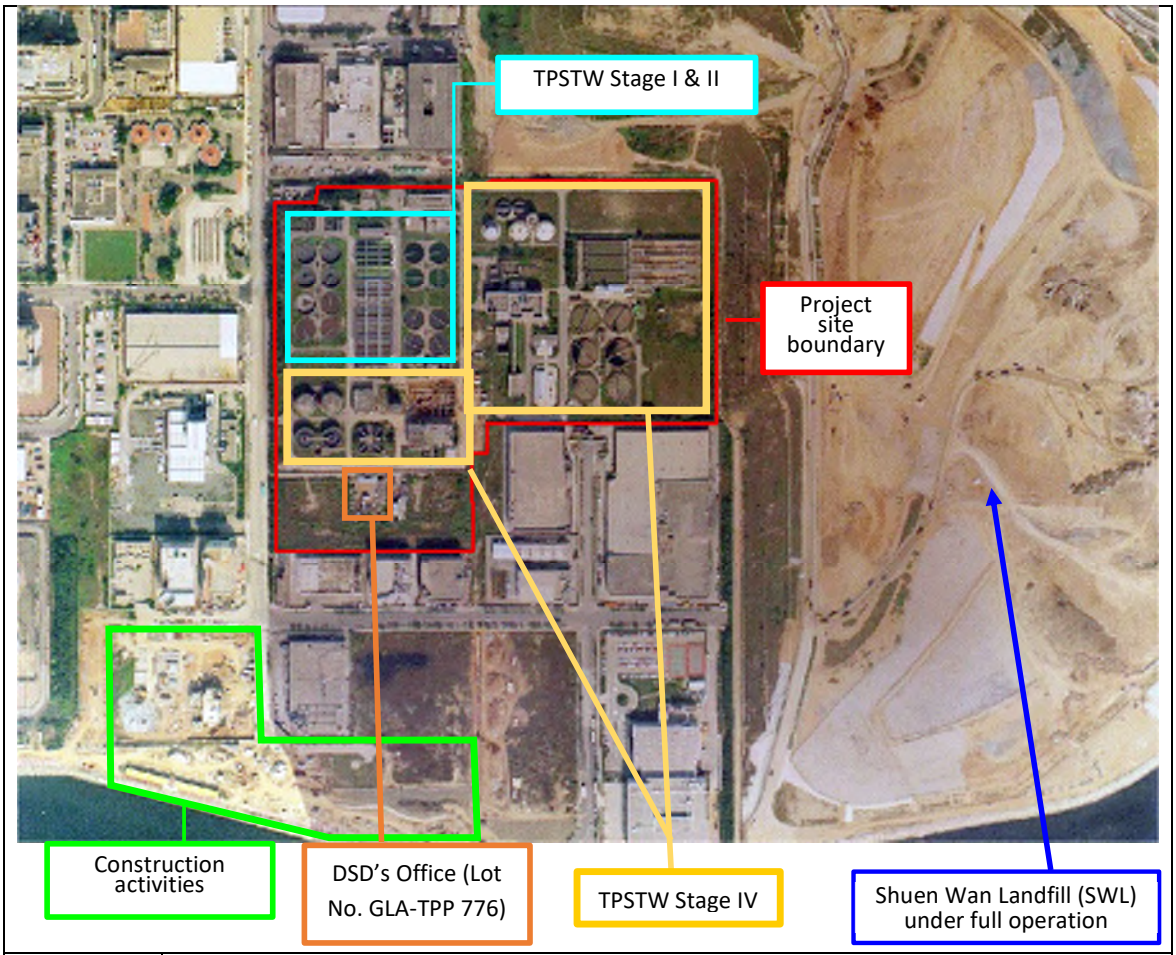
Year:	1945
Remarks:	<u>Project Site</u> 1. The location of the Project site, including the existing Tai Po Sewage Treatment Works (TPSTW) and the proposed expansion site, was the sea. <u>Surrounding Off-site Areas</u> 2. The surrounding off-site areas, including the present Tai Po Industrial Estate (TPIE) and the Shuen Wan Restored Landfill (SWRL), were still the sea. No reclamation is found.



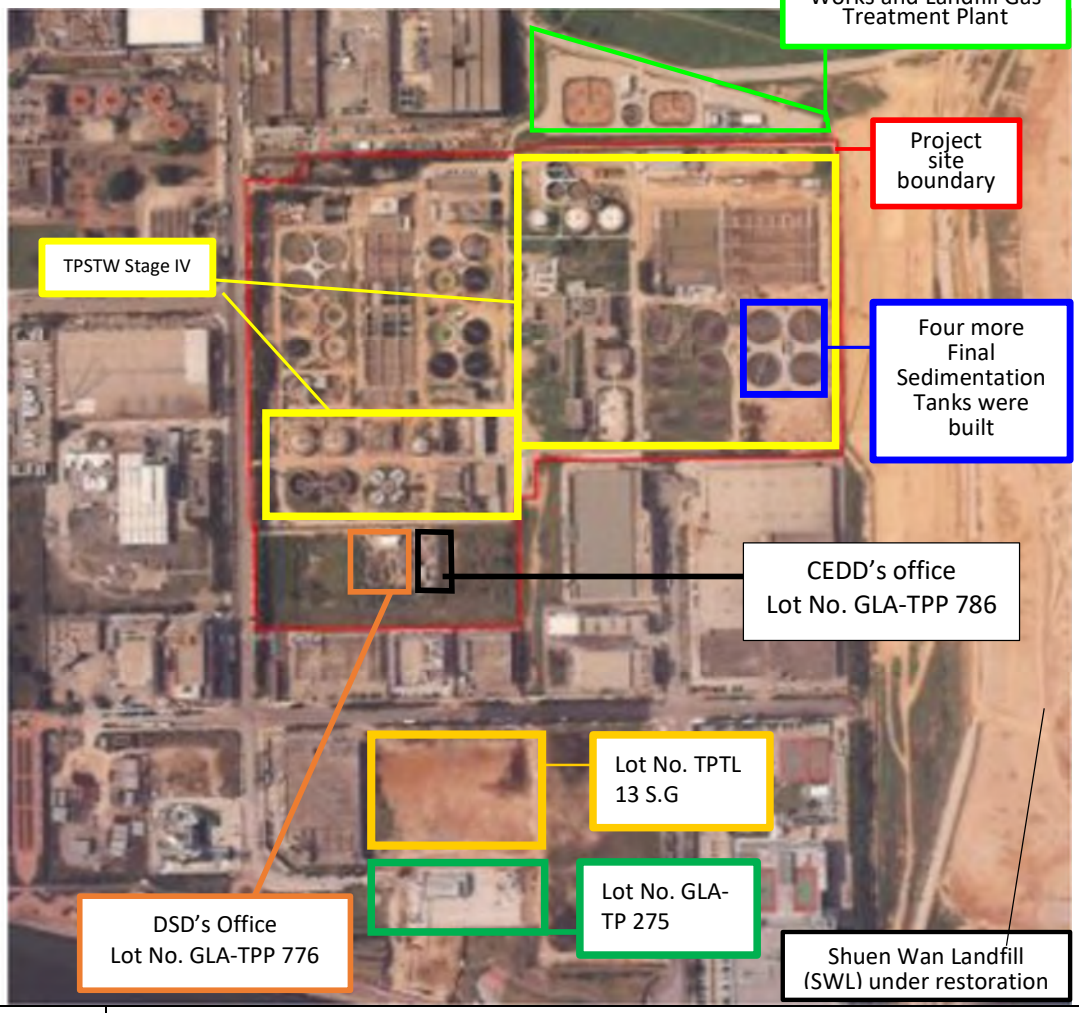
Year:	1973
Remarks:	<u>Project Site</u> 1. No reclamation is found. 2. The land within the Project site was not yet formed. <u>Surrounding Off-site Areas</u> 3. The areas immediately around the Project site were also the sea.



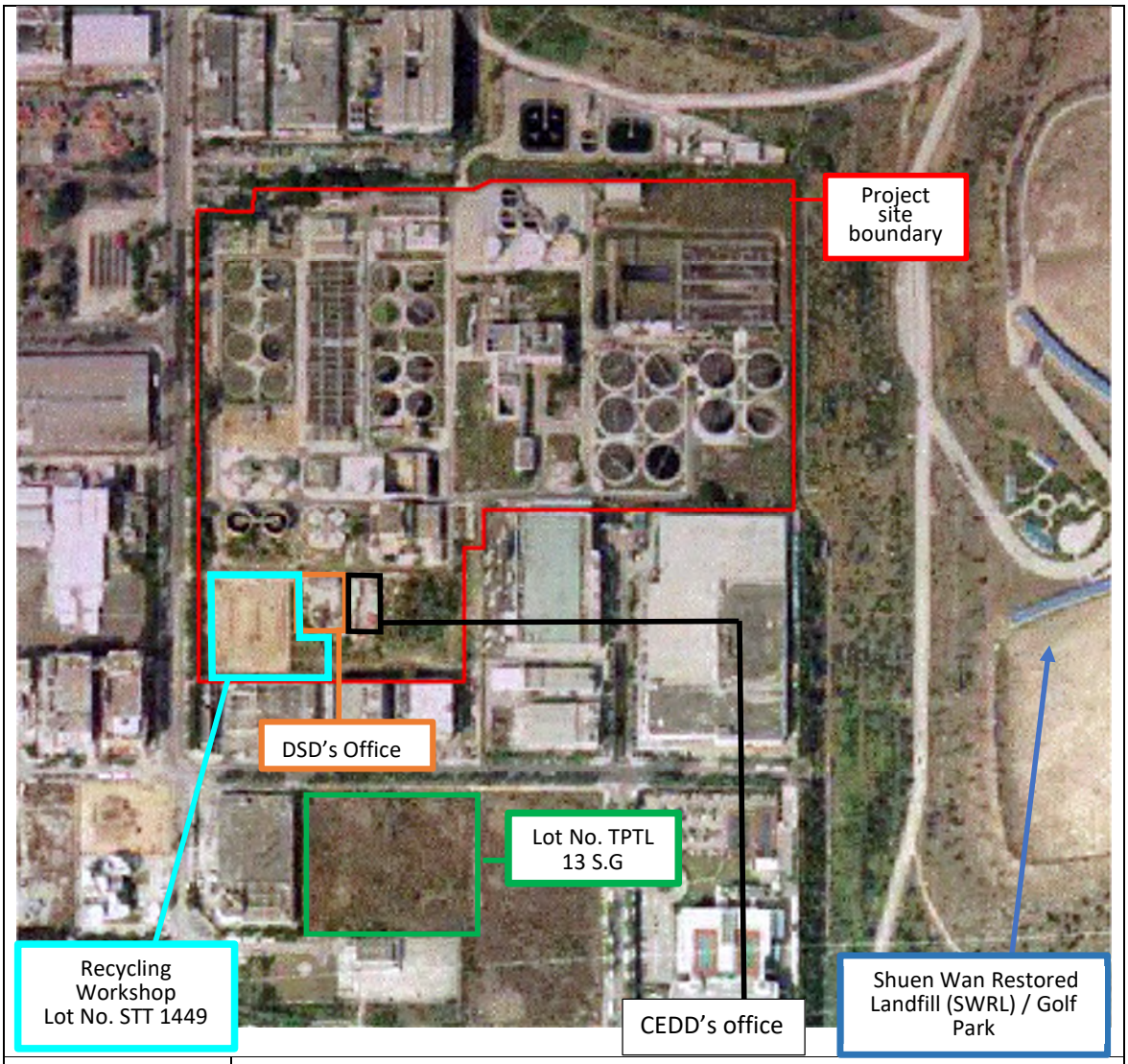
Year:	1982
Remarks:	<u>Project Site</u> 1. Land formation/ reclamation in the Project site was completed. 2. TPSTW Stage I was in operation. 3. Construction of TPSTW Stage II was in progress. 4. A small amount of construction equipment / facilities is observed in the southern area of the Project site. 5. The remaining areas of the Project Site were vacant lands. <u>Surrounding Off-site Areas</u> 6. Most of the reclaimed lands within the existing TPIE site were formed. 7. Area to the east of the Project site (within the boundary of the present Shuen Wan Restored Landfill (SWRL) site) was still the sea. Shuen Wan Landfill (SWL) should be in operation in the north, further away from the Project site. 8. Buildings and infrastructure in the northern TPIE were formed. 9. The southern area of the existing TPIE site were mainly roads and vacant lands or still under reclamation.



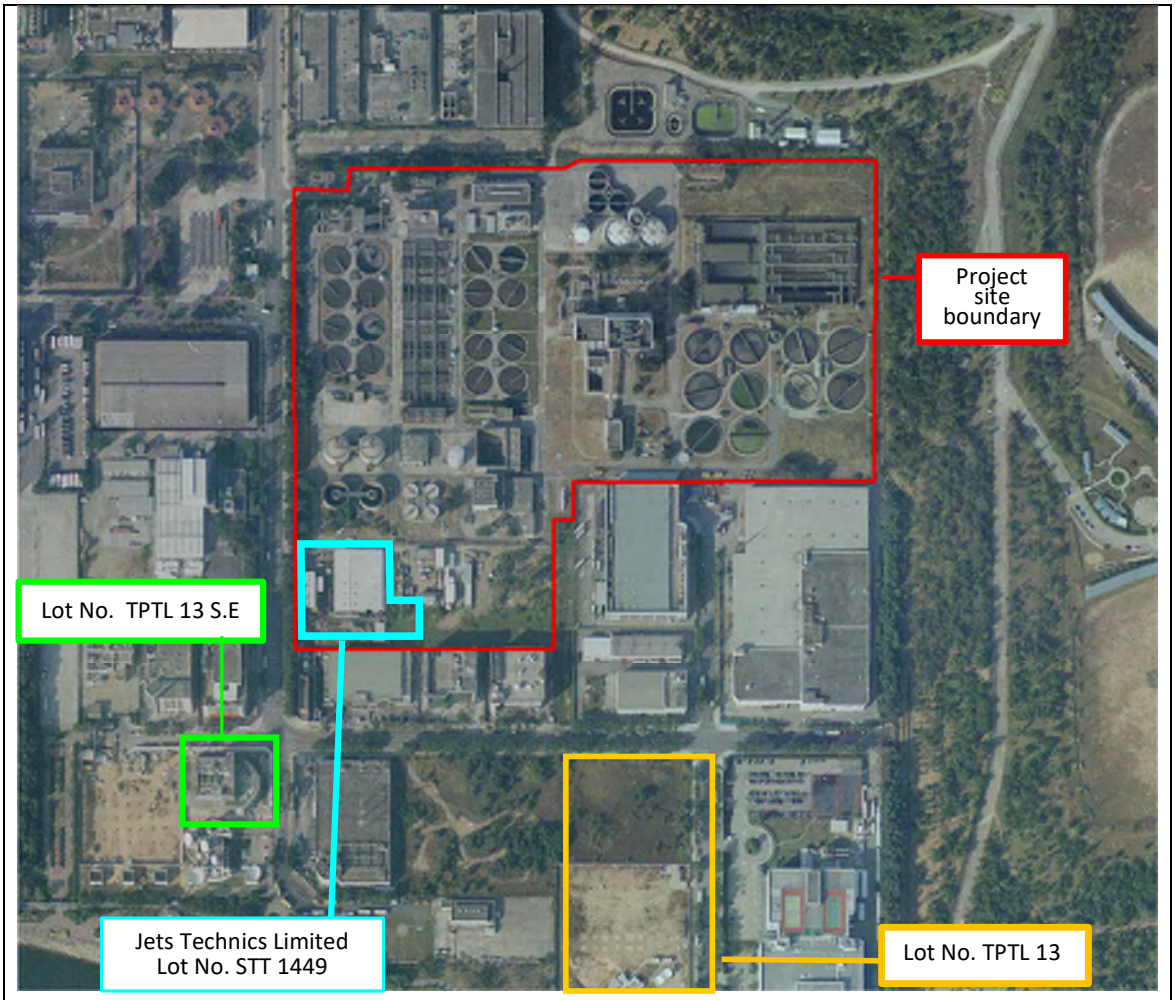
Year:	1993
Remarks:	<u>Project Site</u> 1. TPSTW Stage I and Stage II were in operation. 2. TPSTW Stage IV (covering most of the remaining areas of the present TPSTW site) was under construction 3. A DSD's office was being formed in the proposed expansion site (in Lot No. GLA-TPP 776). 4. The remaining areas of the proposed expansion site were not yet occupied and mostly vegetated. <u>Surrounding Off-site Areas</u> 5. SWL was under full operation. 6. Reclamation for TPIE was fully completed. 7. Industrial buildings were developed around the Project site. 8. Some construction activities were taking place in the southern TPIE near the waterfront.



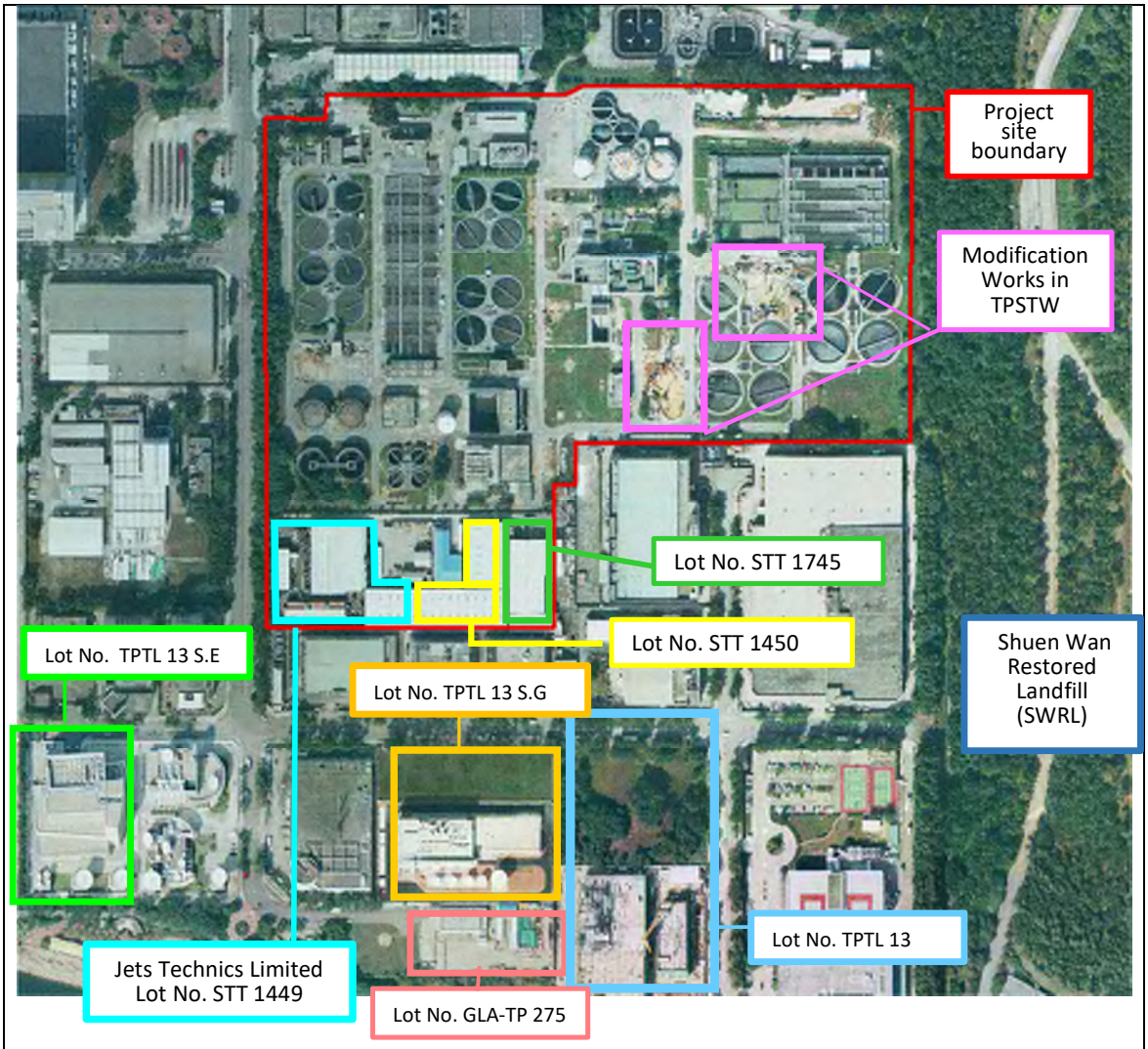
Year:	1996
Remarks:	<u>Project Site</u> 1. TPSTW Stage IV was completed and in operation. 2. Four more Final Sedimentation Tanks were built in the east part of TPSTW. 3. The DSD's office in the proposed expansion site was in operation. 4. A CEDD's office was being formed in Lot No. GLA-TPP 786 (next to the DSD's office). 5. No obvious changes for other Project areas <u>Surrounding Off-site Areas</u> 6. The construction works previously observed near the waterfront were completed. 7. A new building was formed in the southern TPIE (in Lot No. GLA-TP 275) 8. Some vegetation previously observed in the southern TPIE (Lot No. TPTL 13 S.G) was removed. 9. SWL Leachate Pre-treatment Works (LPW) and Landfill Gas Treatment Plant were built to the north of the TPSTW. 10. SWL (to the east of the Project site) was closed and under restoration 11. No obvious changes in other off-site areas.



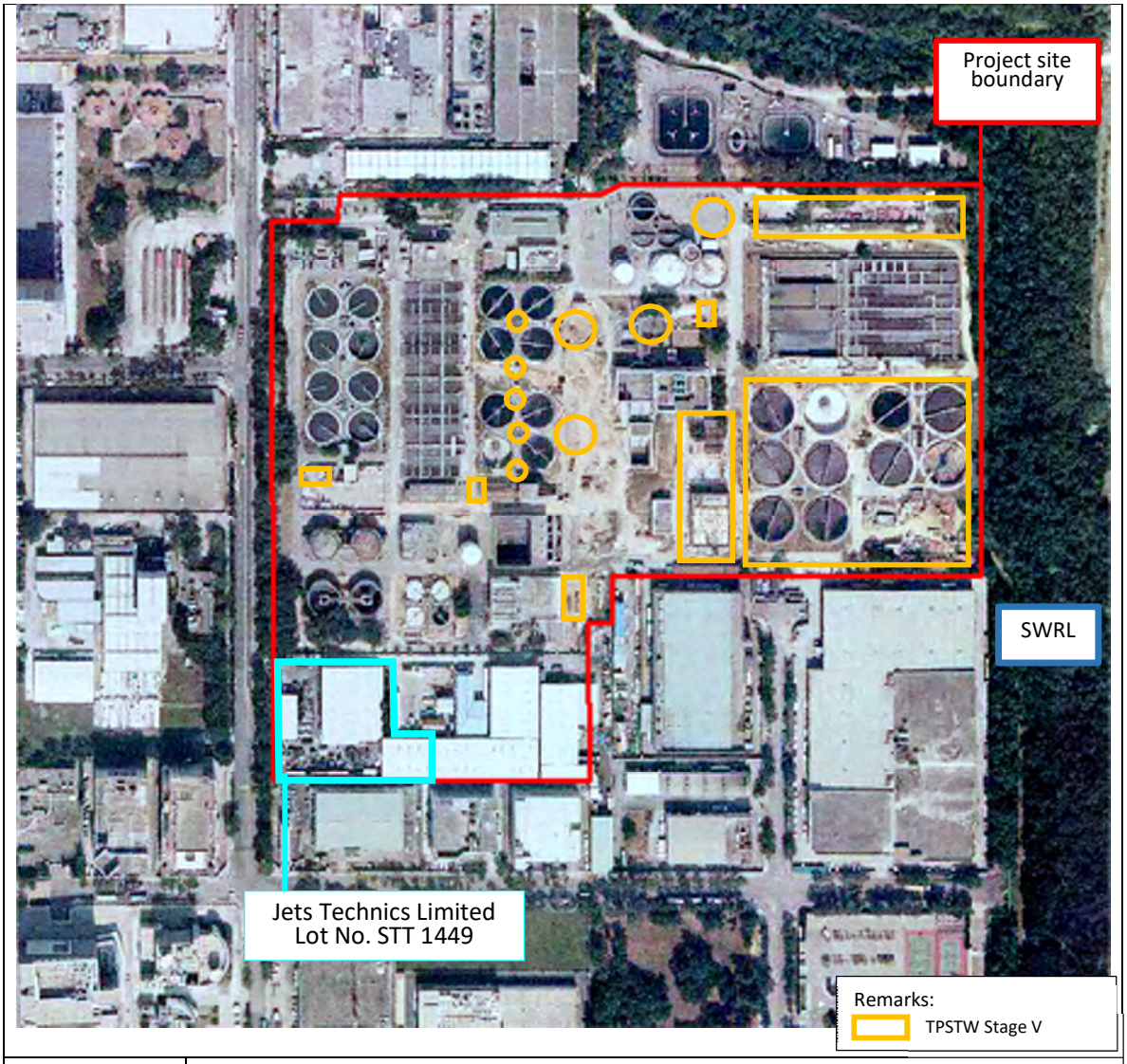
Year:	2000
Remarks:	<u>Project Site</u> 1. A recycling workshop was under construction in the west part of the proposed expansion site (in Lot STT 1449). 2. The CEDD's office in the proposed expansion site (in Lot No. GLA-TPP 786 next to the DSD's office) was in operation. 3. No obvious changes for the other Project areas. <u>Surrounding Off-site Areas</u> 4. The SWRL started to serve as a 145-bay golf driving range for public use. 5. The area (in Lot No. TPTL 13 S.G) in the southern TPIE (previously observed to have exposed soil surface) was vegetated again. 6. No obvious changes in other off-site areas.



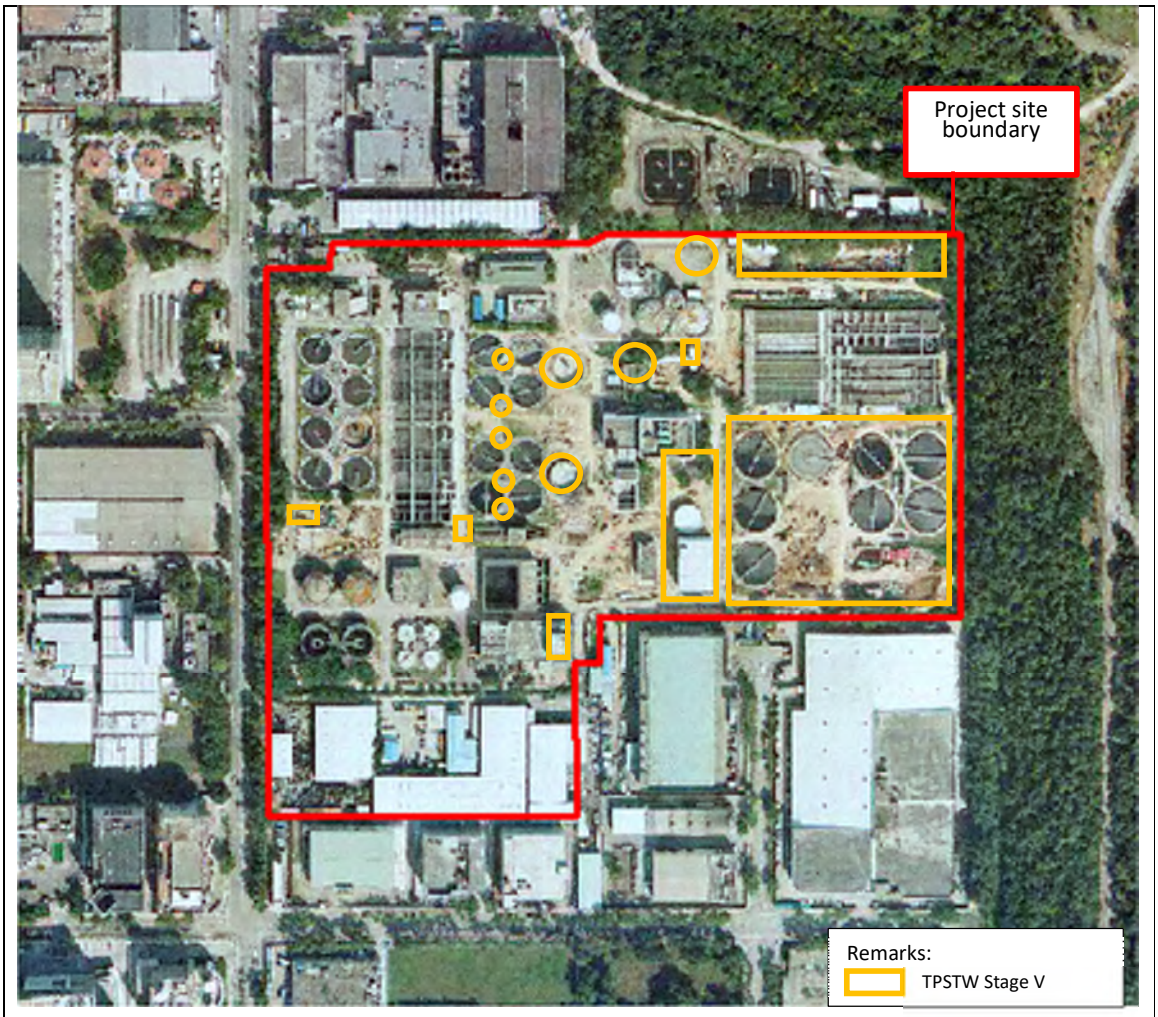
Year:	2003
Remarks:	<u>Project Site</u> 1. According to the Short Term Tenancy (STT) record of Lands Department, Jets Technics Limited (a business in connection with the recovery and recycling of waste materials found in municipal solid waste) was in operation in the west part of the proposed expansion site (in Lot No. STT 1449) since 2003. 2. No obvious changes for other Project areas <u>Surrounding Off-site Areas</u> 3. Lot No. TPTL 13 near the waterfront of TPIE was under construction. 4. New buildings were formed in Lot No TPTL 13 S.E in the southern TPIE. 5. No obvious changes in other off-site areas.



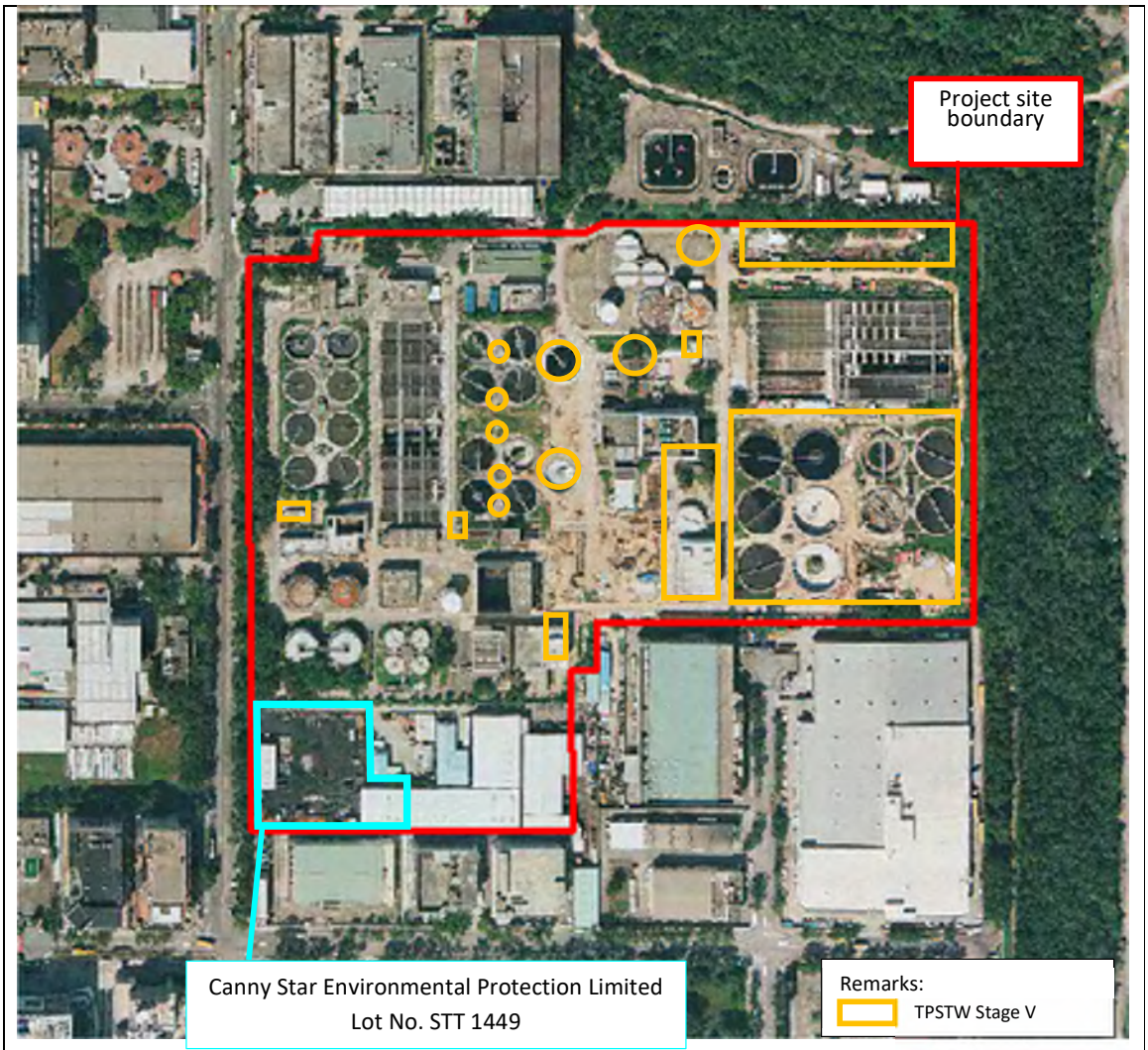
Year:	2005
Remarks:	<u>Project Site</u> 1. Some modification works in the central and eastern areas of TPSTW were observed. 2. More shelters were built in the area of Jets Technics Limited. 3. Temporary structures were found in the eastern lots of the proposed expansion site (in Lot No. STT 1450 and Lot No. 1745). Lands Department has no record of STT at these lots. Occupant information is unknown. Recycling industries were likely operated in these lots. 4. No obvious changes for other Project areas <u>Surrounding Off-site Areas</u> 5. New buildings were formed in the southern TPIE (in Lot No. TPTL 13 S.E, Lot No. TPTL 13 S.G, Lot No. GLA TP-275 and Lot No. TPTL 13). 6. More plantation were observed Lot No. TPTL 13 and in the SWRL. 7. No obvious changes in other off-site areas.



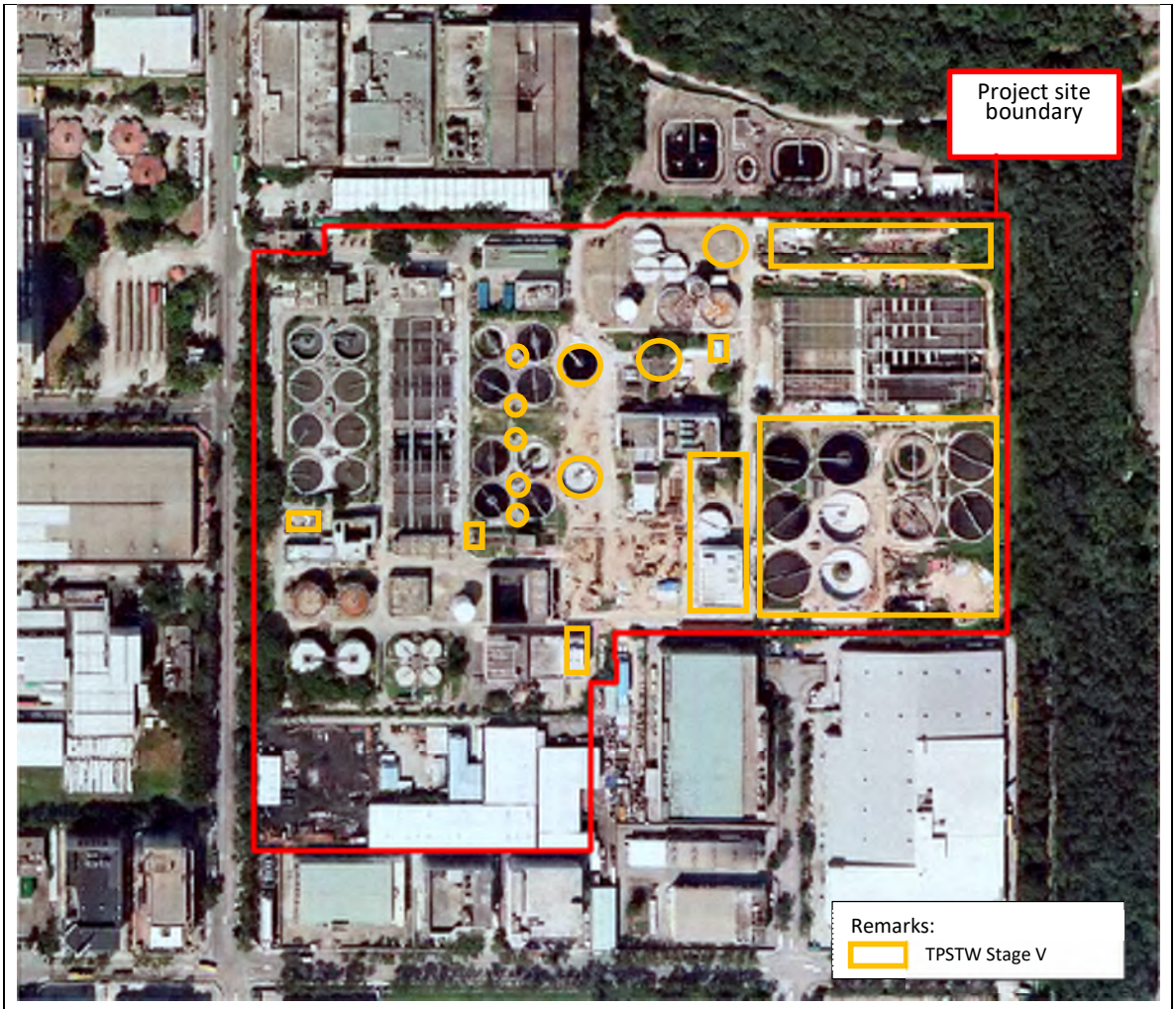
Year:	2006
Remarks:	<u>Project Site</u> 1. Construction of TPSTW Stage V was in progress. 2. One of the shelters of Jets Technics Limited (Lot No. STT 1449) in the proposed expansion site was demolished. 3. No obvious changes in other Project areas <u>Surrounding Off-site Areas</u> 4. Dense plantation is observed in the SWRL. 5. No obvious changes in the other off-site area.



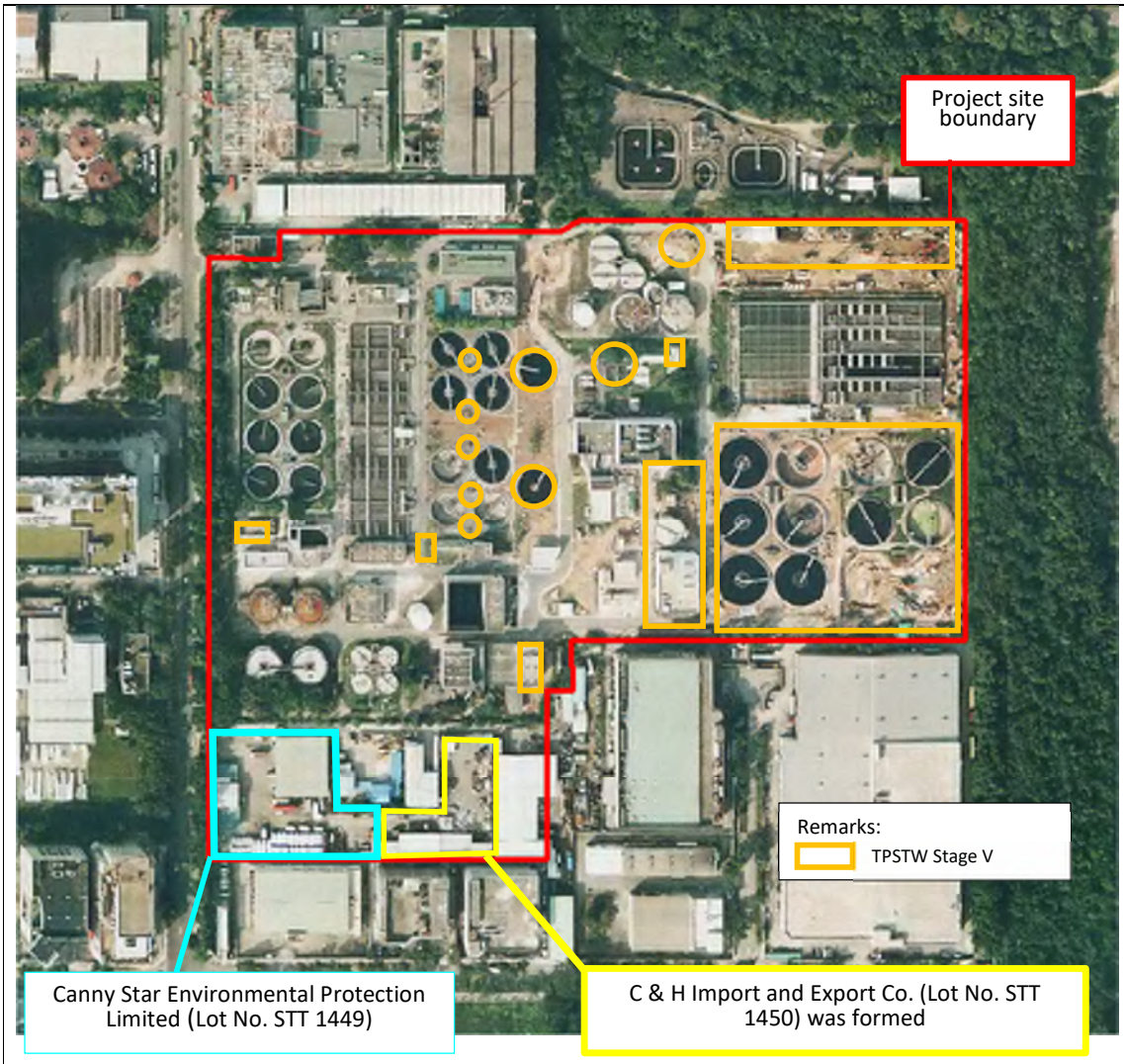
Year:	2007
Remarks:	<u>Project Site</u> 1. Construction of TPSTW Stage V continued. 2. No obvious change in other Project areas. <u>Surrounding Off-site Areas</u> 3. No obvious changes for all surrounding off-site areas.



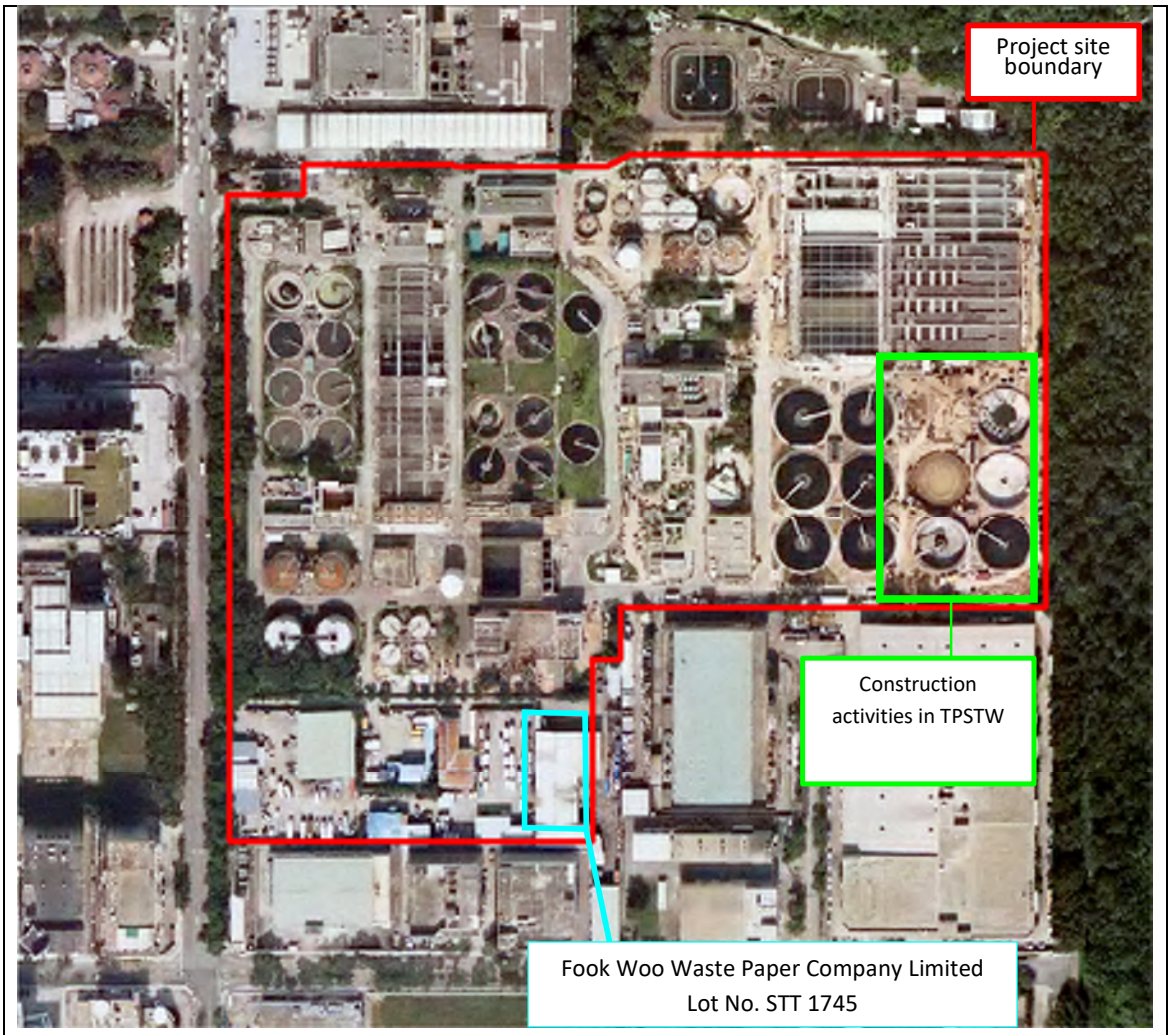
Year:	2009
Remarks:	<u>Project Site</u> 1. Construction of TPSTW Stage V continued. 2. According to the STT record of Lands Department, Canny Star Environmental Protection Limited was in operation in the west part of the proposed expansion site (in Lot No. STT 1449) since 2009. It was a business in the recovery and recycling of metals, paper, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood or furniture or any combination of the above found in municipal solid waste. 3. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 4. No obvious changes for all surrounding off-site areas..



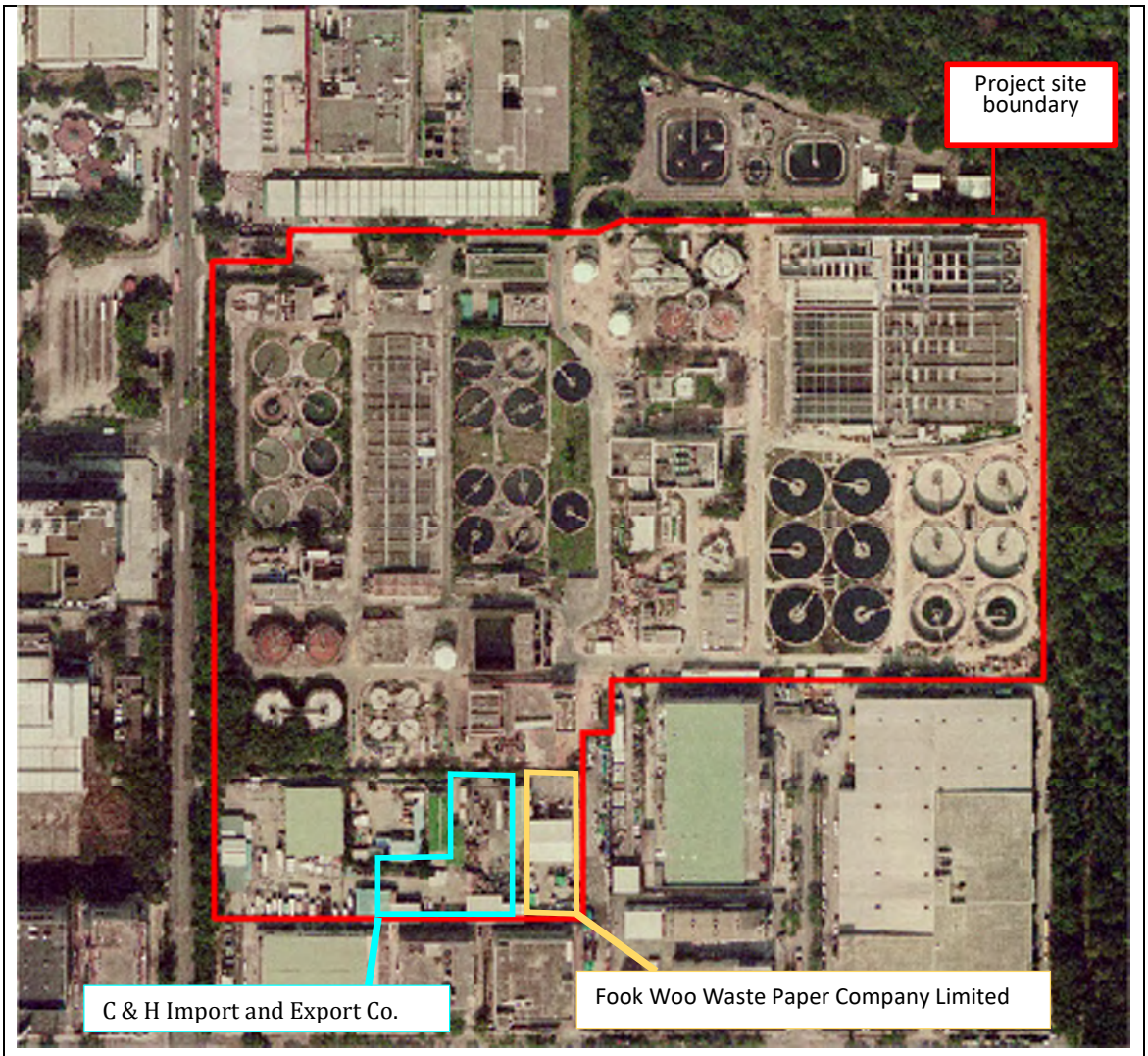
Year:	2011
Remarks:	<u>Project Site</u> 1. Phase 1 of TPSTW Stage V was completed and in operation. 2. Construction of TPSTW Stage V (Phase 2) continued 3. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 4. No obvious changes for all surrounding off-site areas.



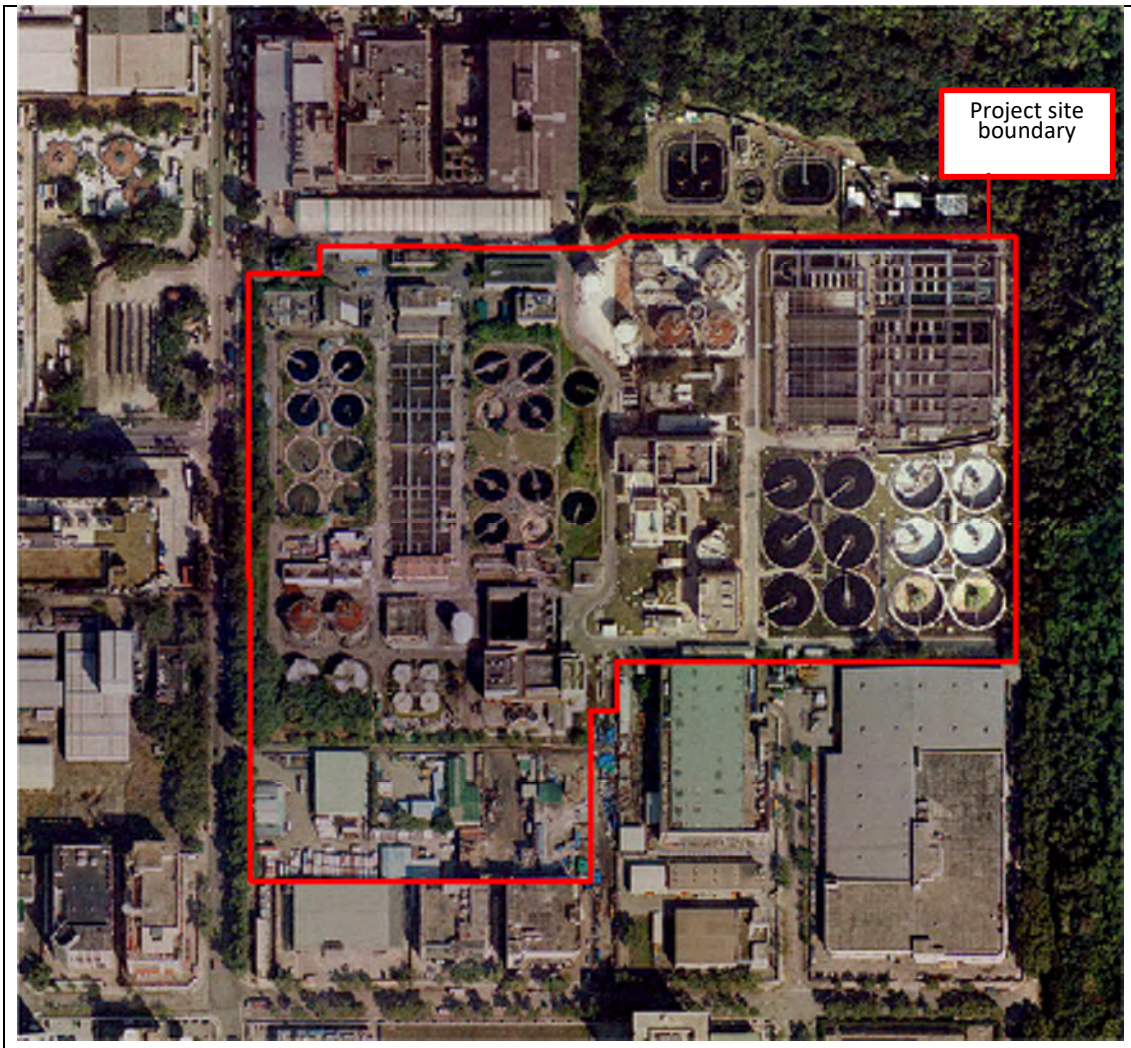
Year:	2012
Remarks:	<u>Project Site</u> 1. Construction of TPSTW Stage V (Phase 2) continued. 2. A shelter was built in the site of Canny Star Environmental Protection Limited in the west part of the proposed expansion site (in Lot No. STT 1449). 3. C & H Import and Export Co. was operated in the east part of the proposed expansion site (in Lot No. 1450). It was a steel recycling workshop and steel warehouse for storage of wasted steel. 4. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 5. No obvious changes for all surrounding off-site areas.



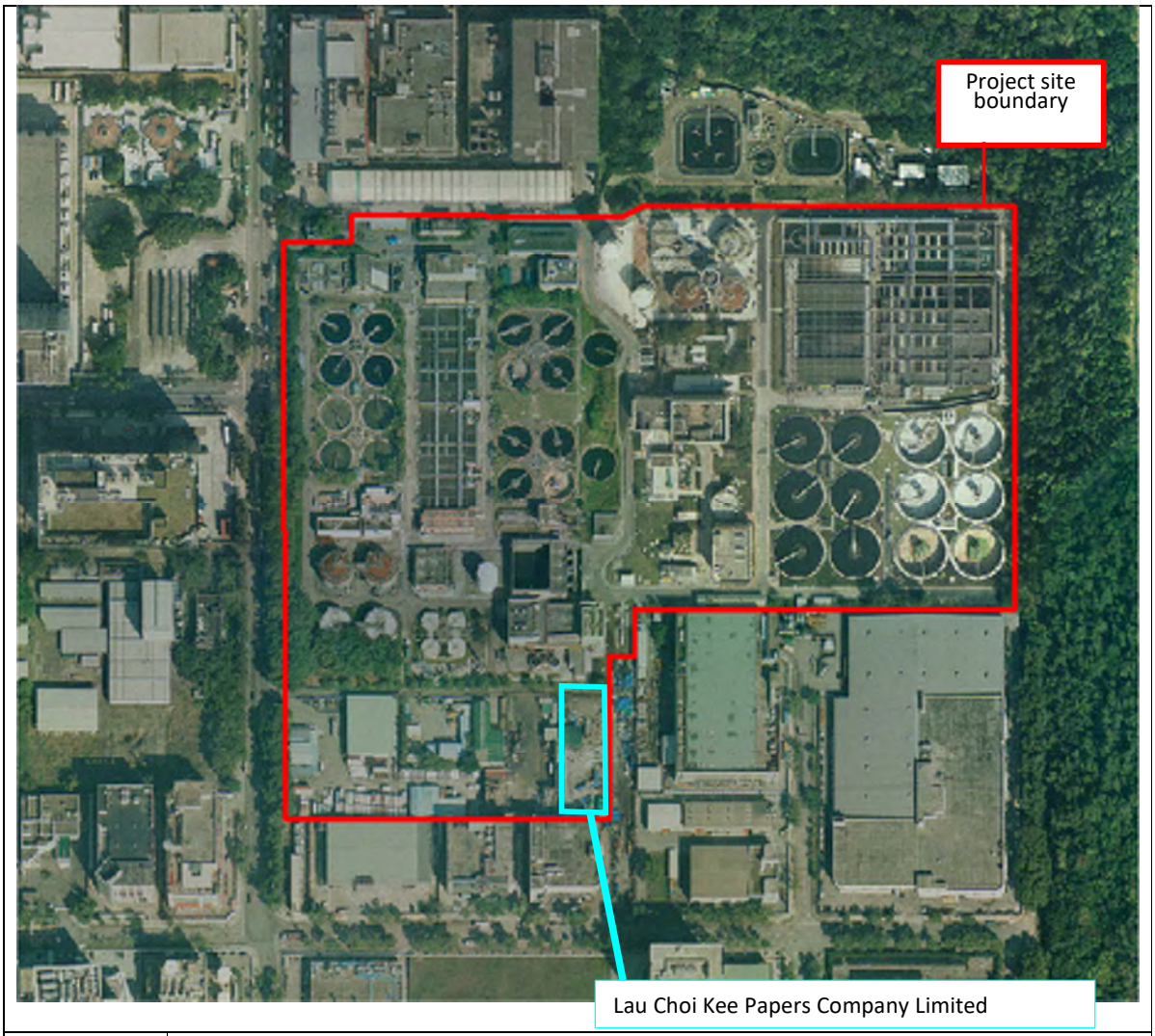
Year:	2014
Remarks:	<u>Project Site</u> 1. TPSTW Stage V was completed and in operation. 2. Construction of some Final Sedimentation Tanks is observed in the east part of TPSTW. 3. According to the STT record of Lands Department, Fook Woo Waste Paper Company Limited was the tenant in the eastern lot of the proposed expansion site (in Lot No. STT 1745) since 2013. It was a business in the recovery and recycling or reprocessing of metals, papers, plastics, tyres, electrical and electronic appliances, glass, textile and old clothes, wood and furniture, organic waste (excluding chemical waste) or any combination of the above materials found in and recovered from municipal solid waste. 4. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 5. No obvious changes for all surrounding off-site areas.



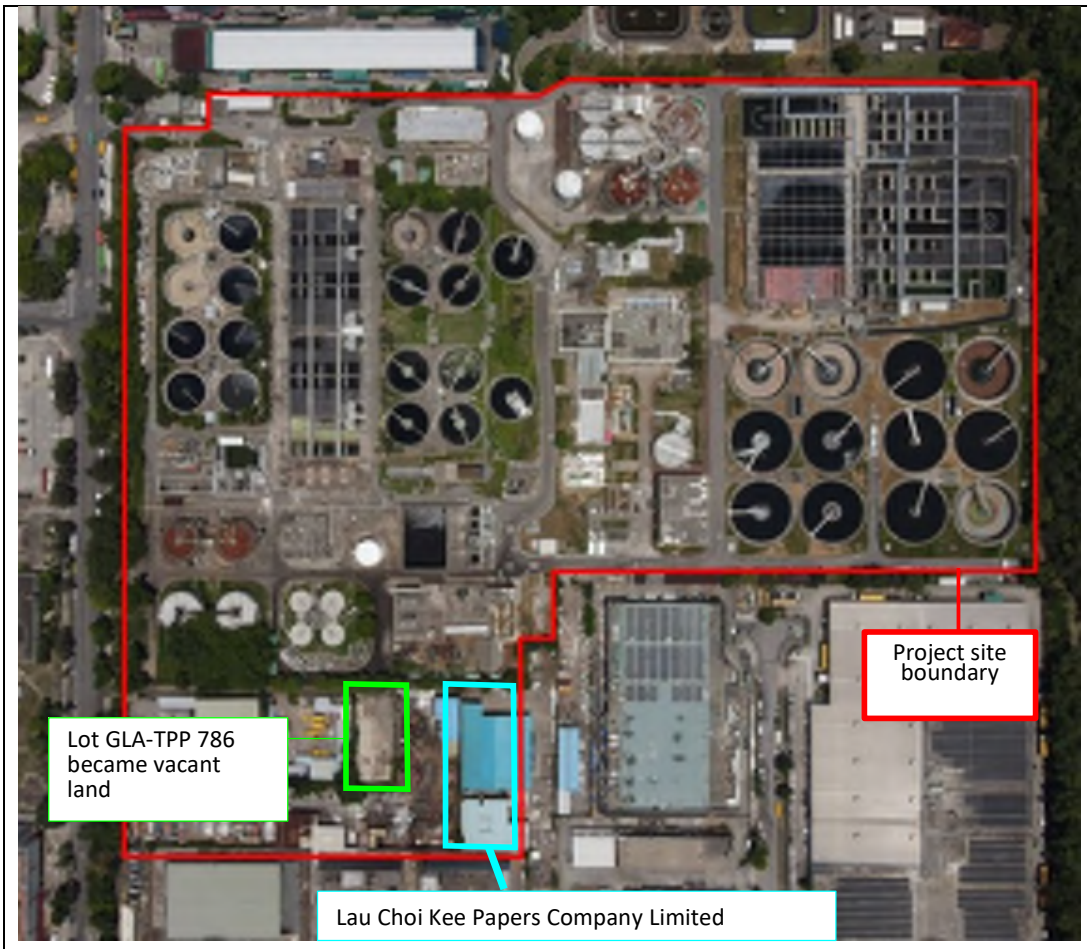
Year:	2015
Remarks:	<u>Project Site</u> 1. Construction of the Final Sedimentation Tanks previously observed in the east part of TPSTW was completed. 2. Some shelters in C & H Import and Export Co. and Fook Woo Waste Paper Company Limited in the eastern lots of the proposed expansion site (Lot No. STT 1450 and 1745) were demolished. 3. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 4. No obvious changes for all surrounding off-site areas.



Year:	2016
Remarks:	1. No obvious changes for the Project site and surrounding off-site areas.



Year:	2018
Remarks:	<u>Project Site</u> 1. According to the STT record of Lands Department, Lau Choi Kee Papers Company Limited was the tenant in the eastern lot of the proposed expansion site (Lot No. STT 1745) since 2017. It was a business in recovery and recycling or in connection with reprocessing of plastics found in and recovered from municipal solid waste. 2. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 3. No obvious changes for all surrounding off-site areas.



Year:	2020
Remarks:	<u>Project Site</u> 1. Shelters were built in the eastern lot (Lau Choi Kee Papers Company Limited) in the proposed expansion site. 2. The CEDD's office previously observed in the middle of the proposed expansion site (in Lot GLA-TPP 786) was removed and the lot became vacant. 3. No obvious changes in other Project areas. <u>Surrounding Off-site Areas</u> 4. No obvious changes for all surrounding off-site areas.

ANNEX 2.2

ACQUISITION OF INFORMATION FROM GOVERNMENT DEPARTMENTS

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS
BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (148) in FSD GR 6-5/4 R Pt. 29
來函檔號 YOUR REF. : 405045-0068
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

RECEIVED
12 NOV 2020

RECEIVED BY FAX			
ACTION REQUIRED BY	CHH	AS	
FILE	405045		
REPLY BY	DATE		
TO SEE			

11 November 2020

Black & Veatch Hong Kong Limited
43/F, AIA Kowloon Tower,
100 How Ming Street, Kwun Tong
Hong Kong
(Attn: Ms. Christina KO, Project Manager)

By fax (2601 3988) only

Dear Ms. KO,

Agreement No. CE 50/2019(DS)
Upgrading of Tai Po Sewage Treatment Works - Investigation
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 24.9.2020 regarding the captioned request and reply below in response to your questions.

According to our record, from the year of 1990 to present moment, dangerous goods licenses have been issued by this department to the subject address, with details as shown in **Appendix A**. No incident record was found at the aforesaid location with your given conditions.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(NG Wing-chit)
for Director of Fire Services

Appendix A

Agreement No. CE 50/2019(DS)
Upgrading of Tai Po Sewage Treatment Works - Investigation
Request for Information of Dangerous Goods & Incident Records

Item	Type of DG	Quantity	Storage Location
1.	Cat.7	10,000 Litres	A/G tank on the open ground of Tai Po Sewage Treatment Works
2.	Cat.3	2,400 Litres	Tai Po Sewage Treatment Works
3.	Cat.3	13,500Litres	
4.	Cat.3	2,400 Litres	
5.	Cat.3	24,000Litres	
6.	Cat.4	1,000 Litres	
7.	Cat.4	1,000 Litres	

Black & Veatch Hong Kong Limited
43/F, AIA Kowloon Tower, 100 How Ming Street, Kwun Tong, Hong Kong
博威工程顧問有限公司
香港九龍觀塘巧明街100號友邦九龍大樓43樓
Tel 電話 +852 2601 1000 • Fax 傳真 +852 2601 3988
Email 電郵 bvhk@bv.com

OUR REF 405045-0068 **BY EMAIL AND BY POST**

YOUR REF

DATE 24 September 2020

To Distribution List

Dear Sirs,

Agreement No. CE50/2019 (DS)
Upgrading of Tai Po Sewage Treatment Works – Investigation
Request for Information – Chemical Waste Producers and Chemical/Incident Records

We are the Consultants appointed by the Drainage Services Department (DSD) for the above captioned Project. The Project mainly aims to upgrade the Tai Po Sewage Treatment Works (TPSTW) capacity. In order to enable our assessment on land contamination within the works limit of the Project (see attached **Figure 1** and **Figure 2**), we would like to request for the most up-to-date information/records of the following, where applicable:

1. License/registration of any properties within the works limit as chemical waste producer.
2. Records of Dangerous Goods License issued within the works limit.
3. Past and present chemical spillage/leakage incident records in the works limit.
4. Any other information related to the use and/or storage of chemicals and dangerous goods in the works limit.

Owing to the space limitation within the existing TPSTW, a piece of government land to the south of the existing TPSTW is identified as the proposed expansion site for the Project. The works limit of the Project would therefore cover the existing TPSTW site and the proposed expansion site.

We would be grateful if you could provide us with the requested information listed above, if any, on or before **7 October 2020**. A nil return is appreciated.

Should you have any queries, please feel free to contact our Ms. Amy Cheung at 2608 7391.

Yours faithfully,
for and on behalf of
BLACK & VEATCH HONG KONG LIMITED

CHRISTINA KO
PROJECT MANAGER

AC
Enclosure(s)
c.c. DSD/Sewerage Project Division Mr. AU Chun Wai, David (Engr/Sewerage Projects 25)

DISTRIBUTION LIST

Fire Services Department
Management Group
9/F, Fire Services Headquarters Building
1 Hong Chong Road
Tsim Sha Tsui East
Kowloon

-Attn: Mr. TANG Wing Wah

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10th floor, Shatin Government Offices
1 Sheung Wo Che Road
Sha Tin
New Territories

-Attn: Mr.NG Hon Wing, Wallace

Figure 1 Works Limit - Overview

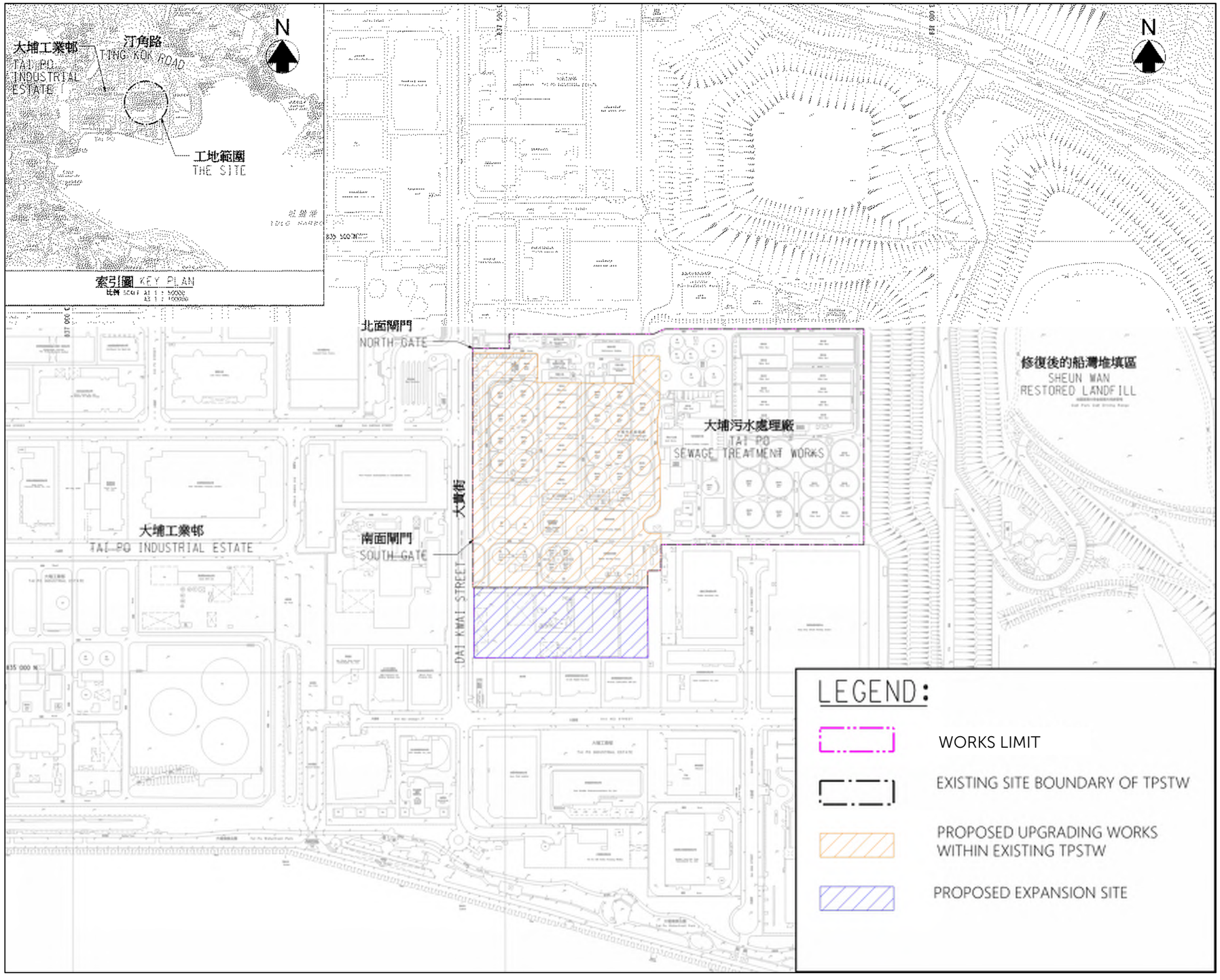
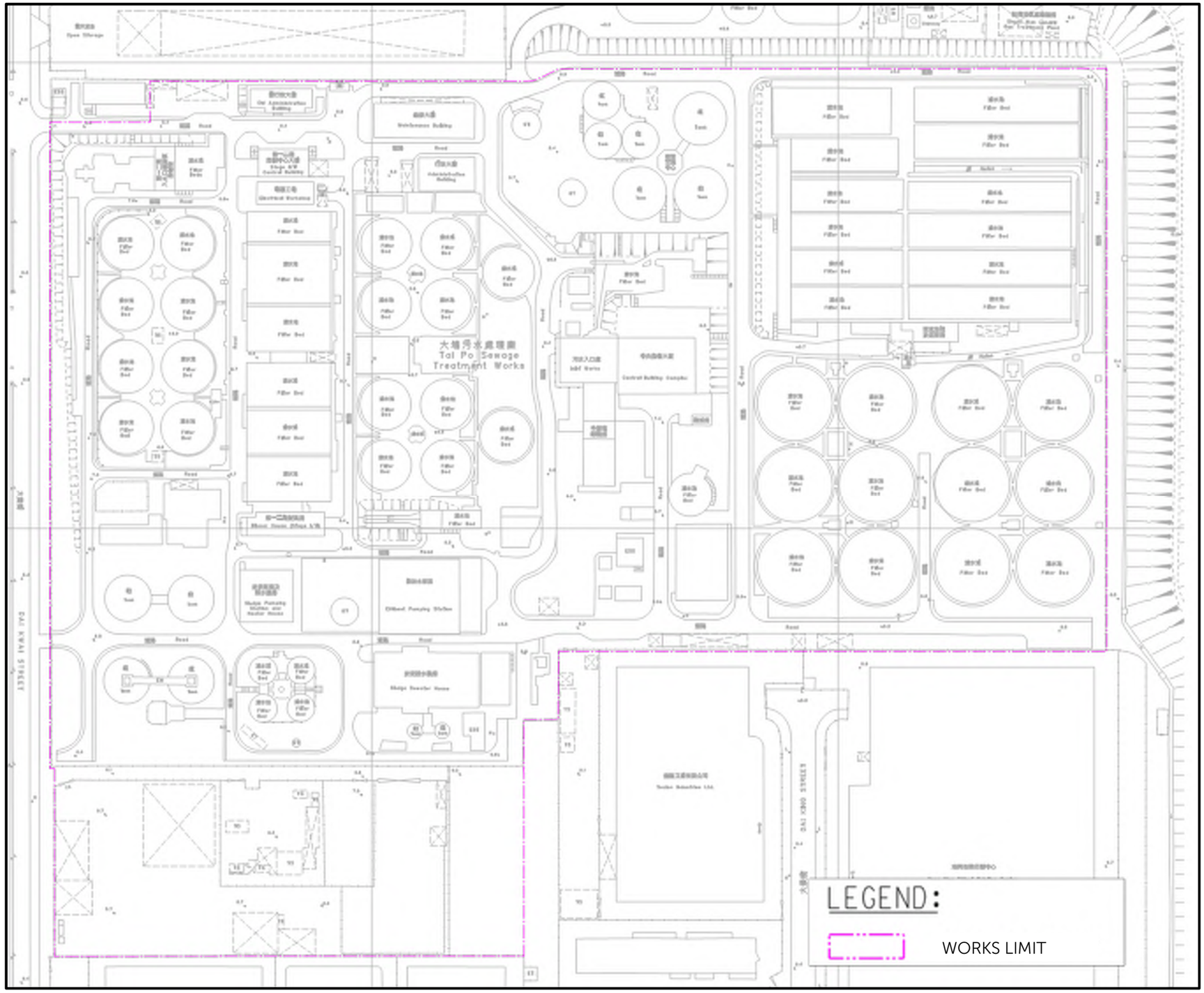


Figure 2 Works Limit – Close Up



本署檔案
OUR REF: ( ) in EP580/E6/8
來函檔案
YOUR REF: 405045-0068
電　話
TEL. NO.: 2158 5822
圖文傳真
FAX NO : 2650 6033
電子郵件
E-MAIL:
網　址
HOMEPAGE: http://www.epd.gov.hk

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F., Shatin Government Office,
1 Sheung Wo Che Road,
Sha Tin, New Territories,
Hong Kong

環境保護署
環保法規管理科
區域辦事處(北)
香港新界沙田
上禾輋路一號
沙田政府合署 10 樓

By Post and By Email: cheungky@bv.com

Black &Veatch Hong Kong Limited
43/F, AIA Kowloon Tower,
100 How Ming Street,
Kwun Tong, Hong Kong
(Attn.: Ms Christina KO and Ms Amy CHEUNG)

6 October 2020

Dear Ms KO and Ms CHEUNG,

Re: Agreement No. CE50/ 2019 (DS)
Upgrading of Tai Po Sewage Treatment Works – Investigation
Request for Information - Chemical Waste Producers and Chemical/ Incident Records

I refer to Ms KO's letter and Ms Cheung's email dated 24 September 2020 on the captioned subject.

According to the records in this office, there are no record of chemical spillage/leakage incident and submission relating to land contamination assessment within the works limit of the subject site (as depicted in Figure 1 and Figure 2 of your above letter) in the past five years.

As regards registered Chemical Waste Producer(s) at the location concerned, a registry of chemical waste producers is available in the Territorial Control Office of this department. Please contact our Chief Environmental Protection Inspector (Territorial Control)5, Mr Leung Chi-Keung, Dennis at 2835 1017 for making an appointment to view the records.

While we have made a reasonable effort to ensure the completeness and accuracy of information provided, you should comprehend that the information is provided as is and EPD is not responsible or liable for any claim, loss or damage resulting from the use of this information.

Yours sincerely,

(Wallace Ng)
Regional Office (North)
for Director of Environmental Protection

c.c. TCO/EPD (Attn.: Mr LEUNG Chi-keung, Dennis)　　Fax: 2305 0453

ANNEX 2.3

SITE WALKOVER CHECKLIST

ANNEX 2.3A

SITE WALKOVER CHECKLIST –

TAI PO SEWAGE TREATMENT WORKS

SITE WALKOVER CHECKLIST
Tai Po Sewage Treatment Works

General Site Details:
Site Owner: Drainage Services Department
Property Address: Tai Po Sewage Treatment Works , 7 Dai Kwai Street , Tai Po Industrial Estate , N.T.

Person Conducting the Questionnaire:
Name: Lee Ka Leong
Position: Senior Environmental Scientist

Authorized Owner/Client Representative (If Applicable)
Name: **Yiu Kwok Chai**
Position
Telephone: **2664 0016/9151 5513**

Site Activities

Number of employees:	**Full-time:**	**60**
	Part-time:	
	Temporary / Seasonal:	
Maximum no. of people on site at any time:		**70**
Typical hours of operation:		24 hours
Number of shifts:		3
Days per week:		7
Weeks per year:		52
Scheduled plant shut-down:		-
Detail the main sources of energy at the site:		
	Gas	**No**
	Electricity	**Yes**
	Coal	**No**
	Oil	**No**
	Other	**No**

Site Description

What is the total site area:	93,439 m^2(*Within the Proposed Works Area*) 121,970 (*Total area of the whole site*)
What area of the site is covered by buildings (%):	45% (*Within the Proposed Works Area*) 48 % (*Total area of the whole site*)
Please list all current and previous owners/occupiers if possible.	Drainage Services Department
Is a site plan available?	Yes
Are there any other parties on site as tenants or sub-tenants?	No

If yes, identify those parties: -

Description surround land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North:Industrial Buildings (Including : Maxim's Foods Factory 2 , Sunny Hose Company Limited , Kee Wah Production Centre)

South: Recycling industries (including Canny Star Environmental Protection Limited, C & H Import and Export Co. and Lau Choi Kee Plastic Company Limited), **DSD's and Contractor's Site Office** and **Industrial Buildings**(Including: Hung Fook Tong Group Limited , Process Automation International Limited , Tong Fong Hung , Winner Food Products Limited , ABB Industrial and Building System Ltd , Apex Print ,Beijing Tong Ren Tang International Limited , Phoenix Television Corporation , etc)

East: Golf Park Golfers Club (Past landuse : landfill)

West: Industrial Buildings (Including : Asia Television Digital Media Limited , Nissin Foods ,Lam Soon Hong Kong Limited ,Johnson Electric Industrial Manufactory , Oriental Press Centre , etc)

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.)

The site is located on a flat reclaimed land with gentle hills to the north and marine water body to the south.

State the size and location of the nearest residential communities.

Fortune Garden to the northeast (~5 ha) over 500 m away

Are they any sensitive habitats nearby, such as nature reserves, parks, wetlands or site of special scientific interest?

No

Questionnaire with Existing / Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities / operations at the above address?	-	Sewage treatment
2.	How long have you been occupying the site?	-	Since ~1979
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	Yes	Reclaimed land
4.	Prior to your occupancy, who occupied the site?	-	None
5.	What were the main activities / operations during their occupancy?	-	None
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station / car service garage?	No	
9.	Are there any boreholes / wells or natural springs either on the site or in the surrounding area?	Yes	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	Yes	Bio-gas holding tank
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Thinners, paints and lubricating Oil
	➢ Where do you store these chemicals?	-	Dangerous Goods (DG) Store and Lubricant Oil Store
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	Yes	Inventories are updated as needed.
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	Yes	Chemicals are delivered by trucks and stored on site inside drums , tanks
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	No underground storage of chemicals of concerns (COCs). There are ferric chloride underground storage

		Yes/No	Notes
			tanks, which are not COCs.
	➢ How many underground storage tanks do you have on site?	-	No underground storage of COCs
	➢ What are the tanks constructed of?	-	
	➢ What are the contents of these tanks?	-	
	➢ Are the pipelines above or below ground?	-	
	➢ If the pipelines are below ground, has any leak and integrity testing been performed?	-	
	➢ Have there been any spills associated with these tanks?	-	
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	Yes	Each Season Once
19.	How are the wastes disposed of?	-	General wastes / screening / grits to Landfill; sludge cakes to TPark; Spent UV lamps contained and collected by licensed waste collector.
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have you spills occurred on site? (If yes, please provide details.)	No	
	➢ When did the spill occur?	No	
	➢ What were the substances spilled?	No	
	➢ What was the quantity of material spilled?	No	
	➢ Did you notify the relevant departments of the spill?	No	
	➢ What were the actions taken to clean up the spill?	No	
	➢ What were the areas affected?	No	
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work / underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please	No	

		Yes/No	Notes
	provide details.)		

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	Yes	Chemicals are stored inside DG store and Lubricant Oil Store with secondary containment (e.g. concrete paved floor , plastic pallet ,wood pallet, racks).
2.	What are the conditions of the bund walls and floors?	-	Good condition (e.g. concrete paved floor , plastic pallet ,wood pallet , racks)
3.	Are there any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	Yes	Screenings from incoming sewage
5.	Is there a storage site for the wastes?	Yes	Screening collected in container and packed into plastic bags for landfill disposal
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (if yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (if yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	Yes	The sumps are currently used in the pumping of the sewage
12.	Any noticeable odours during site walkover?	Yes	Sewage smell only
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions,	Yes	Thinners, paints and lubricating oils

		Yes/No	Notes
	acids, anti-corrosive paints, thinners, coal, ask, oil tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?		

ANNEX 2.3B

SITE WALKOVER CHECKLIST –

DRAINAGE SERVICES DEPARTMENT'S AND CONTRACTOR'S SITE OFFICE

SITE WALKOVER CHECKLIST
Drainage Services Department's and Contractor's Site Office

General Site Details:
Site Owner: Drainage Services Department & China Road and Bridge Corporation
Property Address: 7B Dai Kwai Street , Tai Po Industrial Estate , N.T.

Person Conducting the Questionnaire:
Name: Lee Ka Leong
Position: Senior Environmental Scientist

Authorized Owner/Client Representative (If Applicable)

Name:	**Ms. Zheng**	**Mr. Sin**
Position	**AIOW**	**WSI**
Telephone:	**6052 0712**	

Site Activities

Number of employees:	**Full-time:**	**60**
	Part-time:	
	Temporary / Seasonal:	
Maximum no. of people on site at any time:		**60**
Typical hours of operation:		24 HOURS
Number of shifts:	**2**	2
Days per week:	**7**	7
Weeks per year:	**52**	52
Scheduled plant shut-down:		-

Detail the main sources of energy at the site:

Gas	**NO**
Electricity	**YES**
Coal	**NO**
Oil	**NO**
Other	**NO**

Site Description

What is the total site area:	2020 m²
What area of the site is covered by buildings (%):	50%
Please list all current and previous owners/occupiers if possible.	Drainage Services Department & China Road and Bridge Corporation
Is a site plan available?	No
Are there any other parties on site as tenants or sub-tenants?	No
If yes, identify those parties: -	-

Description surround land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.
North: Tai Po Sewage Treatment Works

South: Waste recycling industries
East: Open area & waste recycling industries
West: Waste **r**ecycling industries

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.)
The site is located in Tai Po Industrial Estate which is a reclaimed land with gentle hills to the north and open sea to the south.

State the size and location of the nearest residential communities.

Fortune Garden to the northeast of the Site (~5 ha) over 500m away

Are they any sensitive habitats nearby, such as nature reserves, parks, wetlands or site of special scientific interest?

No

Questionnaire with Existing / Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities / operations at the above address?	-	Site Office
2.	How long have you been occupying the site?	-	
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	Yes	Reclaimed land
4.	Prior to your occupancy, who occupied the site?	-	
5.	What were the main activities / operations during their occupancy?	-	
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station / car service garage?	No	
9.	Are there any boreholes / wells or natural springs either on the site or in the surrounding area?	No	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	
	➢ Where do you store these chemicals?	-	
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	No	
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
	➢ How many underground storage tanks do you have on site?	-	
	➢ What are the tanks constructed of?	-	
	➢ What are the contents of these tanks?	-	
	➢ Are the pipelines above or below ground?	-	
	➢ If the pipelines are below ground, has any leak and integrity testing been performed?	-	

		Yes/No	Notes
	➢ Have there been any spills associated with these tanks?	-	
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	No	
19.	How are the wastes disposed of?	-	Domestic waste send to Landfill
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have you spills occurred on site? (If yes, please provide details.)	No	
	➢ When did the spill occur?	No	
	➢ What were the substances spilled?	No	
	➢ What was the quantity of material spilled?	No	
	➢ Did you notify the relevant departments of the spill?	No	
	➢ What were the actions taken to clean up the spill?	No	
	➢ What were the areas affected?	No	
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work / underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	
2.	What are the conditions of the bund walls and floors?	No	
3.	Are there any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5.	Is there a storage site for the wastes?	Yes	
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (if yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (if yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	Yes	From TPSTW (sewage smell)
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ask, oil tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	No	

ANNEX 2.3C

SITE WALKOVER CHECKLIST

- C & H IMPOST AND EXPORT CO.

SITE WALKOVER CHECKLIST
C & H Import and Export Co.

General Site Details:
Site Owner: C & H Import and Export Co.
Property Address: 7D Dai Kwai Street , Tai Po Industrial Estate , N.T.

Person Conducting the Questionnaire:
Name: Lee Ka Leong
Position: Senior Environmental Scientist

Authorized Owner/Client Representative (If Applicable)
Name: Mr. Tong
Position Manager
Telephone:

Site Activities

Number of employees:	**Full-time:**	**16**
	Part-time:	**1**
	Temporary / Seasonal:	**No**
Maximum no. of people on site at any time:		**16**
Typical hours of operation:	**10 hours(Mon-Sat ; 8:00-18:00)**	
Number of shifts:		**N/A**
Days per week:		**6**
Weeks per year:		**52**
Scheduled plant shut-down:		**General Holidays**
Detail the main sources of energy at the site:		
	Gas	**No**
	Electricity	**Yes**
	Coal	**No**
	Oil	**Yes (engine oil)**
	Other	**No**

Site Description

What is the total site area:	3,412 m^2
What area of the site is covered by buildings (%):	25%
Please list all current and previous owners/occupiers if possible.	N/A
Is a site plan available?	No
Are there any other parties on site as tenants or sub-tenants?	No
If yes, identify those parties:	-

Description surround land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.
North: Tai Po Sewage Treatment Works
South: Arvato Bertelsmann

East: Waste recycling industries
West: Vacant Land

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.)
The site is located in Tai Po Industrial Estate, which is on a reclaimed land surrounded by gentle hills to the north and sea water body to the south.

State the size and location of the nearest residential communities.

Fortune Garden to the northeast (~5 ha) over 500 m away

Are they any sensitive habitats nearby, such as nature reserves, parks, wetlands or site of special scientific interest?

No

Questionnaire with Existing / Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities / operations at the above address?	-	Metal Trading Workshop
2.	How long have you been occupying the site?	-	Over 8 years
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	
4.	Prior to your occupancy, who occupied the site?	-	Unknown
5.	What were the main activities / operations during their occupancy?	-	
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station / car service garage?	No	
9.	Are there any boreholes / wells or natural springs either on the site or in the surrounding area?	No	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Engine oils
	➢ Where do you store these chemicals?	-	Placed in drums
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	-	Delivered by trucks and stored in drums.
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
	➢ How many underground storage tanks do you have on site?	No	
	➢ What are the tanks constructed of?	-	
	➢ What are the contents of these tanks?	-	
	➢ Are the pipelines above or below ground?	-	
	➢ If the pipelines are below ground, has any leak and integrity testing been performed?	-	
	➢ Have there been any spills associated with these tanks?	-	
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please	No	

		Yes/No	Notes
	provide details.)		
19.	How are the wastes disposed of?	-	Send to Landfills
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have you spills occurred on site? (If yes, please provide details.)	No	
	➢ When did the spill occur?	-	
	➢ What were the substances spilled?	-	
	➢ What was the quantity of material spilled?	-	
	➢ Did you notify the relevant departments of the spill?	-	
	➢ What were the actions taken to clean up the spill?	-	
	➢ What were the areas affected?	-	
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work / underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	Yes	Acetylene cylinder and compressed air are stored in cylinder and inside the storage box
2.	What are the conditions of the bund walls and floors?	-	Paved concrete floor
3.	Are there any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5.	Is there a storage site for the wastes?	No	
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (if yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (if yes, please provide details.)	No	
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	No	
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ask, oil tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Yes	Metal Wastes

ANNEX 2.3D

SITE WALKOVER CHECKLIST

- LAU CHOI KEE PLASTIC COMPANY LIMITED

SITE WALKOVER CHECKLIST
Lau Choi Kee Plastic Company Limited

General Site Details
Site Owner: Lau Choi Kee Plastic Company Limited.
Property Address: 13 Dai Hei Street , Tai Po Industrial Estate , N.T.

Person Conducting the Questionnaire:
Name: Lee Ka Leong
Position: Senior Environmental Scientist

Authorized Owner/Client Representative (If Applicable)
Name: **Mr. Wong**
Position **Manager**
Telephone:

Site Activities

Number of employees:	**Full-time:**	**2**
	Part-time:	**2**
	Temporary / Seasonal:	**No**
Maximum no. of people on site at any time:		**4**
Typical hours of operation:	**10 hours(Mon-Sat ; 8:00-18:00)**	
Number of shifts:		**1**
Days per week:		**6**
Weeks per year:		**52**
Scheduled plant shut-down:		**General Holidays**
Detail the main sources of energy at the site:		
	Gas	**No**
	Electricity	**Yes**
	Coal	**No**
	Oil	**No (engine oil)**
	Other	**No**

Site Description

What is the total site area:	3,054 m^2 (*Within the Proposed Works Area*) 4,946m^2 (*Total area of the whole site*)
What area of the site is covered by buildings (%):	50% (*Within the Proposed Works Area*) 31% *(Total area of the whole site)*
Please list all current and previous owners/occupiers if possible.	N/A
Is a site plan available?	No
Are there any other parties on site as tenants or sub-tenants?	No

If yes, identify those parties: -

Description surround land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.

North: Tai Po Sewage Treatment Works

South: Process Automation International Limited

East: Taclon Industrial Building (Hung Fook Tong Group Limited)

West: C & H Import and Export Co.

Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.)

The site is located in Tai Po Industrial Estate, which is on a reclaimed land surrounded by gentle hills to the north and sea water body to the south.

State the size and location of the nearest residential communities.

Fortune Garden to the northeast of the Site (~5 ha) over 500 m away

Are they any sensitive habitats nearby, such as nature reserves, parks, wetlands or site of special scientific interest?

No

Questionnaire with Existing / Previous Site Owner or Occupier

		Yes/No	Notes
1.	What are the main activities / operations at the above address?	-	Plastic Workshop
2.	How long have you been occupying the site?	-	Around 1- 2 years
3.	Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	
4.	Prior to your occupancy, who occupied the site?	-	Unknown
5.	What were the main activities / operations during their occupancy?	-	
6.	Have there been any major changes in operations carried out at the site in the last 10 years?	No	
7.	Have any polluting activities been carried out in the vicinity of the site in the past?	No	
8.	To the best of your knowledge, has the site ever been used as a petrol filling station / car service garage?	No	
9.	Are there any boreholes / wells or natural springs either on the site or in the surrounding area?	No	
10.	Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	
11.	Are any chemicals used in your daily operations? (If yes, please provide details.)	No	
	➢ Where do you store these chemicals?	-	
12.	Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	
13.	Has the facility produced a separate hazardous substance inventory?	No	
14.	Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details)	No	
15.	How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	-	Delivered by trucks and stored bags.
16.	Do you have any underground storage tanks? (If yes, please provide details.)	No	
	➢ How many underground storage tanks do you have on site?	No	
	➢ What are the tanks constructed of?	-	
	➢ What are the contents of these tanks?	-	
	➢ Are the pipelines above or below ground?	-	
	➢ If the pipelines are below ground, has any leak and integrity testing been performed?	-	
	➢ Have there been any spills associated with these tanks?	-	
17.	Are there any disused underground storage tanks?	No	
18.	Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please	No	

		Yes/No	Notes
	provide details.)		
19.	How are the wastes disposed of?	-	Wastes are stored in bags, and trucks will come to collect the wastes once a week.
20.	Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	
21.	Have you spills occurred on site? (If yes, please provide details.)	No	
	➢ When did the spill occur?	-	
	➢ What were the substances spilled?	-	
	➢ What was the quantity of material spilled?	-	
	➢ Did you notify the relevant departments of the spill?	-	
	➢ What were the actions taken to clean up the spill?	-	
	➢ What were the areas affected?	-	
22.	Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work / underground tanks (If yes, please provide details.)	No	
23.	Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	
24.	Are there any known contaminations on site? (If yes, please provide details.)	No	
25.	Has the site ever been remediated? (If yes, please provide details.)	No	

Observations

		Yes/No	Notes
1.	Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	
2.	What are the conditions of the bund walls and floors?	-	The floors are unpaved.
3.	Are there any surface water drains located near to drum storage and unloading areas?	No	
4.	Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	
5.	Is there a storage site for the wastes?	No	Wastes are being put inside bags and place randomly on floor inside the site area.
6.	Is there an on-site landfill?	No	
7.	Were any stressed vegetation noted on site during the site reconnaissance? (if yes, please indicate location and approximate size.)	No	
8.	Were any stained surfaces noted on-site during the site reconnaissance? (if yes, please provide details.)	Yes	Check video
9.	Are there any potential off-site sources of contamination?	No	
10.	Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	
11.	Are there any sumps, effluent pits, interceptors or lagoons on site?	No	
12.	Any noticeable odours during site walkover?	No	
13.	Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ask, oil tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	No	

ANNEX 2.4

SITE WALKOVER PHOTO RECORDS

West Plant of TPSTW (Northern Portion) – Index Plan

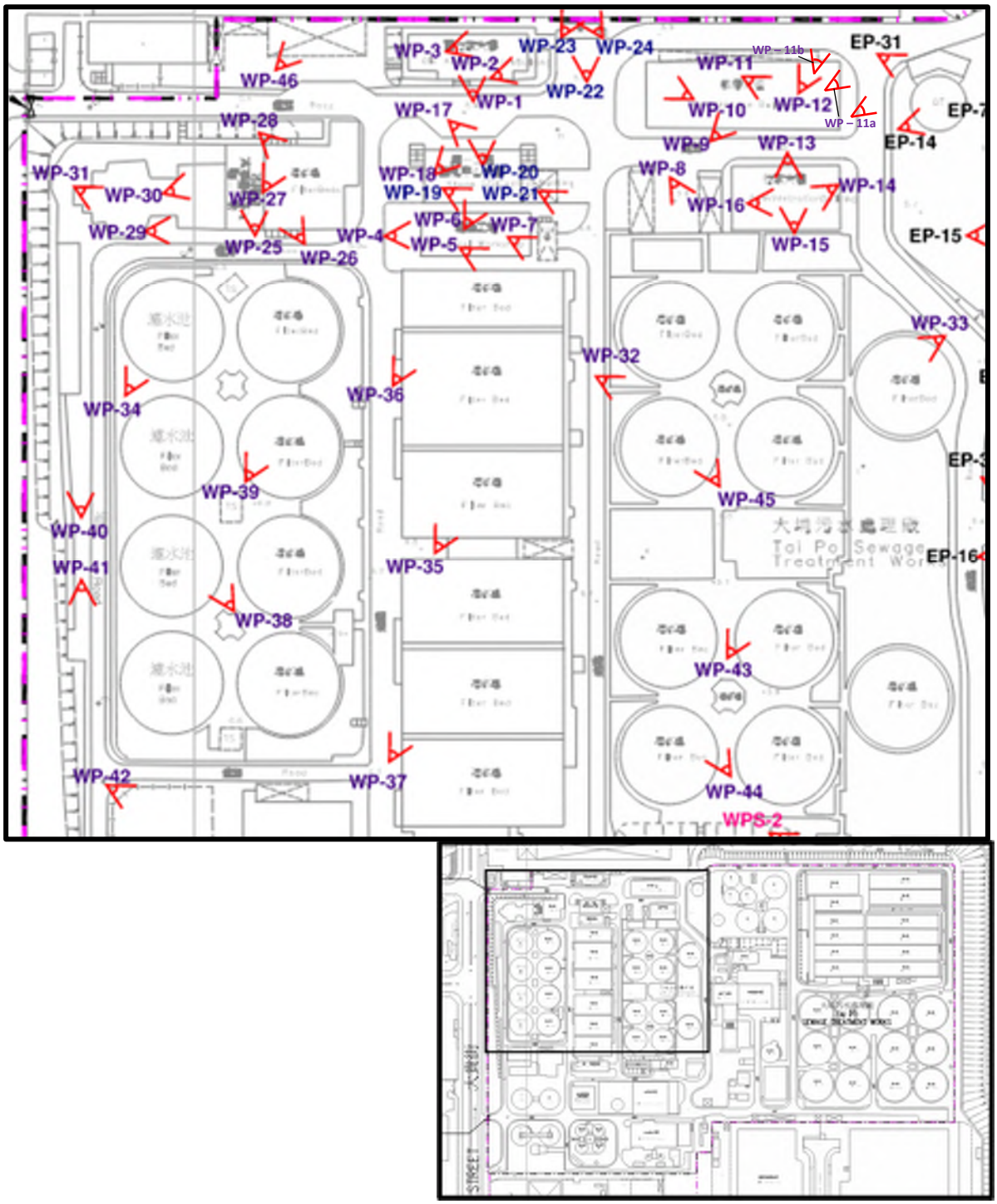


Photo WP-1: Old Administration Building (External View) – It is a two-storey building located on concrete paved floor in good condition. No oil stain/ leakage is observed.

Photo WP-2: Old Administration Building (External Outlet) – Chemical waste were placed inside specific steel box at the outlet of the Administration House. F waste are well contained with no observation of leakage/ spillage.

Photo WP-3: Old Administration Building – The second floor of the Old Administration Building is paved with concrete slab, the Maintenance Section Office is located on the second floor.

Photo WP-4: Electrical Workshop (External View) – No oil stain / floor leakage observed.

Photo WP-5: Electrical Workshop - The tool desks are located on concrete paved floor with small area of water stain is observed. Maintenance work of small equipment was carried out. Cracks were observed on the floor. No oil stain / leakage is observed.

Photo WP-6: Electrical Workshop – Tools and equipment are stored on racks. The floor is paved with concrete in good condition with no oil stain / leakage observed.

Photo WP-7: Electrical Workshop – Tools and equipment are stored on racks or wooden panel. The floor is paved with concrete in good condition with no oil stain / leakage observed.

Photo WP-8: Staff Car Park - The car park is located on concrete paved floor, shelter is built for protecting workers and their vehicles from weather. No oil stain / leakage is observed in the area of the car park.

Photo WP-9: Maintenance Building (External View) – The building is located on concrete paved floor, stain caused by weathering can be observed. No oil stain / leakage is observed.

Photo WP-10: Maintenance Building – The floor is paved with concrete, small tools and equipment are placed on racks. Some other equipment was placed on the floor, there are some bicycle carrying cleaning tools parked here. No oil stain / leakage is observed.

Photo WP-11: Maintenance Building – The floor is paved with concrete, no oil stain / leakage is observed. Equipment were located on wooden panel, some equipment were placed on the floor. Some unpacked paper boxes were placed here for storage.

Photo WP-11a: Cabinet No.1 – About 6 buckets of Lubricant Oil, 1 bucket of Cutting Oil and 3 bottles of waste oil are stored inside the Cabinet No.1, the condition of the cabinet is fair and is located on concrete paved floor. No leakage or spillage was observed, and no oil stain was observed.

Photo WP-11b: Cabinet No.2 – Paint (about 12 cans of Paint) are stored inside the Cabinet No.2, the condition of the cabinet is fair and is located on concrete paved floor. No leakage or spillage was observed, and no oil stain was observed.

Photo WP-12: Maintenance Building – The floor is paved with concrete, tools and equipment were placed on steel racks in good manner. Some wheelbarrow were used for carrying wasted materials.

Photo WP-13: Administrative Building (External view) - The building is a two-storey building located on concrete paved floor in good condition. No oil stain/leakage is observed.

Photo WP-14: Administrative Building (First Floor) - The floor is paved with flooring plate and concrete in good condition floor. This floor is mainly used for office and administration works.No oil stain/ spillage is observed.

Photo WP-15: Administrative Building (Second Floor) – The Document Room is loacted on concrete paved floor opposite to the laboratory. No oil stain/ leakage is observed.

Photo WP-16: Administrative Building (Second Floor) - The Laboratory is located on this floor next to the Switch Room on concrete paved floor in good condition

Photo WP-17: Control and Storage House (External View) – It is a two-storey building with the storage room of equipment on the ground floor and the control room on the second floor. The building is located on concrete paved floor, water stain was observed, no oil stain/ leakage is observed.

Photo WP-18: Control and Storage House (Storage Room on First Floor) - Most of the equipment are stored on steel racks, some are being put on the floor inside cardboard box. The floor is paved with ceramic tile and concrete. No damage/ broken parts is observed, and no oil stain/leakage is observed.

Photo WP-19: Control and Storage House (Storage Room on First Floor) - Equipment (electronic wire) was being put on wooden panel or wooden box. The floor is paved with ceramic tile and concrete in good condition. No oil stain/leakage is observed.

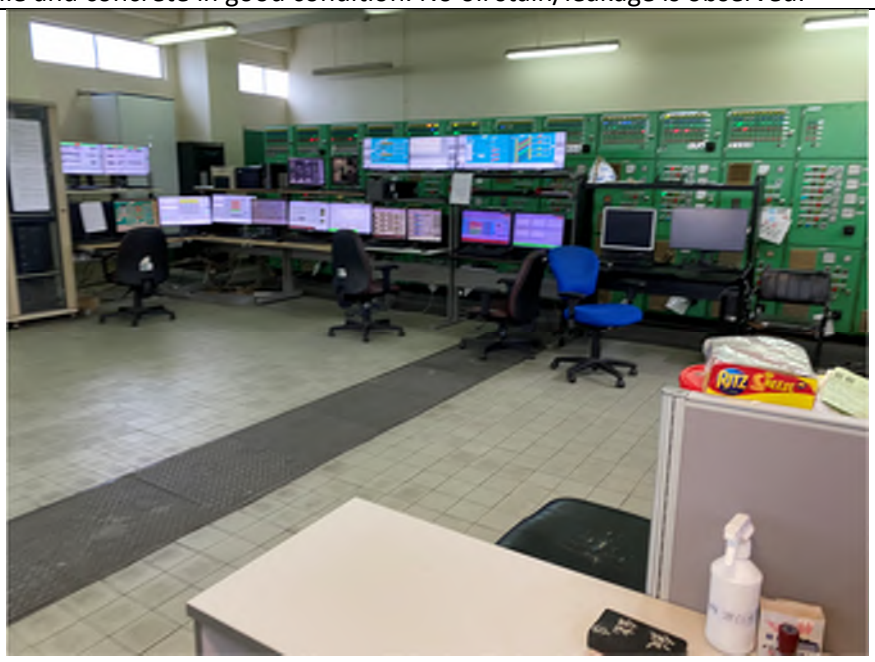


Photo WP-20: Control and Storage House (Control Room with Control Panels on Second Floor) - The floor is paved with ceramic tile and concrete in good condition. No oil stain/leakage is observed.

Photo WP-21: Control and Storage House (Staff Room on Second Floor) – It is next to the Control Room. The floor is paved with ceramic tile and concrete in good condition. No oil stain/leakage is observed.

Photo WP-22: Dangerous Goods (DG) Store (External View) - The DG Store is located on concrete paved floor. No oil stain/ leakage is observed.

Photo WP-23: Dangerous Goods (DG) Store – The soluble cutting oil, hydraulic oil, lubricant oil, gear oil were stored inside the DG store. DG were located on steel panel and concrete paved floor. No oil stain/ leakage is observed.

Photo WP-24: Dangerous Goods (DG) Store – Paint were stored inside the DG Store. Some paint were placed on the steel panel inside the container and the carboard box; Some were stored inside the steel rack. No oil stain/leakage is observed.

Photo WP-25: Inlet Pumping Station of West Plant (Screw Pump Control Room) – No oil stain / floor leakage observed.

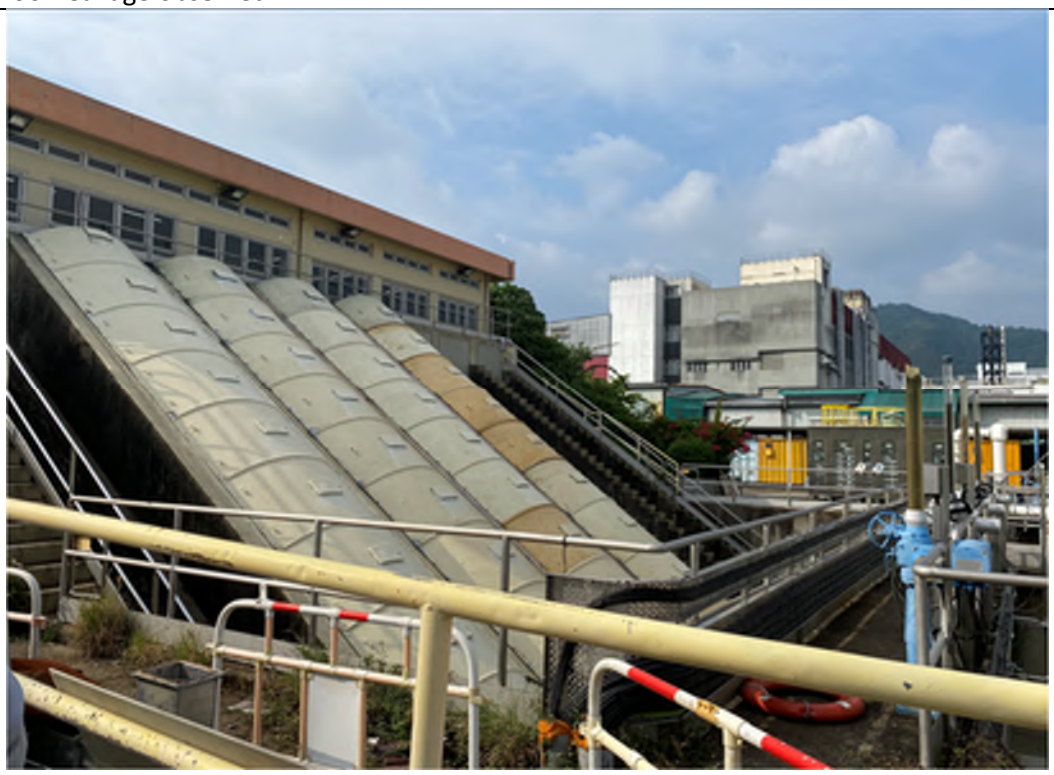


Photo WP-26: Inlet Pumping Station of West Plant (External view of Screw Pump) – The Screw Pumps are located on concrete paved floor at 3.4 m above the ground level. All accessible concrete surfaces around the pumps are in good condition with no oil stain observed.

Photo WP-27: Inlet Pumping Station of West Plant (Screw Pump Control Room) – The room floor is located above ground on top of the screw pumps (at +20mPD) and is paved with concrete and ceramic tile, dirty stain and debris is observed, trash and other used materials(e.g. windows) are being placed on the floor at one corner of the room. No oil stain/ leakage is observed.

Photo WP-28: Inlet Pumping Station of West Plant (Screw Pump Control Room) – The room floor is located above ground on top of the screw pumps (at +20 mPD) and is paved with concrete, dirty stain and rusty stain is observed. No damage of the pumps and the floor is found. No oil stain/ leakage is observed.

Photo WP-29: Screen House of West Plant – The Outlet of Screen House is located on an elevated concrete paved floor, with no oil stain observed. Water stain caused by handling of sludge is observed.

Photo WP-30: Outlet of Screen House (in West Plant) – The floor is paved with concrete in good condition, with no oil stain observed.

Photo WP-31: Detritors of West Plant– Detrtiors are located on elevated concrete paved floor next to the Outlet of Screen House with no oil stain observed.

Photo WP-32: Final Sedimentation Tanks of West Plant – The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-33: Final Sedimentation Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-34: Primary Sedimentation Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-35: Aeration Tanks of West Plant – The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-36: Aeration Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-37: Aeration Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-38: Primary Sedimentation Tanks of West Plant – The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-39: Primary Sedimentation Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-40: Road next to Primary Sedimentation Tanks of West Plant – The road is paved with concrete in good condition with no oil stain observed.

Photo WP-41: Road next to Primary Sedimentation Tanks of West Plant - The road is paved with concrete in good condition with no oil stain observed.

Photo WP-42: Waste Storage – The waste storage area is paved with concrete floor. No oil stain was observed. No chemical storage is allowed in the area. No chemical waste was ever been disposed of in the area since operation of TPSTW.

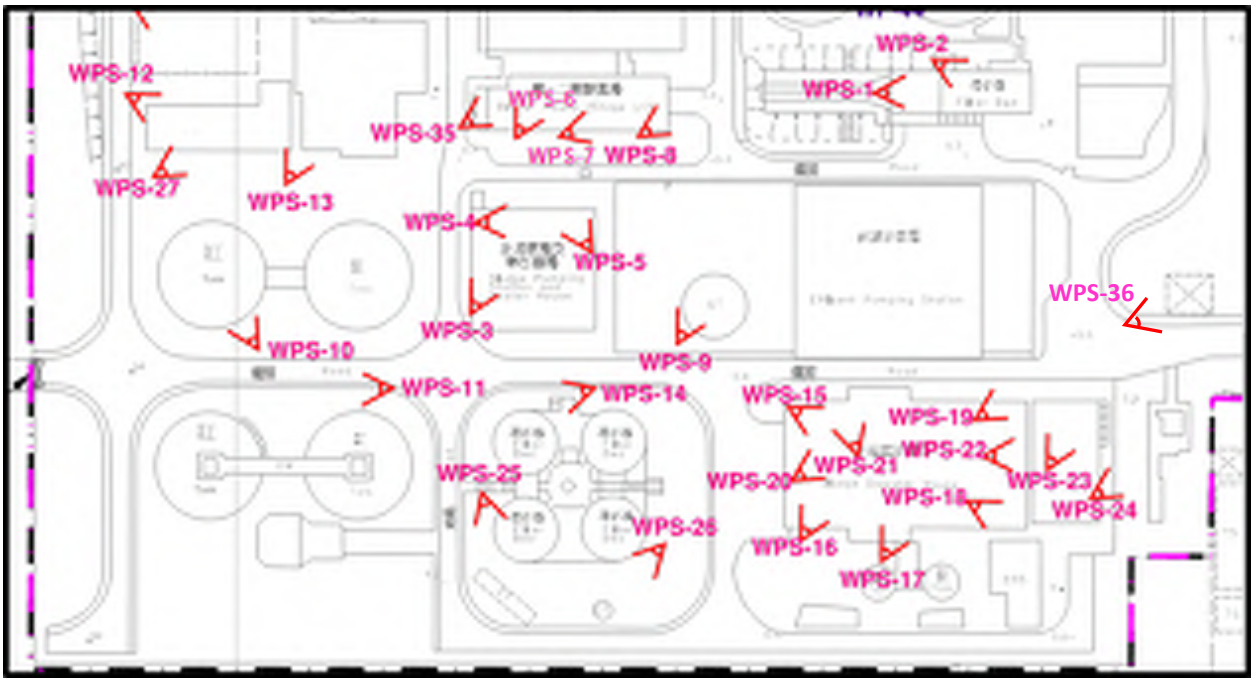
Photo WP-43: Final Sedimentation Tanks of West Plant- The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WP-44: Final Sedimentation Tanks of West Plant - The tanks are located on concrete paved floor with no oil stain/stressed vegetation observed.

Photo WP-45: Area between Final Sedimentation Tanks in West Plant– The area is paved with concrete floor and vegetation surrounding in good condition, no oil stain/stressed vegetation is observed.

Photo WP-46 : Workshop : The Workshop is located on concrete paved slab with shelters on the top of the workshops area. Water stain is observed due to bad weather, no oil stain/leakage is observed in this location.

West Plant of TPSTW (Southern Portion) – Index Plan



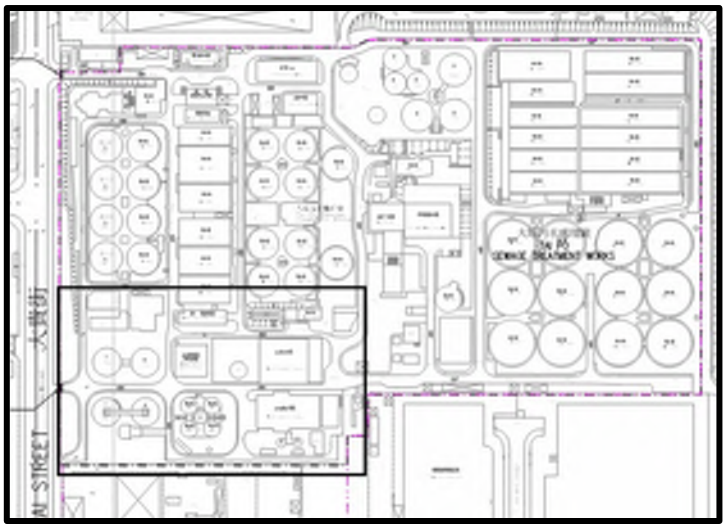


Photo WPS-1: Return Activated Sludge Pumping Station (Control Road) – The Control Panel is located above the basement level of the station, no oil stain is observed.

Photo WPS-2: Return Activated Sludge Pumping Station (Below Ground Level) – The Sludge Pumps are located on concrete floor in good condition with no oil stain.

Photo WPS-3: Sludge Pumping Station (Below Ground Leve) - The Sludge Pumps are located on concrete floor in good condition with no oil stain. The stains observed were stains of sewage sludge.

Photo WPS-4: Sludge Pumping Station – The Control Panel is located above the basement level with concrete paved floor in good condition with no oil stain observed.

Photo WPS-5: Sludge Pumping Station (Electronic Boiler)– The boiler is located above the basement level with ceramic tiles and concrete paved floor in good condition with no oil stain observed.

Photo WPS-6: Blower House (Entrance) – The external floor of the Blower House is paved with concrete floor in good condition with no oil stain/ stressed vegetation observed.

Photo WPS-7: Blower House (Air Blowers on Ground Floor) – The air blowers are located on ceramic tiles and concrete paved floor in good condition with no oil stain observed.

Photo WPS-8: Blower House (Pumps on Ground Floor) – Pumps are located on ceramic tiles and concrete paved floor in good condition with no oil stain observed.

Photo WPS-9: Bio-Gas Holding Tank of West Plant– The Bio-Gas Holding Tank is located on concrete paved floor in good condition with no oil stain observed.

Photo WPS-10: Sludge Digestion Tank of West Plant – The tank is located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WPS-11: Sludge Consolidation Tanks of West Plant - The tanks are located on concrete paved floor in good condition with no oil stain/stressed vegetation observed.

Photo WPS-12: Filtrate Treatment Complex – It is located on concrete paved panel in good condition, no oil stain is observed.

Photo WPS-13: Filtrate Treatment Units – The Filtrate Treatment Units is constructed with concrete located on concrete paved ground in good condition with no oil stains / stressed vegetation or potentially contaminating activities observed in the area.

Photo WPS-14: Primary Sludge Gravity Thickeners of West Plant– The thickeners are located on concrete paved floor with vegetation surrounding in good condition. No oil stain is observed.

Photo WPS-15: Sludge Dewatering House (Ground Floor) – The is the sludge loading located on concrete paved floor with no oil stain/stressed vegetation observed. The stains on the floor were caused by handling of sewage sludge. There is a basement below the ground.

Photo WPS-16: Sludge Dewatering House – The house is located on concrete paved floor with no oil stain observed.

Photo WPS-17: Chemical House – Equipment are stored and placed on wood panel inside the Chemical House with ceramic tiles with concrete paved floor. Only Ferric Chloride Storage Tanks were observed at this location, no other chemicals are stored at Chemical House. No oil stain is observed

Photo WPS-18: Chemical House –The Chemical House is paved with concrete floor in good condition with no oil stain observed.

Photo WPS-19: Chemical House – Some tools and equipment are placed on concrete paved floor, no oil stain is observed. No storage of COC is recorded / observed.

Photo WPS-20: Sludge Dewatering House (Upper Floor) – The upper floor is paved with concrete in good condition. The area is clean and dry with no oil stain.

Photo WPS-21: Sludge Dewatering House (Second Floor) - The floor is paved with concrete in good condition with no oil stain. The water stains observed on the floor were caused by handling of sewage sludge only. Land contamination from the operations in upper floor is not expected.

Photo WPS-22: Extension of Sludge Dewatering House – The ground floor is paved with concrete. No floor leakage is observed. The debris observed on the floor was debris of sewage sludge. There is a basement below the ground floor.

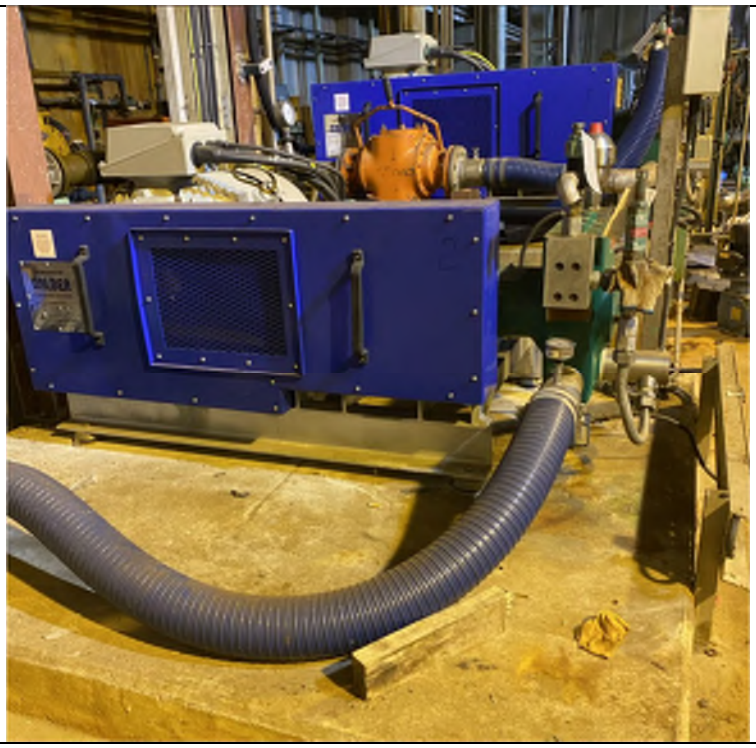


Photo WPS-23: Extension of Sludge Dewatering House – The pumps are located at the basement floor which is paved with concrete with no oil stain / floor leakage were observed.

Photo WPS-24: Extension of Sludge Dewatering House – The pumps are located at basement on paved with concrete in good condition with no oil stain. The water stains on the floor were caused by handling of sewage sludge.

Photo WPS-25: Combined Heat And Power Generating System of West Plant - The generating system is located on paved with concrete in good condition. No oil stain and stressed vegetation are observed.

Photo WPS-26: Combined Heat And Power Generating System of West Plant- The generating system is paved with concrete in good condition. No oil stain and stressed vegetation are observed.

Photo WPS-27 :Ferric Chloride Dosing System #1 - The system is located on an elevated platform with concrete slab. Two FeCl3 Storage Tanks are located under the shelter.

Photo WPS-28: UV Disinfection Facilities – The UV Disinfection Facilities is located on concrete paved slab. Vegetation is observed near the facilities in good condition. No oil stain/ leakage is observed.

Photo WPS-29: UV Disinfection Facilities – The floor under the shelter of the UV Disinfection Facilities is paved with concrete slab and covered by green floor mat. No oil stain /leakage is observed in this location.

Photo WPS-30: Effluent Pumping Station – The Wet Well is constructed with concrete paved bund wall, treated effluent is transferred from the UV disinfection facilities and stored in the wet well. No oil stain/leakage is observed.

Photo WPS-31: Effluent Pumping Station – The transfer pumps, gear boxes and monitors are located on the ground floor of the Effluent Pumping Station. The floor is paved with concrete slab, no oil stain/leakage observed.

Photo WPS-32: Effluent Pumping Station -The Control Panel is located on the ground floor of the Effluent Pumping Station on concrete paved floor. No oil stain/leakage is observed.

Photo WPS-33: Effluent Pumping Station – The transfer pumps are located under the ground floor. Assessible path is constructed with steel panel. No oil stain/leakage is found in this located.

Photo WPS-34: Effluent Pumping Station – The Gate Valve is located under the ground floor. The Gate Valve is connected to the Wet Well of the Effluent Pumping Station. Water stain is observed due to handling of effluent. No oil stain/leakage is observed.

Photo WPS-35: Transformer – The transformer is located on concrete paved floor surrounded by vegetation. Cracks are observed near the transformer. However, the transformer is in good condition and maintained by CLP no leakage of transformer oil is observed. No oil stain/leakage is found in this location.

Photo WPS-36: Effluent Sampling shelter – Effluent sampling equipment is observed in this location. The facility is surrounded by vegetation and concrete paved surface. No sign of land contamination such as oil stains is identified.

East Plant of TPSTW – Index Plan

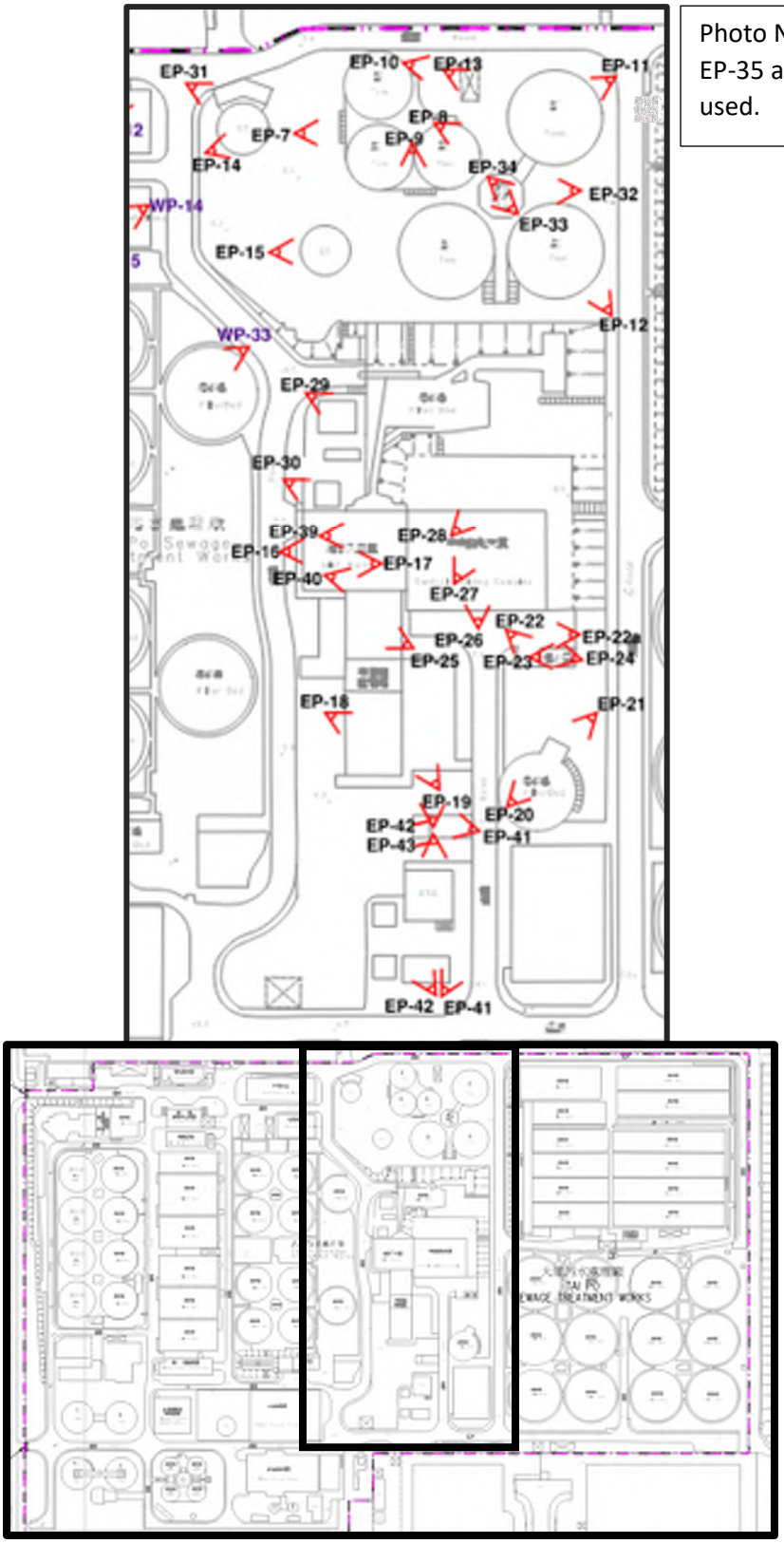


Photo Nos. EP-1 to EP-6, EP-35 and EP-36 are not used.

Photo EP-7: Sludge Consolidation Tanks of East Plant– The tanks are located on concrete paved floor. There is a two-storey building near the sludge consolidation tanks. Only dirty stain caused by weathering is observed, no oil stain/ stressed vegetation is observed.

Photo EP-8: Sludge Consolidation Tanks of East Plant (Upper Floor) – All accessible path are paved with concrete, water stain is observed due to handling of sludge. The tanks are in good condition, no damage or broken parts found. No oil stain/ leakage is observed.

Photo EP-9: Sludge Consolidation Tanks of East Plant (Ground Floor) - The floor is paved with concrete, dirty stain and water stain caused by weathering and handling of sludge is observed. There is no damage or broken tools observed.

Photo EP-10: Ferric Chloride Dosing System #2 (to the north of sludge Consolidation Tanks in East Plant) – This system is located on concrete paved floor. water stain and rusty stain were observed due to weathering and cleaning activities. Shelter is built to protect facility from being damaged by extreme weather.

Photo EP-11: Sludge Digestion Tanks of East Plant– The tanks are connected to the Service Tower Building. The Tanks and the Service Tower Building are located on concrete paved floor. No damage / leakage is observed. Only stain caused by weathering and water stain is observed.

Photo EP-12: Sludge Digestion Tanks of East Plant -There are total 3 Sludge Digestion Tanks surrounding the Service Tower Building, where 3 of them are located on concrete paved ground. No oil stain, leakage or damage is observed.

Photo EP-13: Ferric Chloride Dosing System #2 – The system is located on an elevated platform with concrete slab. Two FeCI3 Storage Tanks are located under the shelter. Ferric Chloride stain is observed.

Photo EP-14: Bio-gas Holding Tank #1 (to the west of Sludge Consolidation Tanks) in East Plant - The tank is located on concrete paved floor with no stressed vegetation/ leakage is observed. The tank is in good condition no damage/ leakage is observed.

Photo EP-15: Bio-gas Holding Tank #2 (to the west of Sludge Digestion Tanks) in East Plant – The tank is located on concrete paved floor with no stressed vegetation/ leakage is observed. The tank is in good condition no damage/ leakage is observed.

Photo EP-16: Screens House of East Plant (External View) -The house is located on concrete paved floor. Water stain is observed, no oil stain/leakage is observed.

Photo EP-17: Screen House – The first floor of the screen house is located above ground level with concrete paved floor in good condition, no stain is observed.

Photo EP-18: Inlet Pumping Station of East Plant (External View of Screw Pumps) – The pumps are located on concrete paved floor at 3.4 m above the ground level. All accessible surfaces around the pumps are paved with concrete, steel panels are installed to prevent spillage. No observation of oil stain/ leakage is anticipated.

Photo EP-19: Combined Heat and Power Generating System of East Plant – The system is located on concrete paved floor with vegetation surrounding. No stressed vegetation is observed and the system is in good condition with no damage observed. No oil stain/ leakage is observed in the area.

Photo EP-20: Primary Sludge Gravity Thickener of East Plant – The thickener is located on concrete paved floor surrounding by vegetation. The condition of the floor is good, no damage observed, and the gravity thicker is well-maintained. No leakage/ stressed environment is observed.

Photo EP-21: Decanting Chamber – The chamber is located on concrete paved floor connecting to the Primary Sludge Gravity Thickener surrounding by vegetation. There is no stressed vegetation/ leakage is observed. The chamber is in good condition where no damage or large area of dirty stain is found.

Lubricant Oil Store consists of a Gear Oil Station and a Lubricant Oil Storage Room

Photo EP-22: Lubricant Oil Store (Gear Oil Station) – The Gear Oil Station is an open storage area on concrete paved floor around the Lubricant Oil Storage Room as part of the Lubricant Oil Store (near the Central Building Complex). Stockpiles of wastes and some empty oil tanks were located in the Gear Oil Station (outdoor). Oil stain was observed in this area. Potential land contamination issue is anticipated.

Photo EP-22a: Lubricant Oil Store (Gear Oil Station) - Spent chemical waste Is stored in this location.

Photo EP-23: Lubricant Oil Store (Lubricant Oil Storage Room) – Lubricant Oil are stored inside the room on steel panel and concrete paved floor. Some Lubricant oil area stored on steel racks. Oil stain /leakage is observed on the floor of the Lubricant Oil Store. Potential land contamination issue is anticipated.

Photo EP-24: Lubricant Oil Store (Lubricant Oil Storage Room) – The floor of the room is paved with concrete and steel panel. Oil stain and leakage is observed on the floor of the storage room. Spillage is observed during the site walk. Potential land contamination issue is anticipated.

Photo EP-25: Combined Heat and Power Generating System of East Plant – The system is located on concrete paved floor with vegetation surrounding. No stressed vegetation is observed and the system is in good condition with no damage observed. No oil stain/ leakage is observed in the area. Rusty stain is observed in this location.

Photo EP-26: Central Building Complex (External View) – The complex is a two-storey building and is located on concrete paved floor. No oil stain/leakage was observed in this location.

Photo EP-27: Central Building Complex – The Control Panel is located on the first floor of the Central Building Complex on concrete paved floor in good condition. No oil stain/leakage is observed in this location.

Photo EP-28: Central Building Complex – The first floor of the Central Building Complex is paved with concrete and some equipment were stored here inside the wooden box/on the wooden panel. Some other equipment are placed on the floor. No oil stain/leakage is observed.

Photo EP-29: Waste Bio-Gas Burner – The burner is located on an elevated platform with concrete slab on concrete paved floor. Fuel oil tanks are within bunded area and protected by concrete slab. No oil stain/ leakage is observed.

Photo EP-30: Gas Transfer Station – The Gas Transfer Station is located on concrete paved floor next to the Screen House. No oil stain / leakage is observed in this location.

Photo EP- 31: Bio-Gas Holding Tank Valve Chamber – The Ferric Chloride Dosing System is located on elevated platform next to the Bio-gas Holding Tank. Water stain is observed, no oil stain/leakage is observed.

Photo EP-32: External View of the Service Tower Building – The Service Tower Building is located on concrete paved floor, it is a three-storey building. No oil stain/leakage is observed.

Photo EP-33: Service Tower Building – The ground floor of the Service Tower Building is paved with concrete. Pumps are connected to the Sludge Digestion Tanks of East Plant outside the Tower. Rusty stain is observed, no oil stain/ leakage is observed.

Photo EP-34: Service Tower Building - The ground floor of the Service Tower Building is located on concrete paved floor. Water stain is observed due to handling of sludge. No oil stain/leakage is observed.

Photo EP-37: Detritors – The 2 Detritors are located on elevated slope with a concrete paved platform surrounding by vegetation. No oil stain/ leakage is observed.

Photo EP-38: Primary Sedimentation Tank Distribution Chamber – The Primary Sedimentation Tank Distribution Chamber is connected to the two Detritors on the elevated slope with a concrete paved platform surrounding by vegetation. No oil stain/ leakage is observed.

Photo EP-39: Screen House – One Generator Daily Fuel Tank (450 L)
Is located within the Screen House. The floor is paved with concrete slab. The Generator Daily Fuel Tank is located in bund wall constructed with an elevated concreate platform. No oil stain/leakage is observed in this located.

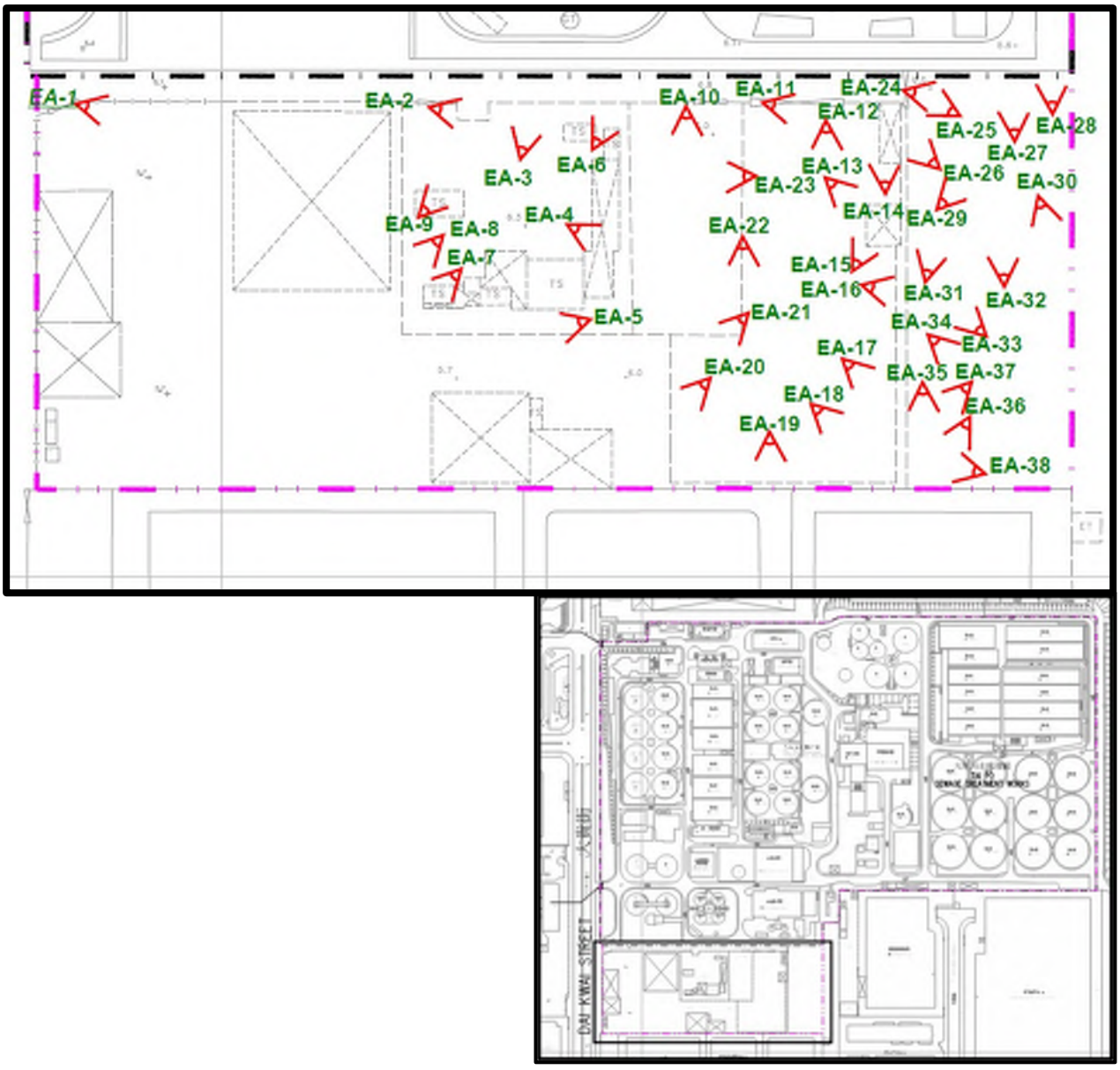
Photo EP-40:Screen House –Emergency generators are located within the Screen House. The floor is paved with concrete slab next to the Generator Daily Fuel Tank on elevated concrete paved platform. No oil stain/leakage is observed in this located.

Photo EP-41: Chemical Store – The chemical store is located on concrete paved floor. No oil stain/ leakage is observed.

Photo EP-42: Chemical Store – Leatheroid are found on steel panel inside the chemical store above concrete paved floor. Some leatheroid are located on wooden panel. No oil stain/leakage is observed.

Photo EP-43: Chemical Store -Caustic Soda (about 14 drums) are found inside the chemical store on steel panel above the concrete paved floor. No oil stain/leakage is observed.

Proposed Expansion Site – Index Plan



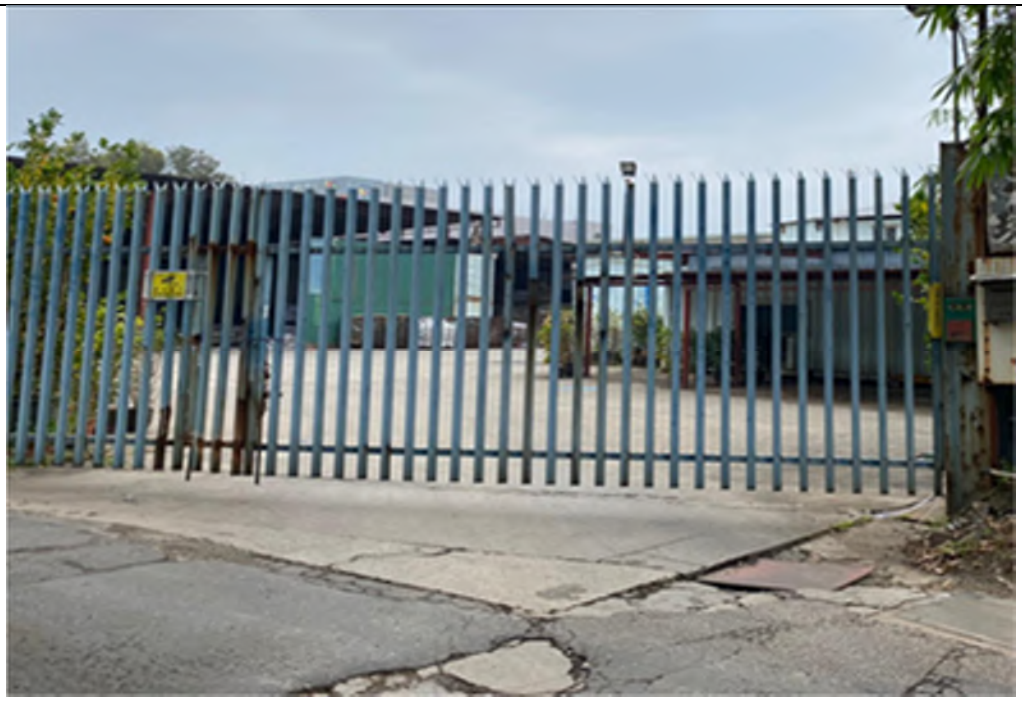


Photo EA-1: Lot No. STT 1449 - Existing Canny Star Environmental Protection Limited in the proposed expansion site. The site near the entrance appeared clean and tidy.

Photo EA-2: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Entrance) – The floor is paved with concrete with no oil stain/stressed vegetation observed.

Photo EA-3: Lot No. GLA-TPP 776 – Existing DSD's and Contractor's Site Office (Waste Storage Area) – General waste and garbage are stored on concrete paved floor with no leakage. No chemical storage is allowed in the area.

Photo EA-4: Lot No. GLA-TPP 776 – Existing DSD's and Contractor's Site Office (Staff Resting Area) – The area is paved with concrete floor with no oil stain observed.

Photo EA-5: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Planting Area) – The planting area is in good condition, no oil stain/stressed vegetation is observed.

Photo EA-6: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Storage Area) - No oil stain/stressed vegetation is observed. No chemical storage is allowed in the area.

Photo EA-7: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Storage Area) – Equipment are stored on racks. The floor is paved with concrete in good condition. No oil stain is observed. No chemical is stored in the area.

Photo EA-8: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Store Room) – The tools and cement are placed on wood panel, and the floor is paved with concrete . No oil stain/ floor leakage is observed. No chemical is stored in the area.

Photo EA-9: Lot No. GLA-TPP 776 - Existing DSD's and Contractor's Site Office (Store Room) -Tools are stored on the racks and in the plastic buckets. The floor is paved with concrete. No oil stain/ floor leakage is observed. No chemical is stored in the area.

Photo EA-10: Existing Vacant Land (Previously Lot No. GLA-TPP 786 - CEDD's Site Office) – The land is paved with concrete floor in good condition with no oil stain observed.

Photo EA-11: Lot No. STT 1450 - Existing C & H Import & Export Co. (Entrance) – The floor is paved with concrete and covered with iron shard. Cars were parked in the area.

Photo EA-12: Lot No. STT 1450 – Existing C & H Import & Export Co. – The site floor (viewing from entrance) is paved with concrete and covered with iron shard. Large machineries were operated on-site. Stockpiles of metal wastes were observed.

Photo EA-13: Lot No. STT 1450 - Existing C & H Import & Export Co. - Metal wastes were lying around the site. Most ground surfaces were covered with wastes and debris.

Photo EA-14: Lot No. STT 1450 - Existing C & H Import & Export Co. - Acetylene cylinders are stored in a wood cupboard.

Photo EA-15: Lot No. STT 1450 - Existing C & H Import & Export Co. – Material storage area was observed

Photo EA-16: Lot No. STT 1450 - Existing C & H Import & Export Co. - Material storage area was observed

Photo EA-17: Lot No. STT 1450 - Existing C & H Import & Export Co. – Most of the site surfaces were covered with equipment, wastes, debris and dirt.

Photo EA-18: Lot No. STT 1450 - Existing C & H Import & Export Co. – Open stockpiles of metal wastes were observed.

Photo EA-19: Lot No. STT 1450 - Existing C & H Import & Export Co. – Open stockpiles of metal wastes were observed.

Photo EA-20: Lot No. STT 1450 - Existing C & H Import & Export Co. – Engine oils (stored in tanks) were placed at the edge of a sheltered area together with other large pieces of equipment and tools, with no bund wall and no secondary containment. Stockpiles of metal wastes and machineries were found in open area.

Photo EA-21: Lot No. STT 1450 - Existing C & H Import & Export Co. – Metal wastes and debris were observed in open site area.

Photo EA-22: Lot No. STT 1450 - Existing C & H Import & Export Co. – Car road is paved with concrete. Debris and stains were observed on road surfaces.

Photo EA-23: Lot No. STT 1450 - Existing C & H Import & Export Co. - Engine oils are stored in tanks in open area with no bund wall and no secondary containment.

Photo EA-24: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited (Entrance) – Stockpiles of waste materials were observed.

Photo EA-25: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Water Stain, debris were observed on the unpaved floor within the site area. Vegetation were found along the boundary of the site area. Overflowing rubbish bin was found near the entrance of the site. No oil stain/ leakage is found in this location.

Photo EA-26: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Stockpiles of plastic waste cubes were located on the site's unpaved floor. Water stain and debris were observed on the floor. Cracks were observed on the floor and vegetation were observed along the boundary. No oil stain /leakage was observed in this area.

Photo EA-27: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Debris were observed all over the site area, dirty stain and stockpile of cardboards were observed on the unpaved floor. There was a car parked in this area. No oil stain/leakage is observed in this location.

Photo EA-28: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Dirty stain, dying vegetation and debris were found in this area near the cargo on the unpaved floor.

Photo EA-29: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Machine was located in open area on the unpaved floor within the site area. Debris and dirty stain were found in this location.

Photo EA-30: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Waste cardboards, debris were found scattered all over the site area on unpaved floor. Dirty stain was observed in this area, with no oil stain/ leakage observed in this location.

Photo EA-31: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Equipment and machine not in operation were located under shelter. Some plastic wastes were being put in this area near the machine. A car was parked in this location. No oil stain/ spillage observed in this location.

Photo EA-32: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Fragment of plastic waste were being put into bags and located on the assessible road within the site area.

Photo EA-33: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited –Lubricant oil were stored on the unpaved floor . Oil stain was found in this location on unpaved floor with no panel or secondary containment. Potential land contamination issue is anticipated.

Photo EA-34 : Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – Plastic waste were found in this location near the plastic making machines. No oil stain/leakage is found in this location.

Photo EA-35: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – The plastic breaking machine was located inside a warehouse together with other machines on unpaved floor.

Photo EA-36: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – The plastic making machine was located inside the warehouse on unpaved floor. Fragment of plastic waste were observed scattered on the floor.

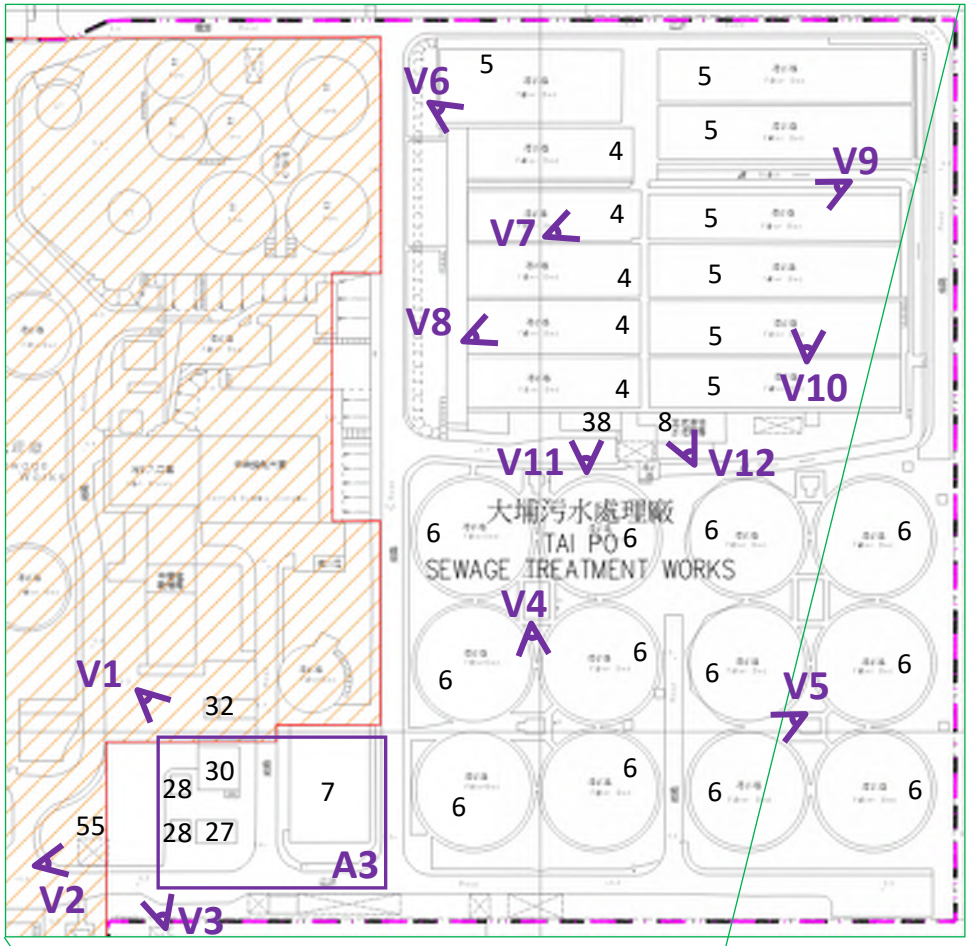
Photo EA-37: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – The plastic breaking machine was located on unpaved floor inside the warehouse, the fragment of plastic waste was scattered on the floor. No oil stain/ leakage was observed.

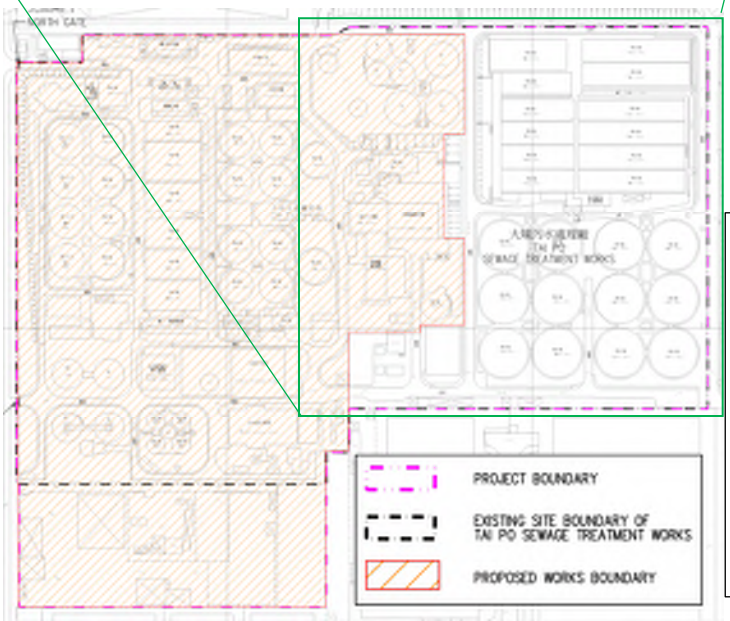
Photo EA-38: Lot No. STT 1745 - Existing Lau Choi Kee Plastic Company Limited – The waste water pumping machine was located outside the warehouse and shelters. Concrete made barriers were observed surrounding the machine on the floor to prevent water from leaking out. Dirty stain and debris were observed with no oil stain/leakage was observed.

ANNEX 2.4A

PHOTO RECORDS OF SURROUNDING AREAS IN TPSTW

Index Plan - Surrounding Areas in TPSTW





Selected TPSTW Facilities

4. Primary sedimentation tank
5. Aeration tank
6. Final sedimentation tank
7. SAS thickening house
8. Return activated sludge pumping station
27. Fire Services Shelter
28. Water Tank
30. Transformer House
32. Chemical Store
38. Switch room
55. Effluent sampling Shelter

Photo V1: TPSTW facilities outside the proposed excavation works limit, including the SAS Thickening House and Transformer House, are enclosed within concrete building.

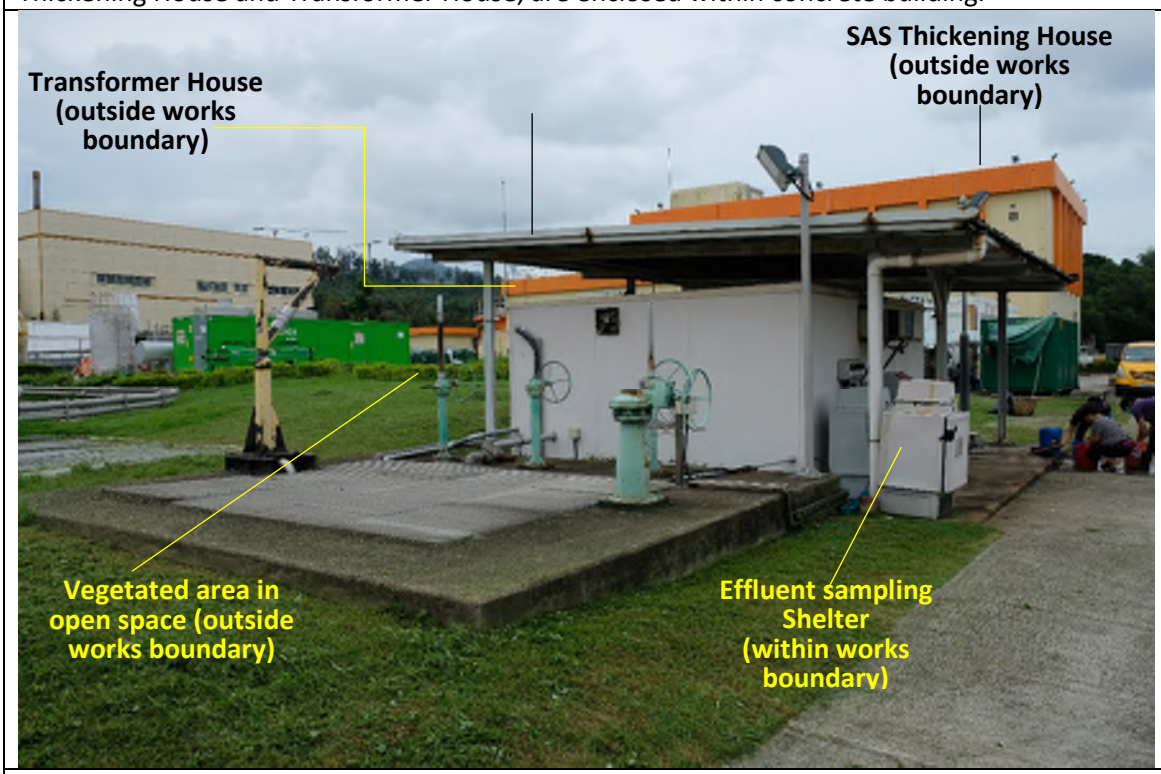


Photo V2: Open space outside the proposed excavation works limit are vegetated. No sign of land contamination (e.g. stressed vegetation) is identified.

Photo V3: Internal road and vegetated open space (outside the proposed excavation works limit) looked clean. No sign of land contamination is identified.

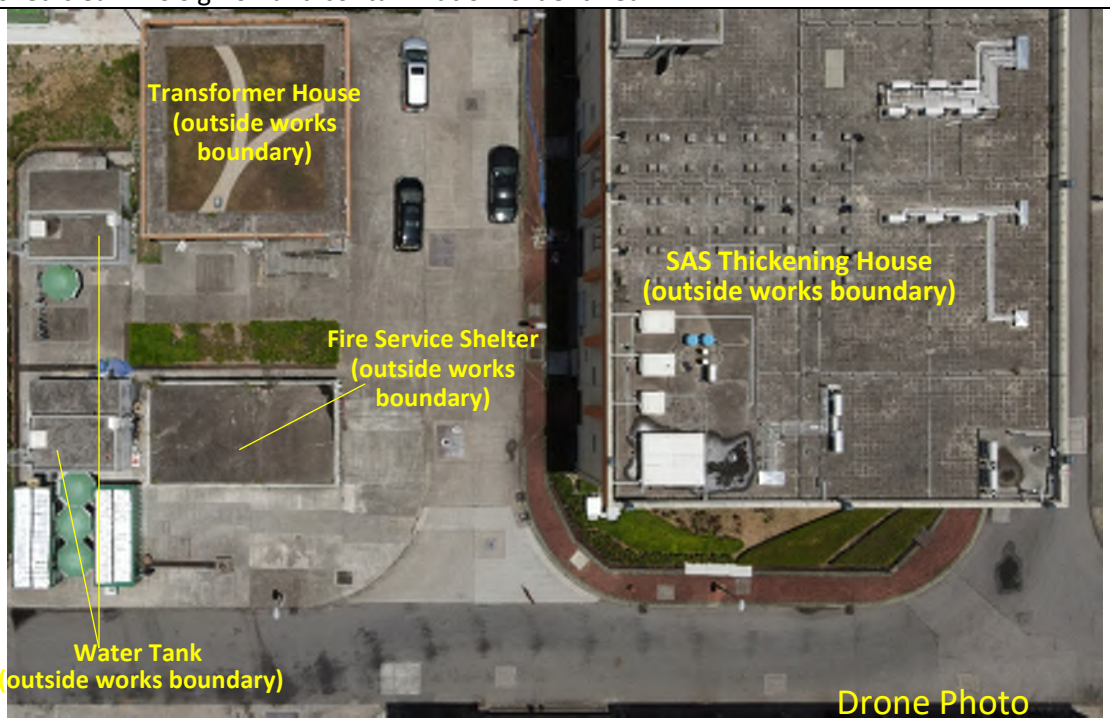


Photo A3: TPSTW facilities outside the proposed excavation works limit are enclosed within concrete buildings. No disturbance to these facilities is proposed. All buildings outside the works limit will remain intact. No land contamination issue associated with the Project works is identified.

Photo V4: The ground conditions around the final sedimentation tanks of the East Plant looked clean with no oil stains nor stressed vegetation observed.

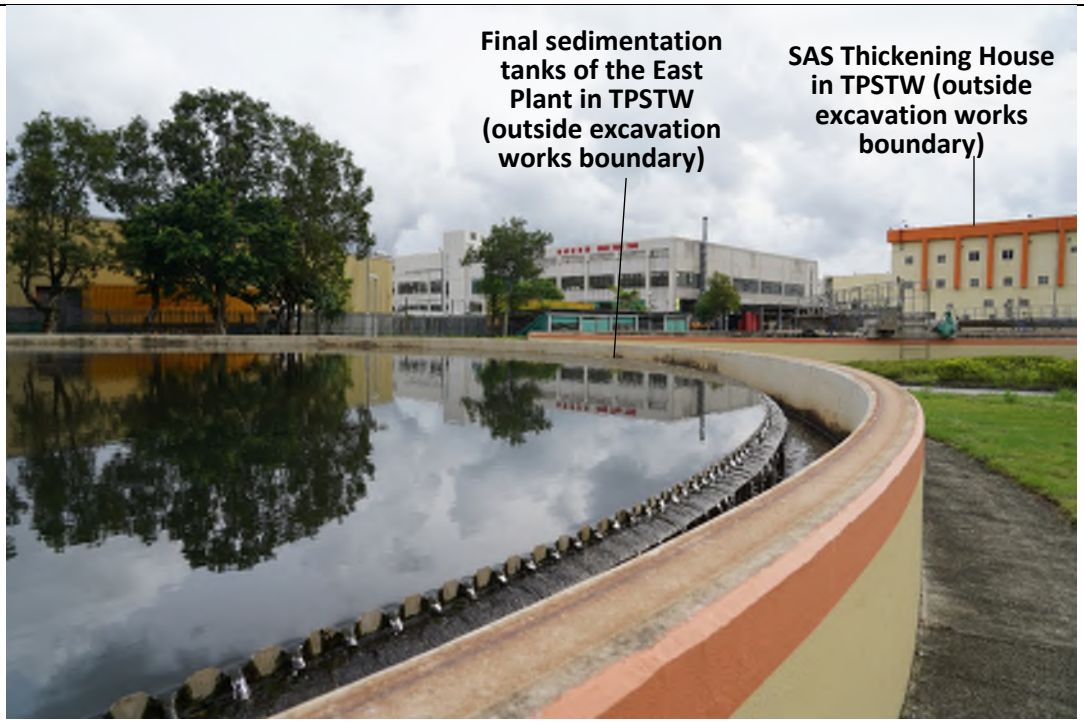


Photo V5: The ground conditions around the final sedimentation tanks of the East Plant looked clean with no oil stains nor stressed vegetation observed.

Photo V6: Primary Sedimentation Tanks of East Plant – The tanks are constructed with concrete on a raised slope. Only stain caused by weathering is observed, no oil stain/ leakage is observed in the area.

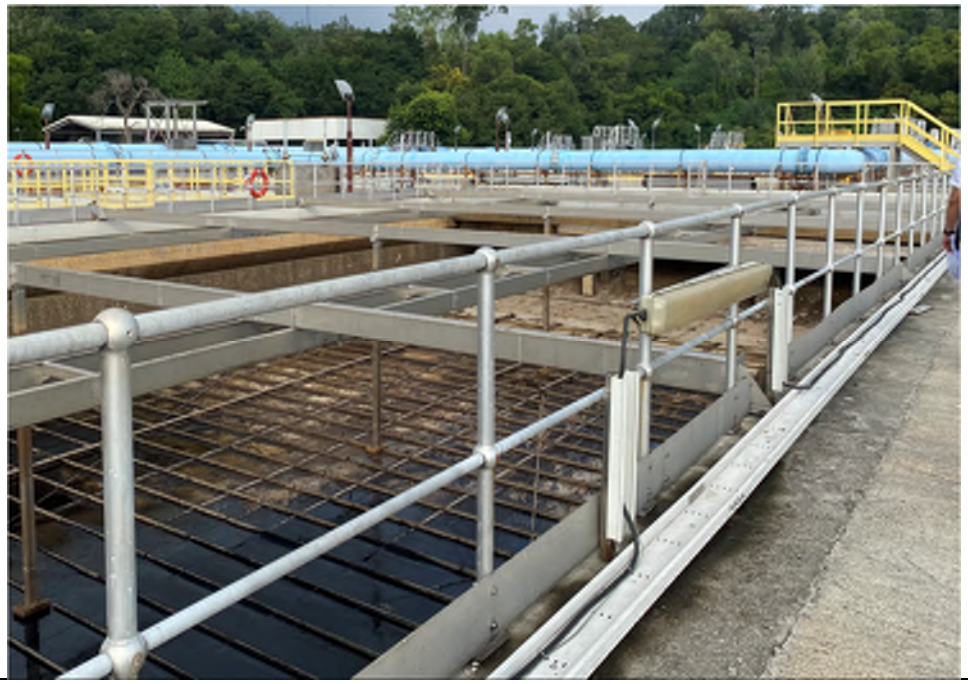


Photo V7: Primary Sedimentation Tanks of East Plant –The tanks are constructed with concrete, steel panel are installed in order to avoid spillage of sludge onto the passage road, and to prevent any substance from falling into the tanks. No leakage/ spillage is observed in the area.

Photo V8: Primary Sedimentation Tanks of East Plant – A tank was under maintenance. The tank is constructed with concrete. No observation of damage/ leakage is observed. Only water stain and stain caused by years of functioning is observed.

Photo V9: Aeration Tanks of East Plant – The tanks are constructed with concrete, and located below ground level. The assessable road is paved with concrete. Water stain caused by handling of sludge is observed, no oil stain/ spillage observed.

Photo V10: Aeration Tanks of East Plant– The tanks are constructed with concrete, no broken or damage is observed. Just stain caused by weathering is observed.

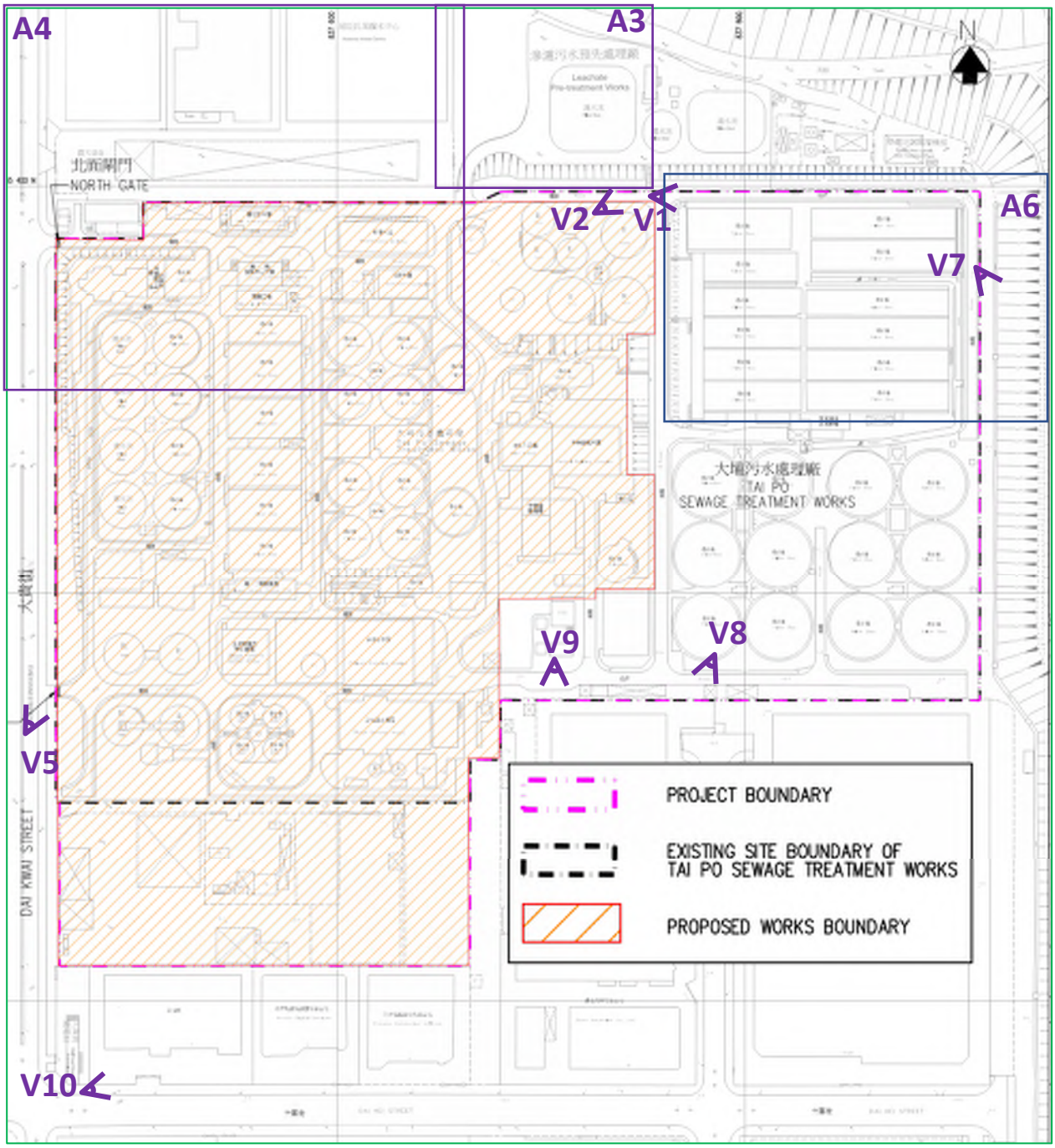
Photo V11 : Switch Room – The Switch Room is located on concrete paved floor, it is a one-storey building. No oil stain/leakage is observed.

Photo V12: Return Activated Sludge Pumping Station – The Station is located on floor paved with concrete, stain caused by weathering is observed. No oil stain/leakage is observed.

ANNEX 2.4B

PHOTO RECORDS OF AREAS SURROUNDING THE PROJECT SITE

Index Plan - Areas Surrounding the Project Site



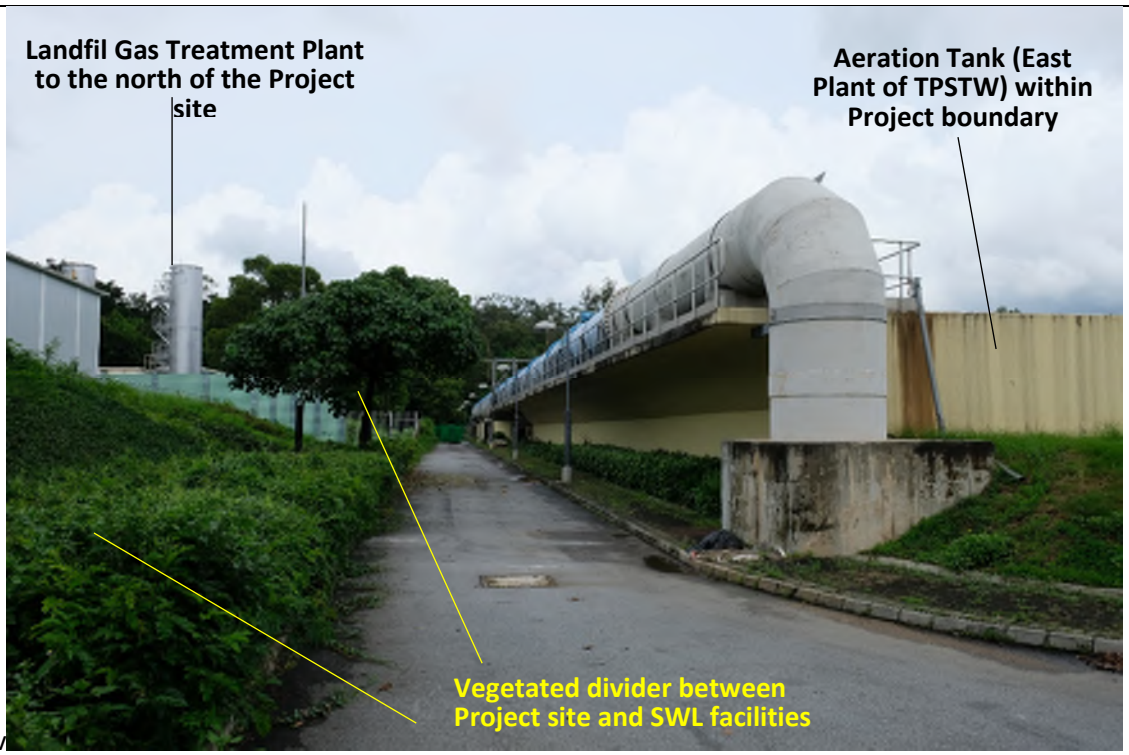


Photo V1: Areas to the immediate north of the Project site are vegetation. Further north are Shuen Wan Landfill (SWL) facilities. No sign of contamination such as stressed plant is iobserved.

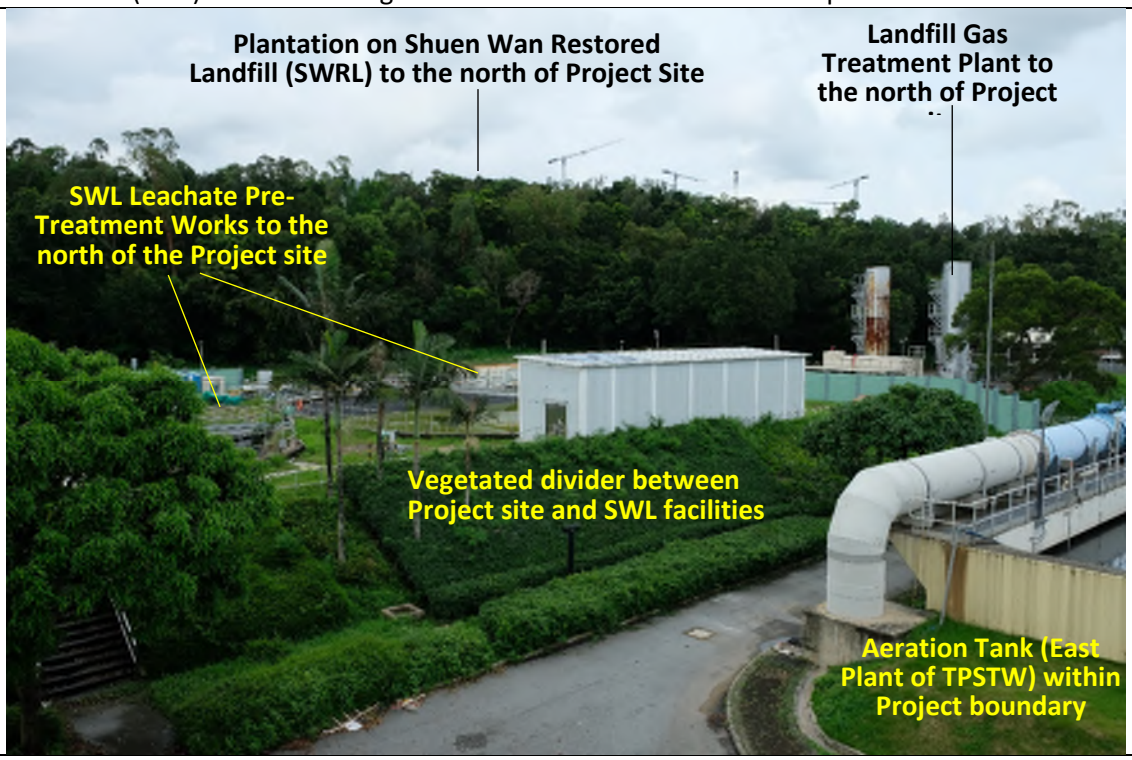


Photo V2: Areas to the north of the Project site are SWL Leachate Pre-treatment Works and SWL Gas Treatment Plant. Greening and vegetations are found within and around the SWL facilities. No land contamination issue associated with the Project works is identified.

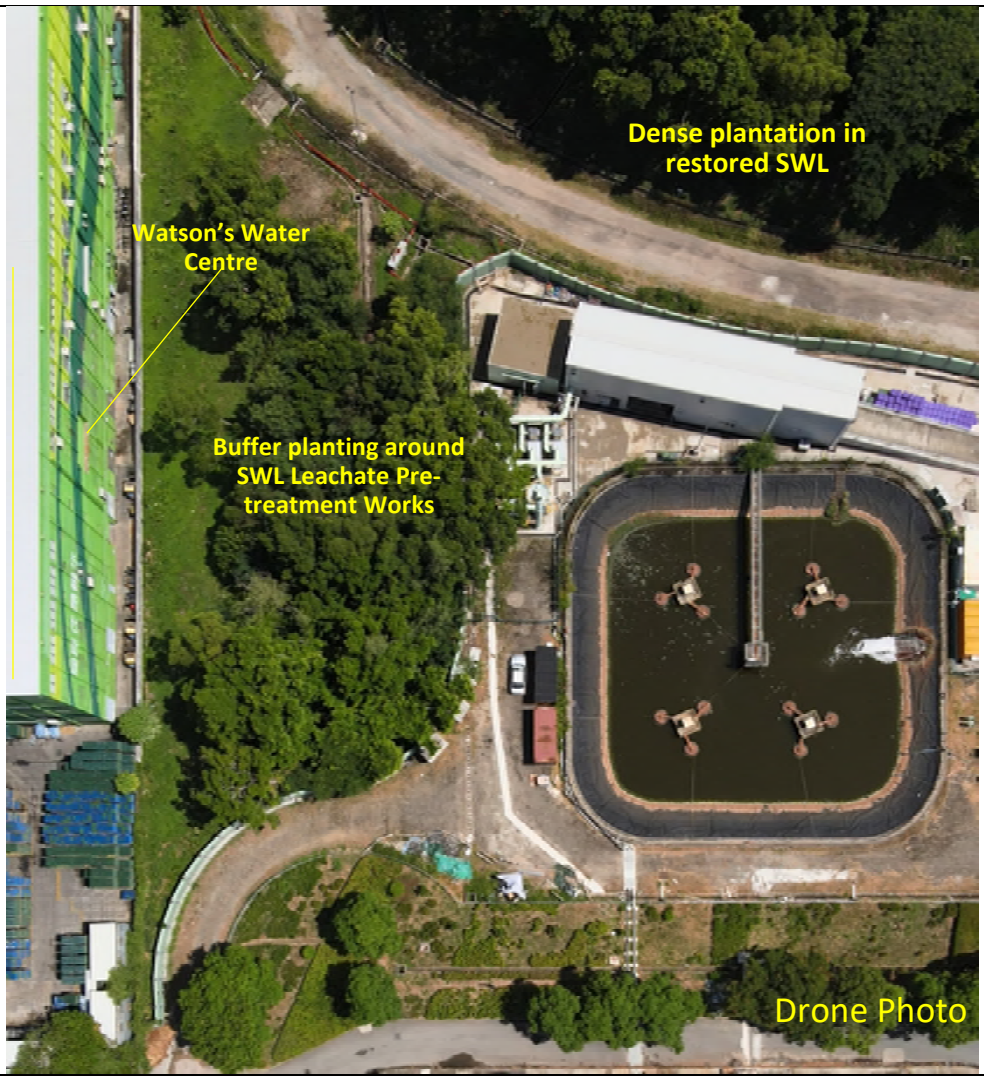


Photo A3: Leachate Pre-treatment Works to the north of the Project site are concrete paved. The Project works will not disturb the restored SWL facilities including the active leachate collection and multi-layer lining system. No land contamination issue associated with the Project works is identified.

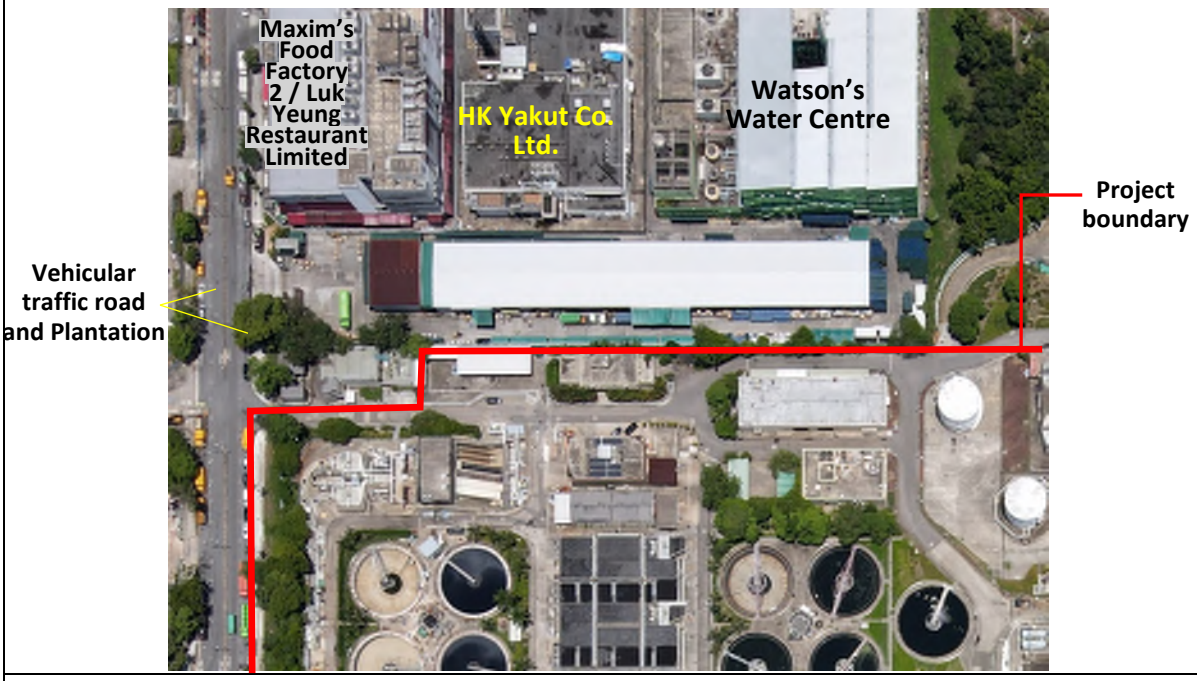


Photo A4: Areas to the north of the Project site also include three industrial buildings (Watson's Water Centre, Hong Kong Yakult Co. Lid. and Maxim's Food Factory /Luk Yeung Restaurant Limited). No disturbance to these buildings will be allowed. Areas to the east of the Project site are Tai Kwai Street. No land contamination issue associated with the Project works is identified.

Photo V5: Areas immediately to the west of the Project site is Tai Kwai Street and plantation. No land contamination issue is identified.

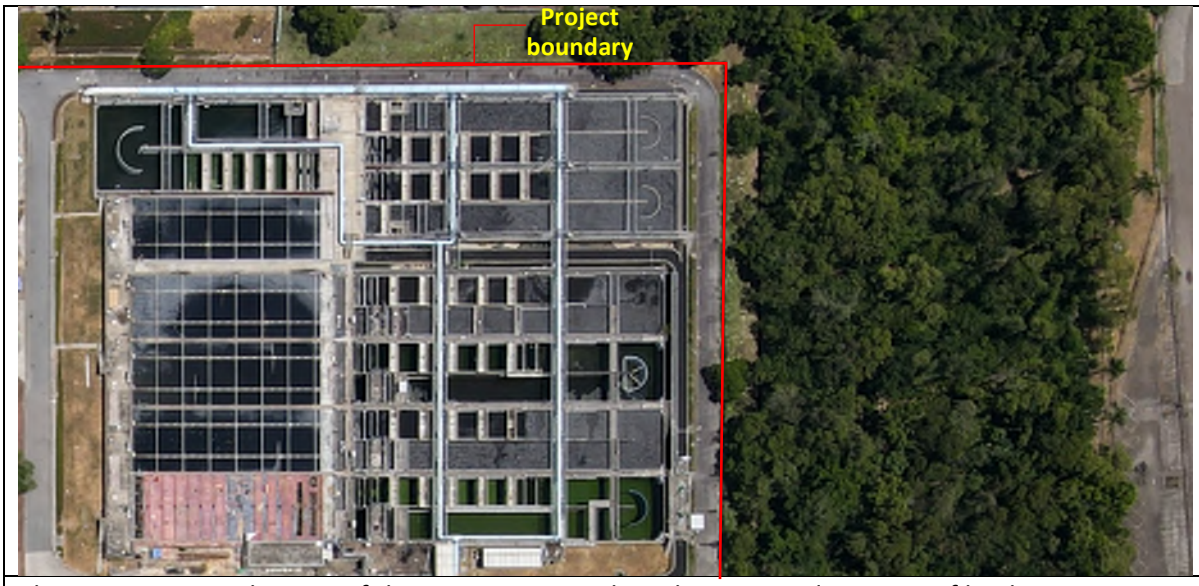


Photo A6: Area to the east of the Project site are heavily vegetated. No sign of land contamination issue is found.

Photo V7 Area to the east of the Project site are heavily vegetated. No sign of land contamination issue is found.

Photo V8 Hung Fook Tong Gounp Limited to the imeediate north of the Project site.

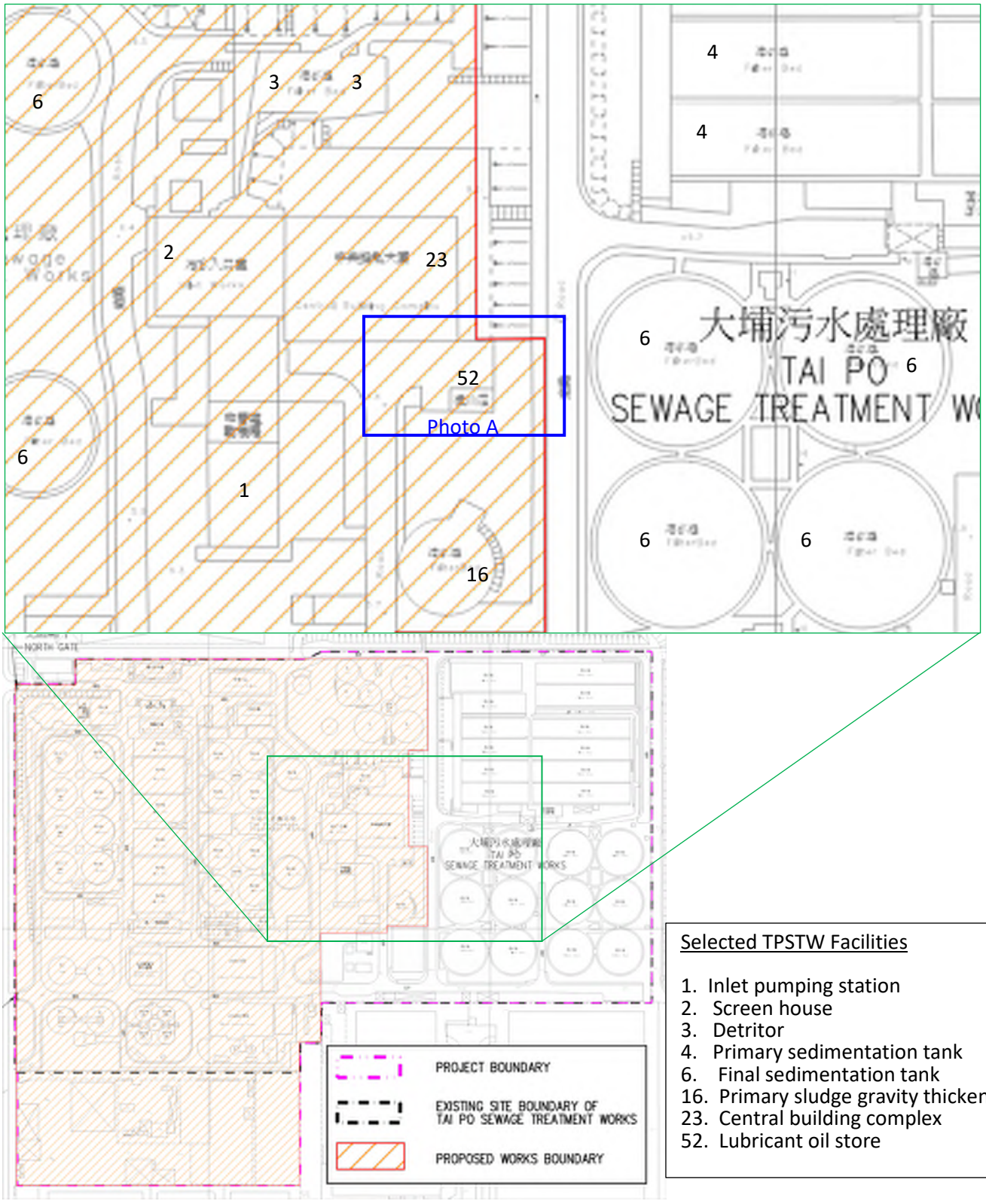
Photo V9: Areas around Hung Fook Tong Gounp Limited is vegetated and clean. No land contamination issue assoicated with the Project works is identified.

Photo V10: Areas immediately to south of the Project site are industrial buildings such as Tung Fong Hung Medicine Co. Ltd. and Sonopress. Industrial activities are contained within concrete buildings. Areas around these industrail buildings look clean and tidy. No land contamiantion issue is identified.

ANNEX 2.4C

AREA OF LUBRICANT OIL STORE

Index Plan - Lubricant Oil Store



Selected TPSTW Facilities

1. Inlet pumping station
2. Screen house
3. Detritor
4. Primary sedimentation tank
6. Final sedimentation tank
16. Primary sludge gravity thickener
23. Central building complex
52. Lubricant oil store

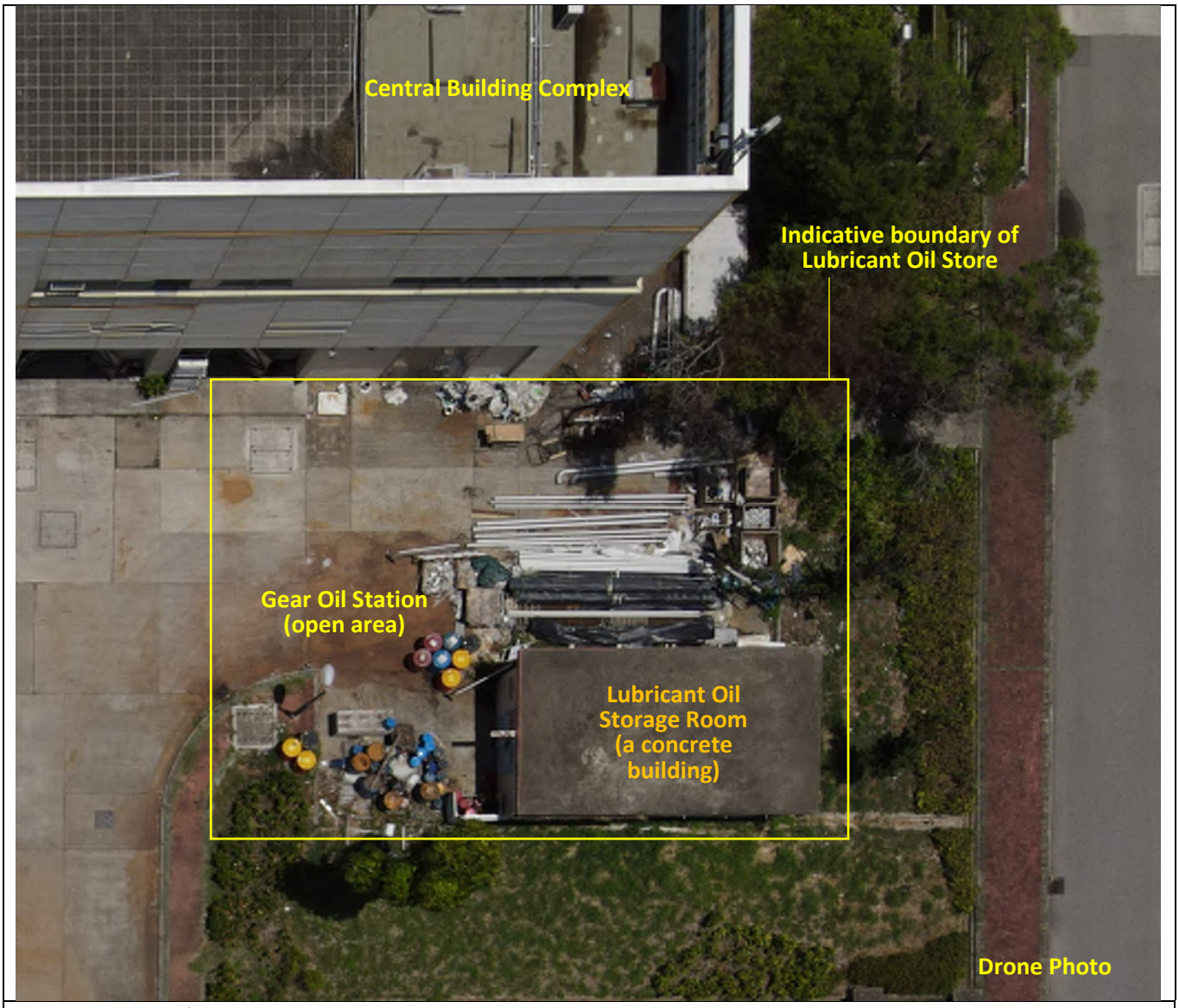


Photo A: Area of Lubricant Oil Store including a Gear Oil Station and a Lubricant Oil Storage Room.

ANNEX 2.5

RISK-BASED REMEDIATION GOALS (RBRGs)FOR SOIL AND SOIL SATURATION LIMIT AND FOR GROUNDWATER AND SOLUBILITY LIMIT

Table 2.1
Risk-Based Remediation Goals (RBRGs) for Soil & Soil Saturation Limit

Chemical	Risk-Based Remediation Goals (RBRGs) for Soil				Soil Saturation Limit (Csat) (mg/kg)
	Urban Residential (mg/kg)	**Rural Residential (mg/kg)**	**Industrial (mg/kg)**	**Public Parks (mg/kg)**	
VOCs					
Acetone	9,590	4,260	10,000*	10,000*	***
Benzene	0.704	0.279	9.21	42.2	336
Bromodichloromethane	0.317	0.129	2.85	13.4	1,030
2-Butanone	10,000*	10,000*	10,000*	10,000*	***
Chloroform	0.132	0.0529	1.54	253	1,100
Ethylbenzene	709	298	8,240	10,000*	138
Methyl tert-Butyl Ether	6.88	2.80	70.1	505	2,380
Methylene Chloride	1.30	0.529	13.9	128	921
Styrene	3,220	1,540	10,000*	10,000*	497
Tetrachloroethene	0.101	0.0444	0.777	1.84	97.1
Toluene	1,440	705	10,000*	10,000*	235
Trichloroethene	0.523	0.211	5.68	69.4	488
Xylenes (Total)	95.0	36.8	1,230	10,000*	150
SVOCs					
Acenaphthene	3,510	3,280	10,000*	10,000*	60.2
Acenaphthylene	2,340	1,510	10,000*	10,000*	19.8
Anthracene	10,000*	10,000*	10,000*	10,000*	2.56
Benzo(a)anthracene	12.0	11.4	91.8	38.3	--
Benzo(a)pyrene	1.20	1.14	9.18	3.83	--
Benzo(b)fluoranthene	9.88	10.1	17.8	20.4	--
Benzo(g,h,i)perylene	1,800	1,710	10,000*	5,740	--
Benzo(k)fluoranthene	120	114	918	383	--
Bis-(2-Ethylhexyl)phthalate	30.0	28.0	91.8	94.2	--
Chrysene	871	919	1,140	1,540	--
Dibenzo(a,h)anthracene	1.20	1.14	9.18	3.83	--
Fluoranthene	2,400	2,270	10,000*	7,620	--
Fluorene	2,380	2,250	10,000*	7,450	54.7
Hexachlorobenzene	0.243	0.220	0.582	0.713	--
Indeno(1,2,3-cd)pyrene	12.0	11.4	91.8	38.3	--
Naphthalene	182	85.6	453	914	125
Phenanthrene	10,000*	10,000*	10,000*	10,000*	28.0
Phenol	10,000*	10,000*	10,000*	10,000*	7,260
Pyrene	1,800	1,710	10,000*	5,720	--
Metals					
Antimony	29.5	29.1	261	97.9	--
Arsenic	22.1	21.8	196	73.5	--
Barium	10,000*	10,000*	10,000*	10,000*	--
Cadmium	73.8	72.8	653	245	--
Chromium III	10,000*	10,000*	10,000*	10,000*	--
Chromium VI	221	218	1,960	735	--
Cobalt	1,480	1,460	10,000*	4,900	--
Copper	2,950	2,910	10,000*	9,790	--
Lead	258	255	2,290	857	--
Manganese	10,000*	10,000*	10,000*	10,000*	--
Mercury	11.0	6.52	38.4	45.6	--
Molybdenum	369	364	3,260	1,220	--
Nickel	1,480	1,460	10,000*	4,900	--
Tin	10,000*	10,000*	10,000*	10,000*	--
Zinc	10,000*	10,000*	10,000*	10,000*	--
Dioxins / PCBs					
Dioxins (I-TEQ)	0.001	0.001	0.005	0.001	--
PCBs	0.236	0.226	0.748	0.756	--
Petroleum Carbon Ranges					
C6 - C8	1,410	545	10,000*	10,000*	1,000
C9 - C16	2,240	1,330	10,000*	10,000*	3,000
C17 - C35	10,000*	10,000*	10,000*	10,000*	5,000
Other Inorganic Compounds					
Cyanide, free	1,480	1,460	10,000*	4,900	--
Organometallics					
TBTO	22.1	21.87	196	73.5	--

Notes:

(1) For Dioxins, the cleanup levels in USEPA Office of Solid Waste and Emergency Response (OSWER) Directive of 1998 have been adopted. The OSWER Directive value of 1 ppb for residential use has been applied to the scenarios of "Urban Residential", "Rural Residential", and "Public Parks", while the low end of the range of values for industrial, 5 ppb, has been applied to the scenario of "industrial".

(2) Soil saturation limits for petroleum carbon ranges taken from the Canada-Wide Standards for Petroleum Hydrocarbons in Soil, CCME 2000.

(3) * indicates a 'ceiling limit' concentration.

(4) *** indicates that the Csat value exceeds the 'ceiling limit' therefore the RBRG applies.

Table 2.2
Risk-Based Remediation Goals (RBRGs) for Groundwater and Solubility Limit

Chemical	Risk-Based Remediation Goals (RBRGs) for Groundwater			Solubility Limit (mg/L)
	Urban Residential (mg/L)	Rural Residential (mg/L)	Industrial (mg/L)	
VOCs				
Acetone	10,000*	10,000*	10,000*	***
Benzene	3.86	1.49	54.0	1,750
Bromodichloromethane	2.22	0.871	26.2	6,740
2-Butanone	10,000*	10,000*	10,000*	***
Chloroform	0.956	0.382	11.3	7,920
Ethylbenzene	1,020	391	10,000*	169
Methyl tert-Butyl Ether	153	61.1	1,810	***
Methylene Chloride	19.0	7.59	224	***
Styrene	3,020	1,160	10,000*	310
Tetrachloroethene	0.250	0.0996	2.95	200
Toluene	5,110	1,970	10,000*	526
Trichloroethene	1.21	0.481	14.2	1,100
Xylenes (Total)	112	43.3	1,570	175
SVOCs				
Acenaphthene	10,000*	7,090	10,000*	4.24
Acenaphthylene	1,410	542	10,000*	3.93
Anthracene	10,000*	10,000*	10,000*	0.0434
Benzo(a)anthracene	--	--	--	--
Benzo(a)pyrene	--	--	--	--
Benzo(b)fluoranthene	0.539	0.203	7.53	0.0015
Benzo(g,h,i)perylene	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--
Bis-(2-Ethylhexyl)phthalate	--	--	--	--
Chrysene	58.1	21.9	812	0.0016
Dibenzo(a,h)anthracene	--	--	--	--
Fluoranthene	10,000*	10,000*	10,000*	0.206
Fluorene	10,000*	10,000*	10,000*	1.98
Hexachlorobenzene	0.0589	0.0234	0.695	6.20
Indeno(1,2,3-cd)pyrene	--	--	--	--
Naphthalene	61.7	23.7	862	31.0
Phenanthrene	10,000*	10,000*	10,000*	1.00
Phenol	--	--	--	--
Pyrene	10,000*	10,000*	10,000*	0.135
Metals				
Antimony	--	--	--	--
Arsenic	--	--	--	--
Barium	--	--	--	--
Cadmium	--	--	--	--
Chromium III	--	--	--	--
Chromium VI	--	--	--	--
Cobalt	--	--	--	--
Copper	--	--	--	--
Lead	--	--	--	--
Manganese	--	--	--	--
Mercury	0.486	0.184	6.79	--
Molybdenum	--	--	--	--
Nickel	--	--	--	--
Tin	--	--	--	--
Zinc	--	--	--	--
PCBs				
Dioxins (I-TEQ)	--	--	--	--
PCBs	0.433	0.171	5.11	0.031
Petroleum Carbon Ranges				
C6 - C8	82.2	31.7	1,150	5.23
C9 - C16	714	276	9,980	2.80
C17 - C35	12.8	4.93	178	2.80
Other Inorganic Compounds				
Cyanide, free	--	--	--	--
Organometallics				
TBTO	--	--	--	--

Notes:

(1) Blank indicates that RBRG could not be calculated because the toxicity or physical/chemical values were unavailable, or the condition of Henry's Law Constant > 0.00005 was not met for the inhalation pathway.

(2) Water solubilities for Petroleum Carbon Range aliphatic C9-C16 and greater than C16 generally are considered to be effectively zero and therefore the aromatic solubility for C9-C16 is used.

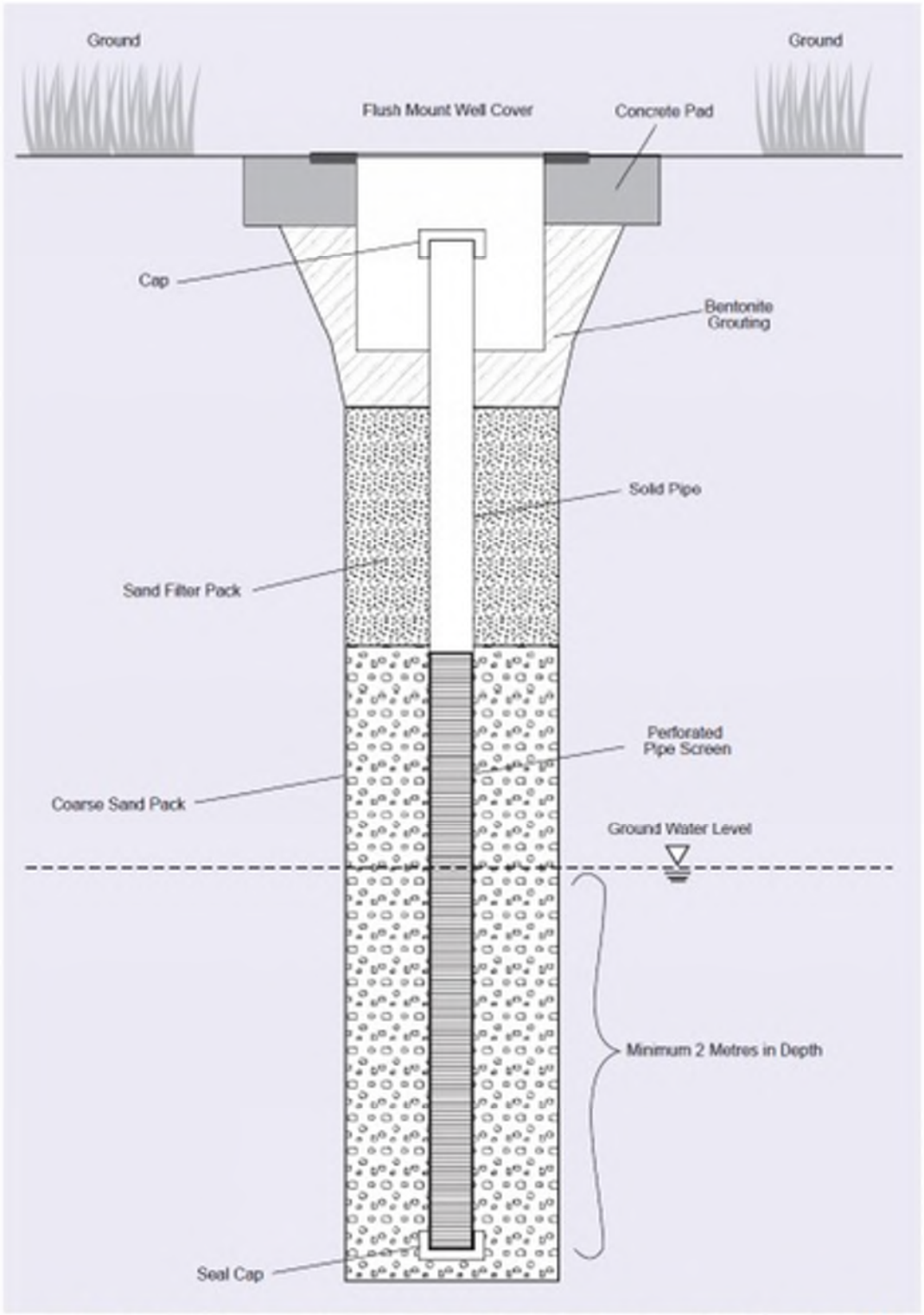
(3) * indicates a 'ceiling limit' concentration.

(4) *** indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies.

ANNEX 2.6

TYPICAL DESIGN OF A GROUNDWATER MONITORING WELL

Typical Design of a Groundwater Monitoring Well

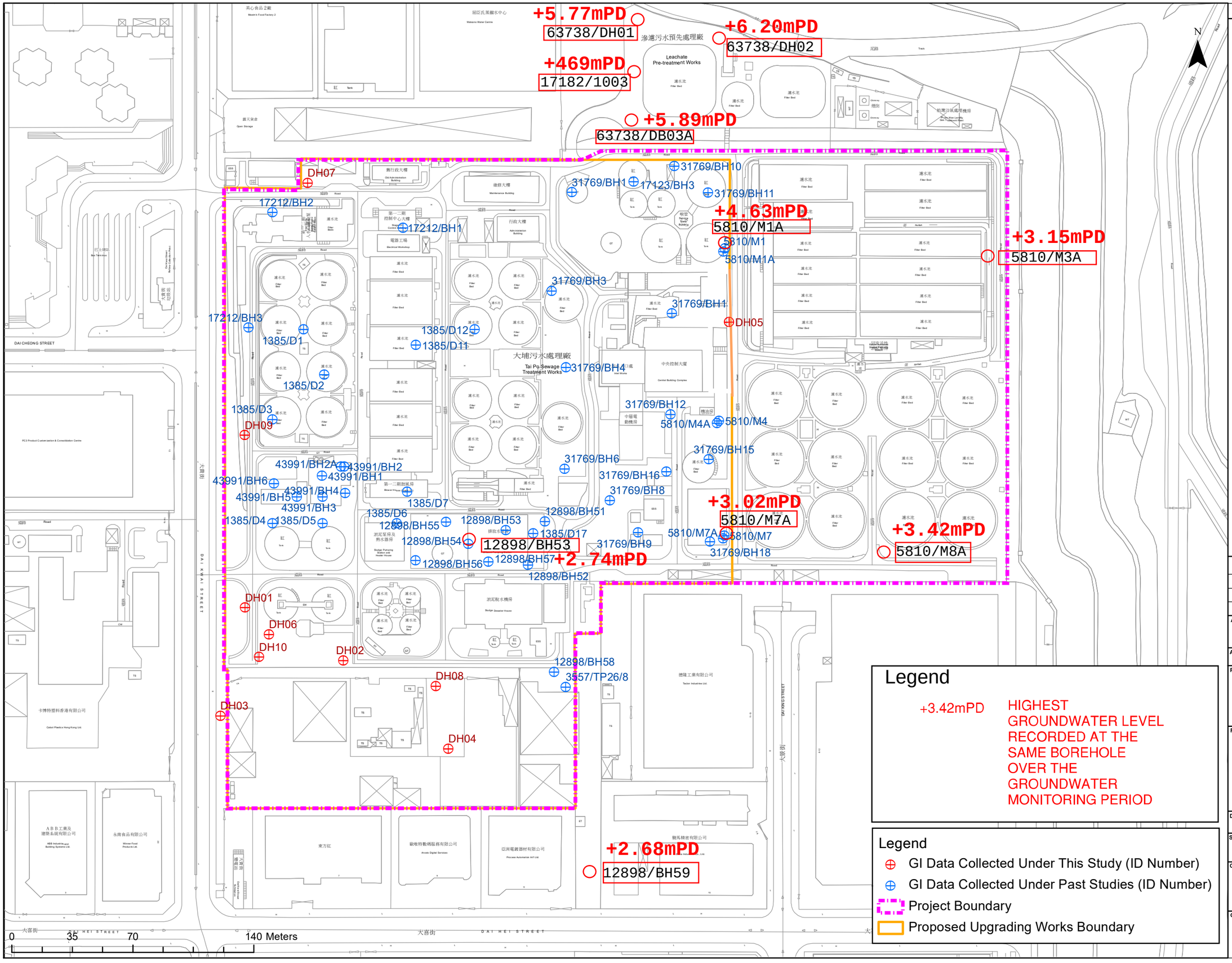


Source: Practice Guide for Investigation and Remediation of Contaminated Land, EPD, Aug. 2011

ANNEX 2.7

GROUND INVESTIGATION RECORDS

A3



Legend

+3.42mPD HIGHEST GROUNDWATER LEVEL RECORDED AT THE SAME BOREHOLE OVER THE GROUNDWATER MONITORING PERIOD

Legend

- GI Data Collected Under This Study (ID Number)
- GI Data Collected Under Past Studies (ID Number)
- Project Boundary
- Proposed Upgrading Works Boundary

Revision	Description			
	Designed	Reviewed	Drawn	Checked
Initial	PSY	Amy	PSY	Amy
Date	8/21	8/21	8/21	8/21

Approved: -

Agreement No.: CE 50/2019 (DS)

Project Title: **Upgrading of Tai Po Sewage Treatment Works - Investigation**

Figure Title: **Existing Ground Investgation Record**

Drawing No.: Appendix 2.7

Revision: -

Scale: A3: 1:2,000

Client: 渠務署 Drainage Services Department

Consultant: binnies

Summary of Existing Ground Investigation Records

Depth of Strata Encountered (mPD)

Report No.	GI Station No.	Easting	Northing	Ground Level (mPD)	Max Depth of GI Stations (mPD)	FILL			FILL Thickness	Marine Deposit			MD Thickness	Estuarine Deposit (ED)			ED Thickness
5810	M1	837750.98	835339.07	5.78	-32.90	5.78	-	-7.02	12.80	-7.02	-	-9.02	2.00		-		
	M1A	837751.84	835340.92	5.80	-8.40	5.80	-	-6.40	12.20	-6.40	-	-8.40	2.00		-		
	M4	837748.42	835241.24	5.90	-34.07	5.90	-	-10.10	16.00	-10.10	-	-11.10	1.00		-		
	M4A	837747.31	835239.74	5.85	-13.80	5.85	-	-13.15	19.00		-				-		
	M7	837750.90	835173.04	5.90	-32.71	5.90	-	-8.00	13.90	-8.00	-	-11.00	3.00		-		
	M7A	837751.47	835174.77	6.04	-10.96	6.04	-	-9.61	15.65	-9.61	-	-10.09	0.48		-		
1385	D1	837508.00	835294.00	5.30	-12.70	5.30	-	-8.70	14.00	-8.70	-	-10.20	1.50				
	D2	837520.00	835268.00	5.20	-10.90	5.20	-	-10.90	16.10		-						
	D3	837490.00	835242.00	4.90	-9.80	4.90	-	-9.80	14.70		-						
	D4	837490.00	835182.00	5.70	-15.30	5.70	-	-1.30	7.00	-1.30	-	-11.30	10.00				
	D5	837519.00	835182.00	5.50	-15.50	5.50	-	-1.50	7.00	-1.50	-	-11.50	10.00				
	D6	837562.00	835182.00	5.60	-15.40	5.60	-	1.60	4.00	1.60	-	-10.40	12.00				
	D7	837568.00	835200.00	5.40	-12.60	5.40	-	-0.30	5.70	-0.30	-	-12.60	12.30				
	D11	837573.00	835285.00	5.70	-9.30	5.70	-	-9.30	15.00		-						
	D12	837607.00	835294.00	5.70	-12.30	5.70	-	-11.30	17.00								
	D17	837641.00	835176.00	5.50	-15.50	5.50	-	-3.40	8.90	-3.40	-	-14.50	11.10				
12898	BH51	837647.74	835182.94	5.62	-52.93	5.62	-	-5.38	11.00	-5.38	-	-16.38	11.00				
	BH52	837637.81	835157.78	5.85	-57.11	5.85	-	-10.90	16.75	-10.90	-	-15.90	5.00				
	BH53	837625.00	835178.07	6.04	-66.64	6.04	-	-9.06	15.10	-9.06	-	-11.46	2.40				
	BH54	837603.29	835170.13	6.02	-56.50	6.02	-	-1.98	8.00	-1.98	-	-5.98	4.00				
	BH55	837590.50	835182.80	5.85	-55.99	5.85	-	-3.65	9.50	-3.65	-	-12.65	9.00				
	BH56	837572.87	835160.62	6.26	-48.86	6.26	-	-9.24	15.50	-9.24	-	-14.19	4.95				
	BH57	837614.97	835159.79	5.89	-9.11	5.89	-	-9.11	15.00								
	BH58	837652.99	835095.92	5.56	-9.44	5.56	-	-9.44	15.00								
3557	TP26/8	837659.80	835087.20	5.50	-20.45	5.50	-	-4.95	10.45	-4.95	-	-7.20	2.25				
43991	BH1	837518.64	835209.34	6.53	-48.40	6.53	-	-13.57	20.10								
	BH2	837529.76	835214.60	6.29	-52.62	6.29	-	-5.91	12.20		-			-5.91	-	-11.61	5.70
	BH2A	837531.48	835214.62	6.27	-11.43	6.27	-	-6.33	12.60		-			-6.33	-	-11.43	5.10
	BH3	837518.94	835197.25	6.50	-47.73	6.50	-	-3.60	10.10		-			-3.60	-	-11.20	7.60
	BH4	837532.12	835199.34	6.25	-49.25	6.25	-	-7.95	14.20		-			-7.95	-	-9.55	1.60
	BH5	837504.14	835197.36	6.54	-47.08	6.54	-	-5.56	12.10		-			-5.56	-	-12.66	7.10
	BH6	837490.84	835204.91	6.92	-56.18	6.92	-	-7.08	14.00		-			-7.08	-	-11.63	4.55
31769	BH1	837663.26	835373.20	5.78	-54.01	5.78	-	-8.22	14.00	-8.22	-	-8.72	0.50		-		
	BH3	837651.54	835316.22	5.60	-48.53	5.60	-	-10.90	16.50		-				-		
	BH4	837659.88	835272.20	5.92	-44.02	5.92	-	-11.58	17.50		-				-		
	BH6	837659.00	835213.23	5.73	-48.30	5.73	-	-12.27	18.00	-12.27	-	-12.77	0.50		-		
	BH8	837685.22	835195.20	6.36	-44.14	6.36	-	-4.34	10.70	-4.34	-	-13.34	9.00		-		
	BH9	837701.48	835176.51	6.41	-46.23	6.41	-	-9.59	16.00		-				-		
	BH10	837722.58	835388.36	5.84	-36.06	5.84	-	-5.86	11.70	-5.86	-	-9.96	4.10		-		
	BH11	837742.11	835373.06	5.83	-38.80	5.83	-	-7.77	13.60	-7.77	-	-9.87	2.10		-		
	BH12	837720.35	835245.00	7.61	-47.99	7.61	-	-10.09	17.70	-10.09	-	-13.09	3.00		-		
	BH13	837721.13	835303.11	9.65	-48.94	9.65	-	-10.35	20.00		-				-		
	BH15	837742.62	835218.76	6.29	-43.21	6.29	-	-8.41	14.70	-8.41	-	-11.41	3.00		-		
	BH16	837717.99	835211.73	6.39	-39.96	6.39	-	-7.21	13.60	-7.21	-	-11.21	4.00		-		
	BH18	837743.21	835171.48	6.56	-39.35	6.56	-	-9.04	15.60	-9.04	-	-10.44	1.40		-		
17212	BH1	837565.51	835352.80	5.78	-54.29	5.78	-	-10.22	16.00	-10.22	-	-11.22	1.00				
	BH2	837490.10	835361.55	8.14	-54.33	8.14	-	-8.86	17.00	-8.86	-	-9.86	1.00				
	BH3A	837476.21	835295.01	8.27	-52.85	8.27	-	-10.73	19.00		-						
	BH3	837698.96	835379.46	5.69	-44.01	5.69	-	-5.31	11.00	-5.31	-	-8.31	3.00				
Site Specific	DH01	837474.18	835133.09	5.67	-47.32	5.67	-	-10.13	15.80	-10.13	-	-11.33	1.20				
	DH02	837531.05	835102.60	6.18	-48.29	6.18	-	-11.17	17.35								
	DH03	837459.84	835070.64	5.65	-52.95	5.65	-	-8.85	14.50								
	DH04	837591.77	835051.57	6.84	-41.82	6.84	-	-11.18	18.02	-11.18	-	-14.26	3.08				
	DH05	837754.18	835298.29	5.68	-50.01	5.68	-	-14.17	19.85	-9.22	-	-11.32	2.10				
	DH06	837487.96	835117.79	6.36	-48.98	6.36	-	-9.54	15.90	-9.54	-	-10.85	1.31				
	DH07	837510.35	835378.53	5.43	-47.62	5.43	-	-10.97	16.40								
	DH08	837584.55	835087.77	6.83	-45.85	6.83	-	-10.57	17.40	-10.57	-	-11.67	1.10				
	DH09	837473.90	835232.83	7.30	-62.89	7.30	-	-10.80	18.10								
	DH10	837482.26	835104.66	5.79	-49.16	5.79	-	-10.91	16.70								

Report No.	GI Station No.	COLL			COLL Thickness	ALL			ALL Thickness	Residual Soil (RS)			RS Thickness	Debris Flow (DF)			DF Thickness
5810	M1		-		0.00	-9.02	-	-15.22	6.20		-				-		
	M1A		-				-				-				-		
	M4		-		0.00	-11.10	-	-14.50	3.40		-				-		
	M4A		-		0.00	-13.15	-	-13.80	0.65		-				-		
	M7		-		0.00	-11.00	-	-13.63	2.63		-				-		
	M7A		-		0.00	-10.09	-	-10.96	0.87		-				-		
1385	D1		-				-										
	D2		-				-										
	D3		-				-										
	D4		-		0.00	-11.30	-	-14.30	3.00								
	D5		-		0.00	-11.50	-	-14.50	3.00								
	D6		-		0.00	-10.40	-	-14.40	4.00								
	D7		-				-										
	D11		-				-										
	D12		-		0.00	-11.30	-	-12.30	1.00								
	D17		-				-										
12898	BH51		-		0.00	-16.38	-	-23.88	7.50								
	BH52		-		0.00	-15.90	-	-27.15	11.25								
	BH53		-		0.00	-11.46	-	-14.96	3.50								
	BH54		-		0.00	-5.98	-	-19.98	14.00								
	BH55		-		0.00	-12.65	-	-15.65	3.00								
	BH56		-				-										
	BH57																
	BH58																
3557	TP26/8		-		0.00	-7.20	-	-17.20	10.00	-17.20	-	-20.45	3.25				
43991	BH1		-				-										
	BH2		-		0.00	-11.61	-	-19.01	7.40		-				-		
	BH2A		-				-				-				-		
	BH3		-		0.00	-11.20	-	-14.20	3.00		-				-		
	BH4		-		0.00	-9.55	-	-13.65	4.10		-				-		
	BH5		-		0.00	-12.66	-	-13.26	0.60		-				-		
	BH6		-		0.00	-11.63	-	-14.63	3.00		-				-		
31769	BH1		-		0.00	-8.72	-	-13.22	4.50		-				-		
	BH3		-		0.00	-10.90	-	-13.90	3.00		-				-		
	BH4		-		0.00	-11.58	-	-15.08	3.50		-				-		
	BH6		-		0.00	-12.77	-	-15.77	3.00		-				-		
	BH8		-		0.00	-13.34	-	-14.44	1.10		-				-		
	BH9		-		0.00	-9.59	-	-15.59	6.00		-				-		
	BH10		-		0.00	-9.96	-	-12.96	3.00		-				-		
	BH11		-		0.00	-9.87	-	-12.97	3.10		-				-		
	BH12		-		0.00	-13.09	-	-16.09	3.00		-				-		
	BH13		-		0.00	-10.35	-	-14.45	4.10		-				-		
	BH15		-		0.00	-11.41	-	-15.51	4.10		-				-		
	BH16		-		0.00	-11.21	-	-14.21	3.00		-				-		
	BH18		-		0.00	-10.44	-	-14.54	4.10		-				-		
17212	BH1		-		0.00	-11.22	-	-14.22	3.00								
	BH2		-		0.00	-9.86	-	-13.86	4.00								
	BH3A		-		0.00	-10.73	-	-11.73	1.00								
	BH3		-		0.00	-8.31	-	-10.11	1.80					-10.11	-	-15.31	5.20
Site Specific	DH01	-13.33	-	-14.43	1.10	-11.33	-	-13.33	2.00								
	DH02					-11.17	-	-13.17	2.00								
	DH03					-8.85	-	-14.35	5.50								
	DH04					-14.26	-	-16.46	2.20								
	DH05																
	DH06																
	DH07					-10.97	-	-12.97	2.00								
	DH08					-11.67	-	-18.67	7.00								
	DH09					-10.80	-	-14.25	3.45								
	DH10					-10.91	-	-13.81	2.90								

Report No.	GI Station No.	CDG			CDG Thickness	CDV			CDV Thickness	HDG			HDG Thickness	HDV			HDV Thickness	MDG or above			MDV or above		
5810	M1		-			-15.22	-	-31.30	16.08		-				-				-		-31.30	-	-32.90
	M1A		-				-				-				-				-			-	
	M4		-			-14.50	-	-31.60	17.10		-			-31.60	-	-32.48	0.88		-		-32.48	-	-34.07
	M4A		-				-				-				-				-			-	
	M7		-			-13.63	-	-23.59	9.96		-			-23.59	-	-31.08	7.49		-		-31.08	-	-32.71
	M7A		-				-				-				-				-			-	
1385	D1																						
	D2		-				-																
	D3																						
	D4		-			-14.30	-	-15.30	1.00														
	D5		-			-14.50	-	-15.50	1.00														
	D6		-			-14.40	-	-15.40	1.00														
	D7		-				-																
	D11		-				-				-				-				-			-	
	D12		-				-				-				-				-			-	
	D17		-			-14.50	-	-15.50	1.00														
12898	BH51	-23.88	-	-47.58	23.70		-			-47.58	-	-52.93	5.35		-								
	BH52	-27.15	-	-52.08	24.93		-											-52.08	-	-57.11		-	
	BH53	-14.96	-	-61.54	46.58		-				-				-			-61.54	-	-66.64		-	
	BH54	-19.98	-	-51.18	31.20		-			-51.18	-	-51.58	0.40		-			-51.58	-	-56.50		-	
	BH55	-15.65	-	-50.75	35.10		-			-50.75	-	-51.96	1.21		-			-51.96	-	-55.99		-	
	BH56	-14.19	-	-43.79	29.60		-				-				-			-43.79	-	-48.86		-	
	BH57																						
	BH58																						
3557	TP26/8		-				-												-			-	
43991	BH1		-			-13.57	-	-40.47	26.90		-			-40.47	-	-43.27	2.80		-		-43.27	-	-48.40
	BH2		-			-19.01	-	-38.91	19.90		-			-38.91	-	-46.21	7.30		-		-46.21	-	-52.62
	BH2A		-				-				-				-				-			-	
	BH3		-			-14.20	-	-40.20	26.00		-			-40.20	-	-42.33	2.13		-		-42.33	-	-47.73
	BH4		-			-13.65	-	-42.55	28.90		-			-42.55	-	-43.30	0.75		-		-43.30	-	-49.25
	BH5		-			-13.26	-	-39.96	26.70		-			-39.96	-	-40.86	0.90		-		-40.86	-	-47.08
	BH6	-14.63	-	-43.73	29.10		-			-43.73	-	-48.42	4.69		-			-48.42	-	-56.18		-	
31769	BH1		-			-13.22	-	-48.64	35.42		-				-				-		-48.64	-	-54.01
	BH3		-			-13.90	-	-42.55	28.65		-			-42.55	-	-43.05	0.50		-		-43.05	-	-48.53
	BH4		-			-15.08	-	-36.98	21.90		-			-36.98	-	-38.83	1.85		-		-38.83	-	-44.02
	BH6		-			-15.77	-	-39.72	23.95		-			-39.72	-	-40.92	1.20		-		-40.92	-	-48.30
	BH8		-			-14.44	-	-38.84	24.40		-				-				-		-38.84	-	-44.14
	BH9		-			-15.59	-	-41.06	25.47		-				-				-		-41.06	-	-46.23
	BH10		-			-12.96	-	-30.81	17.85		-				-				-		-30.81	-	-36.06
	BH11		-			-12.97	-	-30.55	17.58		-			-30.55	-	-33.22	2.67		-		-33.22	-	-38.80
	BH12		-			-16.09	-	-42.49	26.40		-				-				-		-42.49	-	-47.99
	BH13		-			-14.45	-	-43.56	29.11		-				-				-		-43.56	-	-48.94
	BH15		-			-15.51	-	-33.51	18.00		-			-33.51	-	-36.11	2.60		-		-36.11	-	-43.21
	BH16		-			-14.21	-	-32.11	17.90		-			-32.11	-	-34.44	2.33		-		-34.44	-	-39.96
	BH18		-			-14.54	-	-33.15	18.61		-				-				-		-33.15	-	-39.35
17212	BH1	-14.22	-	-49.22	35.00		-				-				-			-49.22	-	-54.29		-	
	BH2	-13.86	-	-47.32	33.46		-				-				-			-47.32	-	-54.33		-	
	BH3A	-11.73	-	-47.73	36.00		-				-				-			-47.73	-	-52.85		-	
	BH3		-			-15.31	-	-36.51	21.20										-		-36.51	-	-44.01
Site Specific	DH01					-14.43	-	-38.43	24.00					-38.43	-	-42.18	3.75				-42.18	-	-47.32
	DH02					-13.17	-	-42.18	29.01					-42.18	-	-42.25	0.07				-42.25	-	-48.29
	DH03					-14.35	-	-46.23	31.88					-46.23	-	-47.76	1.53				-47.76	-	-52.95
	DH04					-16.46	-	-35.16	18.70					-35.16	-	-35.38	0.22				-35.38	-	-41.82
	DH05					-14.17	-	-38.17	24.00					-38.17	-	-44.55	6.38				-44.55	-	-50.01
	DH06					-10.85	-	-43.57	32.72												-43.57	-	-48.98
	DH07	-12.97	-	-35.17	22.20					-35.17	-	-41.14	5.97					-41.14	-	-47.62			
	DH08					-18.67	-	-39.47	20.80					-39.47	-	-39.67	0.20				-39.67	-	-45.85
	DH09					-14.25	-	-57.30	43.05					-57.30	-	-57.80	0.50				-57.80	-	-62.86
	DH10					-13.81	-	-38.91	25.10					-38.91	-	-43.72	4.81				-43.72	-	-49.16

Notes

CDG	COMPLETELY DECOMPOSED GRANITE
CDV	COMPLETELY DECOMPOSED VOLCANICES
HDG	HIGHLY DECOMPOSED GRANIITE
HDV	hIGHLY DECOMPOSED VOLCANICES
MDG	MODERATELY DECOMPOSED GRANITE
MDV	MODERATELY DECOMPOSED VOLCANIC ROCK
ALL	ALLUVIUM
COLL	COLLUVIUM
MD	MARINE DEPOSIT
FILL	FILL

Agreement No. CE 50/2019 (DS)
Upgrading of Tai Po Sewage Treatment Works
Investigation

Summary of Site Specific Site Investigation Results
Groundwater Monitoring

Location	Report No.	Drllhole ID	Ground Level (mPD)	Standpipe / Piezometer Install depth (m below ground)	Groundwater Level (m below ground)		Groundwater Level (mPD)		Period of Monitoring		
					Highest	Lowest	Highest	Lowest			
Tai Po Sewage Treatment Works	5810	M1A	5.80	14.05	1.17	1.49	4.63	4.31	19-Apr-83	-	26-Apr-83
		M3A	5.63	11.80	2.48	3.12	3.15	2.51	26-Apr-83	-	3-May-83
		M8A	5.76	15.00	2.34	2.40	3.42	3.36	19-Apr-83	-	26-Apr-83
		M7A	6.04	16.85	3.02	3.38	3.02	2.66	19-Apr-83	-	26-Apr-83
	12898	BH53	6.09	12.30	3.30	3.57	2.79	2.52	13-Sep-89	-	9-Nov-89
		BH59	5.58	14.00	2.90	2.96	2.68	2.62	25-Aug-89	-	9-Nov-89
	63738	DH01	8.50	14.00	2.73	3.12	5.77	5.38	22-Jul-16	-	29-Jul-16
		DH02	8.53	15.00	2.33	2.52	6.20	6.01	16-Aug-16	-	23-Aug-16
		DH03A	8.24	15.50	2.35	3.07	5.89	5.17	4-Aug-16	-	11-Aug-16
	17182	1003	5.99	12.00	1.30	1.33	4.69	4.66	19-Sep-92	-	26-Sep-92
		1003	5.99	37.00	1.91	1.92	4.08	4.07	19-Sep-92	-	26-Sep-92