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**BILLION JOY DEVELOPMENT LTD.**

**PROJECT PROFILE FOR THE REUSE OF  
TREATED WASTEWATER FOR COOLING TOWER  
MAKE UP IN PLANNED FOOD FACTORY  
AT NO. 3 DAI SHUN STREET  
TAI PO INDUSTRIAL ESTATE**

**REF. NO. 3.16/065/2012**

**REV. 0**

**SEPTEMBER 2013**

## 1. BASIC INFORMATION

### Project Title

- 1.1 Reuse of treated wastewater for cooling tower water make-up in food factory of Billion Joy Development Ltd. at No. 3 Dai Shun Street, Tai Po Industrial Estate, N.T..

### Purpose and Nature of the Project

- 1.2 Billion Joy Development Ltd. ["BJDL"] is planning to commission a food factory in Tai Po Industrial Estate. Food preparation, cooking and washing of cooking equipment will consume large quantity of water and produce wastewater requiring discharge. The food factory will thus be equipped with a wastewater treatment plant ["WWTP"] for treating wastewater from the food processing. Besides compliance with the discharge limits laid down by the Government Environmental Protection Department ["EPD"], the WWTP will be designed to allow bleeding off of 50m<sup>3</sup>/day of treated effluent with superior quality (as would be discussed in paragraph 4.11 and 4.12) for reuse as cooling tower make-up water after further disinfection treatment. This will thus produce significant savings in town water consumption with associated reduction in carbon emissions in the food factory operations. This will also allow BJDL to become a leader in environmental food processing.
- 1.3 The water reuse project ["WRP"] will thus cover the electrical and mechanical connection to the WWTP of a water retention tank of about 2m<sup>3</sup> capacity complete with ultra-violet ["UV"] disinfection facility and two transfer pumps of 5m<sup>3</sup>/h size for transferring disinfected treated water to cooling tower system of the food factory. The disinfected treated water will form part of the make-up water, which is typically town water to the cooling tower system. This will undoubtedly provide a practicable example in environmental protection to the catering industry vital to Hong Kong economy and tourism.

### Name of Project Proponent

- 1.4 Billion Joy Development Ltd. ["BJDL"]

### Location and Scale of Project

- 1.5 The planned food factory is located at No. 3 Dai Shun Street, Tai Po Industrial Estate, N.T. (Figure 1.1) and is aimed for commercial operation in mid.-2014. The food factory will be equipped with a WWTP not for mere compliance with discharge limits laid down by EPD, but also for demonstrating cost-effectiveness in contributing to environmental protection. The WWTP is to be designed for a daily water consumption of 400 m<sup>3</sup>/day employing advanced dissolved air flotation ["DAF"] and membrane bioreactor ["MBR"] technology. Besides compliance with the EPD discharge limits, the WWTP will be able to deliver 50m<sup>3</sup>/day of effluent treated to the quality suitable for water reuse (as per paragraph 4.13).
- 1.6 Figure 1.2 gives the schematic plan on the WWTP employing advanced dissolved air flotation ["DAF"] and membrane bioreactor ["MBR"] technology bleeds off treated effluent for further disinfection and subsequent use as cooling tower make-up water.
- 1.7 The WRP will comprise of the following components

- (a) A treated wastewater transfer tank typically of about 2<sup>3</sup> receiving treated wastewater from the WWTP equipped with ultra-violet ["UV"] disinfection facility
  - (b) Two transfer pumps each of 5m<sup>3</sup>/h capacity, with one on duty and on standby to transfer the further treated water to the air-conditioning cooling tower system
- 1.8 The entire footprint of the WRP will be of about 5m<sup>2</sup>. The construction and installation of the WRP will involve only electrical and mechanical services connection without any excavation and piling.

#### **Number and Type of Designated Project Covered by the Project Profile**

- 1.9 The project involves the construction and operation for reuse of treated wastewater from a food processing WWTP and is therefore classified as a Designated Project ["DP"] under Schedule 2 Part I – Category F.4 of the Environmental Impact Assessment Ordinance ["EIAO"] Cap. 499. An Environmental Permit ["EP"] is required for the construction and operation of the Project.
- 1.10 This Project Profile is prepared for application for approval to apply directly for an EP for the Project under Section 5(11) of the EIAO. It describes the scope of the project, assesses the potential environmental impacts associated with the Project and recommends mitigation measures to minimize the potential environmental impacts. It provides demonstration that the potential environmental impacts of the Project and the mitigation measures described in this Project Profile meet the requirements of the Technical Memorandum of the EIAO.

#### **Name and Telephone Number of Contact Person(s)**

- 1.11 The contact person for this Project is Mr S F Wat, Billion Joy Development Ltd, Room 203, 2/F Harbour Centre, Tower 1, 1 Hok Cheung Street, Hung Hom, Kowloon. His contact telephone number is 2332 5912.

## **2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **Implementation and Planning of the Proposed Project**

- 2.1 David S.K. AU & Associates Ltd. will carry out preliminary design for the WRP with specialist support from N&T and guidance from BJD. Most equipment to be used for the treatment plant will be pre-fabricated at factory for assembly installation on site. Construction activities would only cover electrical and mechanical services connection to the WWTP and make-up water tank of the cooling tower system. No excavation and underground utility laying. The construction works will be planned and executed in the best practicable environmentally friendly manner.

### **Tentative Project Timetable**

- 2.2 The factory is planned to commission by July 2014. As far as the WRP is concerned, the key target dates for the Project are:
- (a) Finalization of design requirements by October 2013
  - (b) Contract award by August 2013
  - (c) Commencement of construction the WRP on April 2014 (construction duration 1 week)
  - (d) Testing and commissioning of treatment plant completed by November 2014

### **Interactions with Other Projects**

- 2.3 It is not anticipated that the Project would have any major interaction with other projects in the surrounding area during its implementation period.

### **3. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT**

- 3.1 The whole WRP will be built and operated inside a food factory located in the Tai Po Industrial Estate specifically for industries of its kind. Road access to the site is very convenient.
- 3.2 It is about 400m from the Hong Kong & China Gas Co., Gas Production Plant in Tai Po Area 26, which is a potentially hazardous installation. However, there would be practically no change of population in the area during construction and operation phase and the limited electrical and mechanical services works will not be of hazardous concern.
- 3.3 During the construction and operation phase of the Project, air sensitive receivers ["ASR"] would be found at the buildings within food factory of BJD. There are no noise sensitive receivers identified within 300m of the proposed treatment plant.
- 3.4 All the sewages and wastewater discharges from the food factory are connected to foul sewer of the Tai Po Industrial Estate. As far as the WRP concerned, there are no water sensitive receivers will be relevant to the project during the construction and operation phase.
- 3.5 No water and ecological sensitive receivers are identified within the Project site.

#### 4. **POSSIBLE IMPACT ON THE ENVIRONMENT.**

##### **Construction Phase**

###### Air Quality Impact

- 4.1 Given the small scale of electrical and mechanical works involving the installation of one small water tank and two transfer pumps, no practicable air quality impact would be expected.
- 4.2 Good site practices are recommended in Section 5 to further minimize the impact.

###### Noise Impact

- 4.3 Construction noise would be generated mainly from the electrical and mechanical works for pipeline connection and installation of transfer pumps in the fully enclosed compartment of the factory. Due to the limited scale of construction works and the absence of noise sensitive receivers ["NSR"], adverse construction noise impact would not be anticipated.

###### Water Quality

- 4.4 No wastewater will be generated from the installation of the retention tank and transfer pumps of the WRP hence no water quality impacts of the Project would be associated with wastewater and sewage generated from construction works.

###### Solid Wastes

- 4.5 There will be negligible amount of solid wastes produced from the installation work of the WRP.

###### Ecology

- 4.6 No habitat with ecological values was identified within the site for the project. No tree removal activities and adverse ecological impact are anticipated under this project.

##### **Operational Phase**

###### Air Quality

- 4.7 The WRP will be operated in enclosed factory building consuming only electricity with no fuel combustion exhaust gases. There will be no gaseous air pollutants and fugitive dust particulate emissions during its operations.

###### Noise

- 4.8 The WRP would be accommodated in fully enclosed compartment and in the absence of NSR, there will be no noise impact anticipated during operation phase.

###### Water Quality & Natural Resources

- 4.9 The WRP will allow treated wastewater from the WWTP to be reused for cooling tower water make-up. It will thus reduce the consumption of fresh town water.

- 4.10 The treated wastewater from the WWTP complies with the licensed standards for effluent discharge under the WPCO will be directed to the treated wastewater transfer tank of the WRP equipped with UV disinfection facility. This will ensure water quality in the transfer tank will be acceptable for reuse as cooling tower water make-up. No change in quantity and quality in wastewater discharge from the food factory would result from the normal operation of WRP.
- 4.11 There are no specific water quality standards for make-up water reuse in cooling towers in Hong Kong. The standards are generally related to protection of public health and environment as a whole. Reference can thus be made to the USEPA Guidelines for Water Reuse (2012).
- 4.12 From Table 4-4 of the Guidelines for Water Reuse, criteria for industrial reuse can be found for pH, biochemical oxygen demand ["BOD"], suspended solids and coliform. The most stringent criteria among the various states in the US will be as follows:
- pH: 6.0 - 9.0  
BOD: 30mg/L  
Total suspended solids ["TSS"]: 30mg/L  
Fecal Coli: 200/100 mL
- 4.13 As the influent to the WRP is not of fecal in nature and employing the common parameters in local wastewater analysis, it is proposed to adopt the following water quality standard in the present WRP:
- pH: 6.0 - 9.0  
BOD: 30mg/L  
TSS: 30mg/L  
E Coli: 200/100 mL
- 4.14 Adoption of the above proposed water quality criteria for the WRP can thus protect the health of the factory staff. There will also be no public exposure to the reusing water.
- 4.15 There will not be emergency overflow and/or incompliance scenario as any excess water not required for cooling tower make-up and/or tested incompliance, the water will simply be bypassed and discharged in accordance to the licence for discharge requirements under Water Pollution Control Ordinance to foul sewer of the Tai Po Industrial Estate.

#### Solid Wastes

- 4.16 There will practically be no solid wastes produced during normal operation of WRP. There may be minimum sludge generated in the maintenance cleaning of the treated water transfer tank.

#### Ecology

- 4.17 No ecological impact would be expected during the operation phase of the project as the plant is located in industrial estate with no ecological values.

#### Landscape and Visual Impacts

- 4.18 The small size of the retention tank and transfer pumps of the WRP housed within enclosed building of the food factory will pose no landscape and visual issues.

#### Hazard to Life

- 4.19 No chemicals will be used and due to the small scale of electrical and mechanical services work in the WRP, no hazard to life is anticipated during normal operation.



## **5. ENVIRONMENTAL PROTECTION MEASURES**

### **Construction Phase Control Measures**

#### Air Quality

- 5.1 As discussed in Section 4, air quality impact due to project construction will be anticipated.

#### Noise

- 5.2 There will be no adverse noise impacts during the construction phase from the WRP.

#### Water Quality

- 5.3 There will be negligible amount of wastewater generated from the construction of WRP.

#### Construction Waste Management

- 5.4 There will be negligible amount of solid wastes produced from the construction of WRP.

#### Ecology

- 5.5 No adverse ecological impact is identified in construction phase of the WRP and no mitigation measure is required. No tree removal is involved in the project.

### **Operation Phase Control Measures**

#### Air Quality

- 5.6 No mitigation measure would be required during operation.

#### Noise

- 5.7 No mitigation measure would be required during operation.

#### Natural Resource and Water Quality

- 5.8 No adverse water quality impact would be anticipated from the project. In fact, the project brings advantages in reducing the amount of wastewater discharged into the environment and reducing fresh water demand.

- 5.9 A program should be set up for regular monitoring of the WRP transfer tank water quality to ensure compliance with the quality standards given in paragraph 4.13. Should exceedance of the water quality standards be found, the transfer pumps should be stopped to transfer treated water to the air-conditioning cooling towers and re. Its proposed that the water sampling at the transfer pump discharge be carried out monthly and analysis for pH, BOD, TSS and E Coli in a HOKLAS accredited laboratory.

- 5.10 In order to further minimize possible human contact with the treated water, a signage of "Recycled Water" should also be provided.

### Wastes

- 5.11 Negligible sludge generated from the maintenance of the WRP will follow the current general practice of mechanically dewatered at individual treatment works and be taken to landfills for final disposal.

### Ecology

- 5.12 No adverse ecological impact is identified during operation phase and no mitigation measure is thus required.

### Hazard to life

- 5.13 No hazard impact was identified during operation phase and no mitigation measure is required.

### Duration of Environmental Effects

- 5.14 The duration of the key construction of the project is expected to be completed in a month. No residual impacts on air quality, noise, water quality, waste and ecology would be predicted during construction phase with the implementation of mitigation measures described above in view of the small scale of construction work.

### Comment on Further Implications

- 5.15 During operation phase, no unacceptable environmental impacts are identified, including air quality, noise, water quality, waste, ecology and hazard to life.

### **Use of Previously Approved EIA Reports**

- 5.16 None

## 6. CONCLUSIONS

- 6.1 The potential environmental impacts and the proposed mitigation measures to be incorporated into the design and construction contract of the proposed WRP are summarised in Table 6.1.

**Table 6.1 Summary of Potential Environmental Impacts and Mitigation Measures**

<b>Project Stage</b>	<b>Potential Environmental Impact</b>	<b>Mitigation Measures</b>
Construction	Minor dust nuisance	Control by contract specifications
	Noise impact	No adverse impact is identified; no mitigation measure is required
	Water Quality	No adverse impact is identified; no mitigation measure is required
	Solid waste impact	No adverse impact is identified; no mitigation measure is required
	Ecological impact	No adverse impact is identified; no mitigation measure is required
Operation	Air Quality	No adverse impact is identified; no mitigation measure is required
	Noise impact	No adverse noise impact is identified, mitigation measure is not required.
	Impact on water quality & natural resources	Beneficial impact in reducing water consumption. Monthly water quality monitoring program for discharge the WRP transfer pumps to ensure that the designed water quality standards are met and to stop reuse of the water should compliance with the standards is not achieved.
	Ecological impact	No adverse impact is identified; no mitigation measure is required.
	Solid Waste impact	No adverse impact is identified
	Hazard impact	No adverse impact is identified; no mitigation measure is required.

- 6.2 To conclude, wastewater recycling has advantage of providing beneficial uses of the treated effluent, reducing wastewater discharge into the environment and reducing the consumption of fresh water.

## LIST OF FIGURES

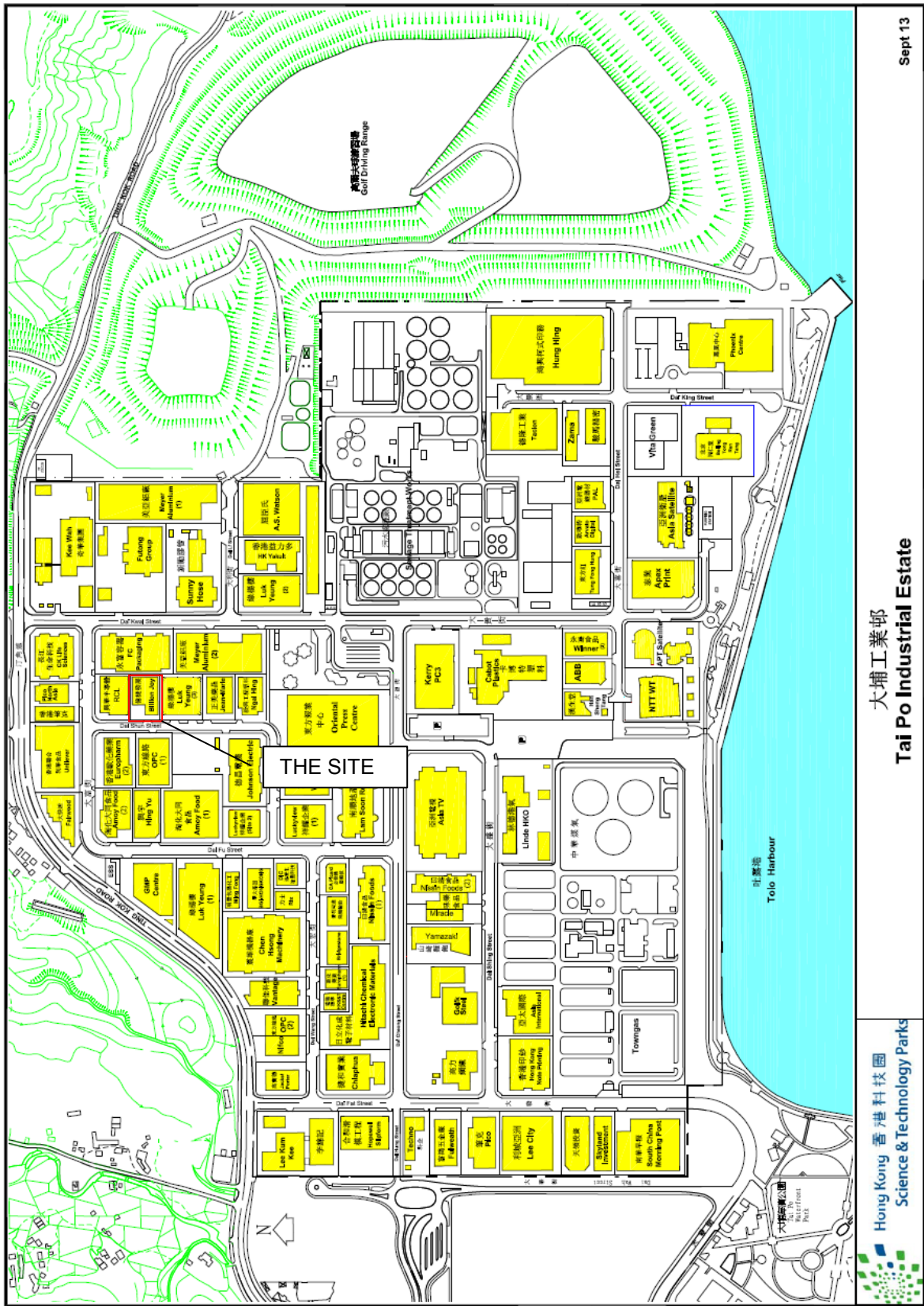


Figure 1.1 The Site Plan

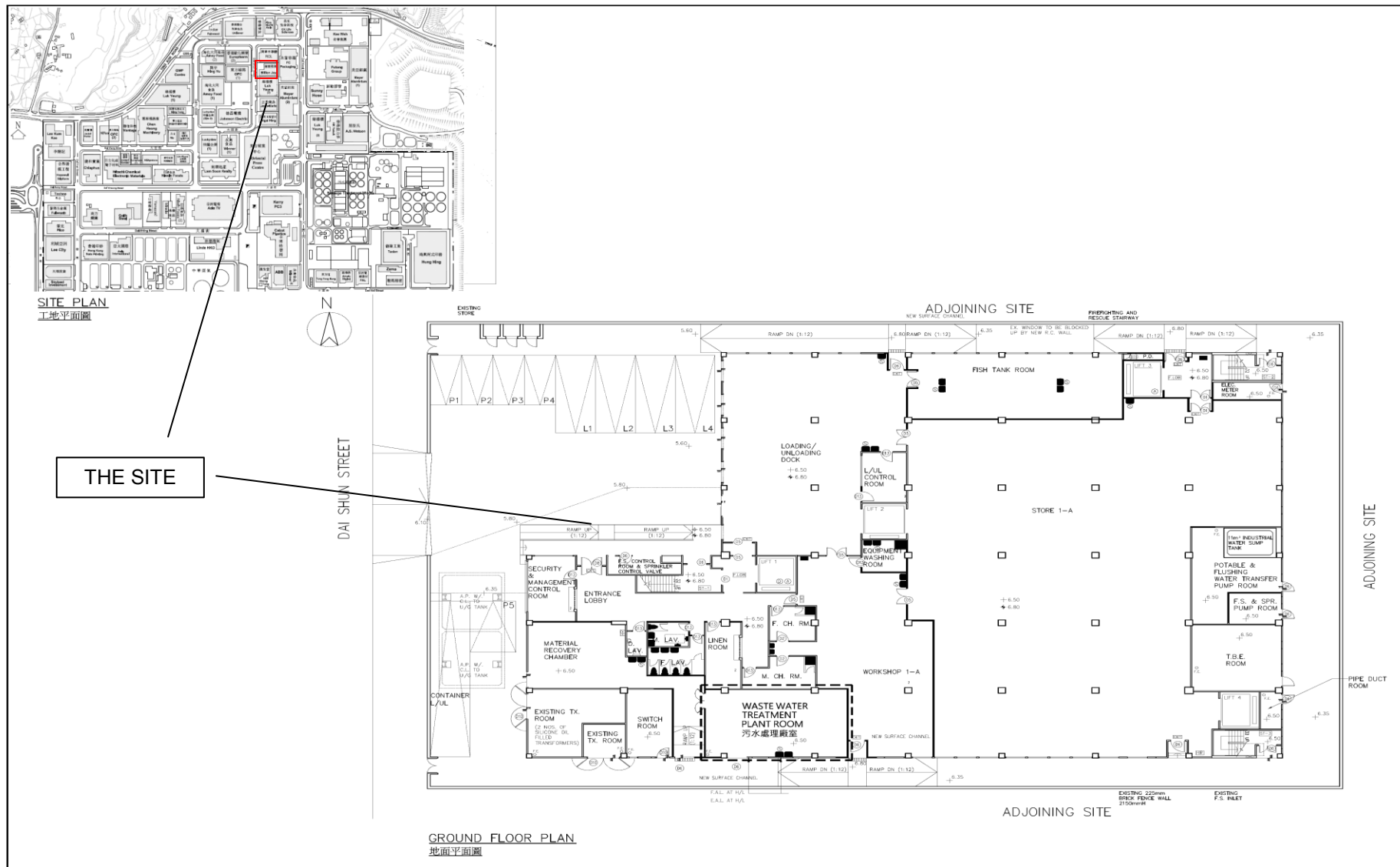


Figure 1.2 The Project Site

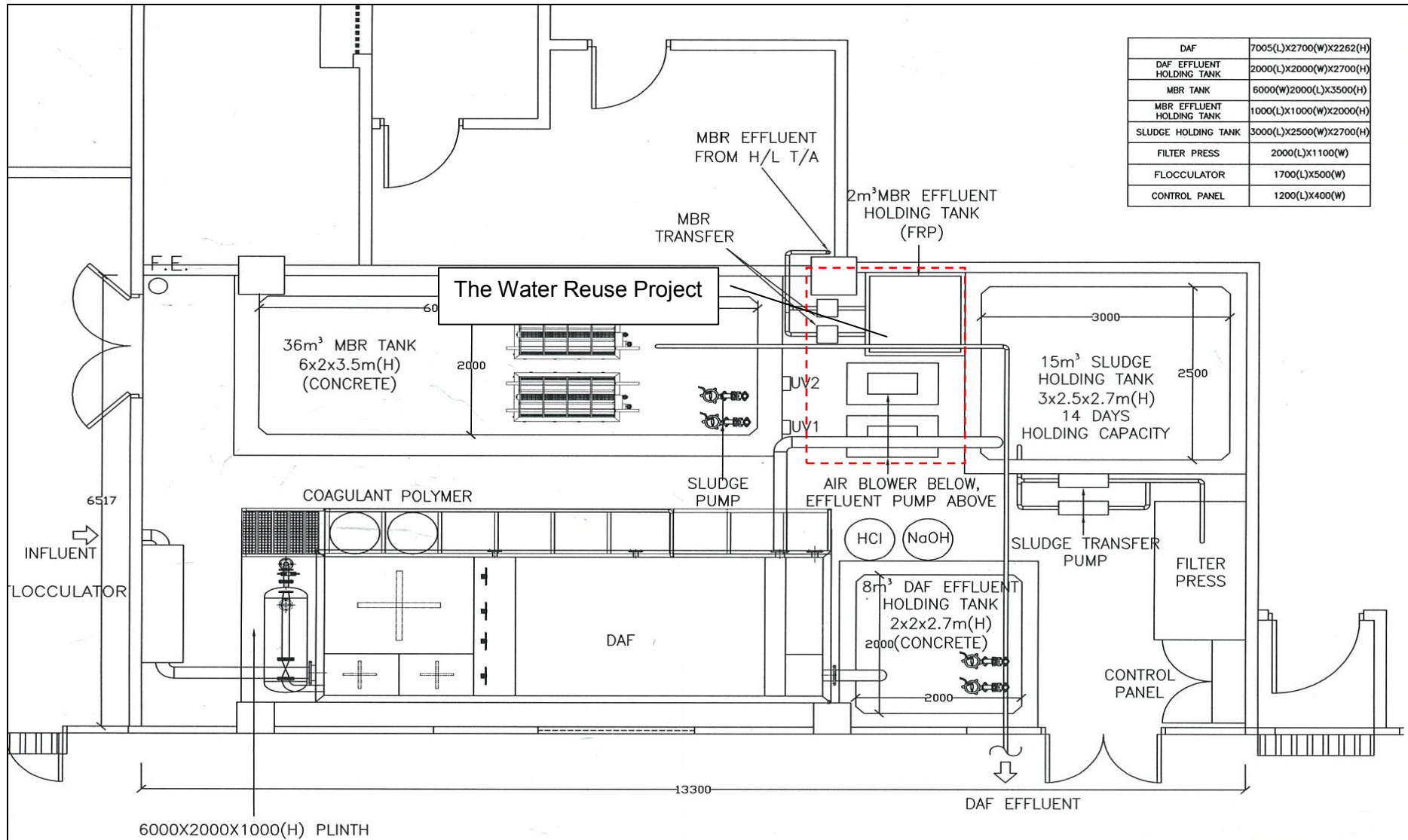


Figure 1.3 The Water Reuse Project

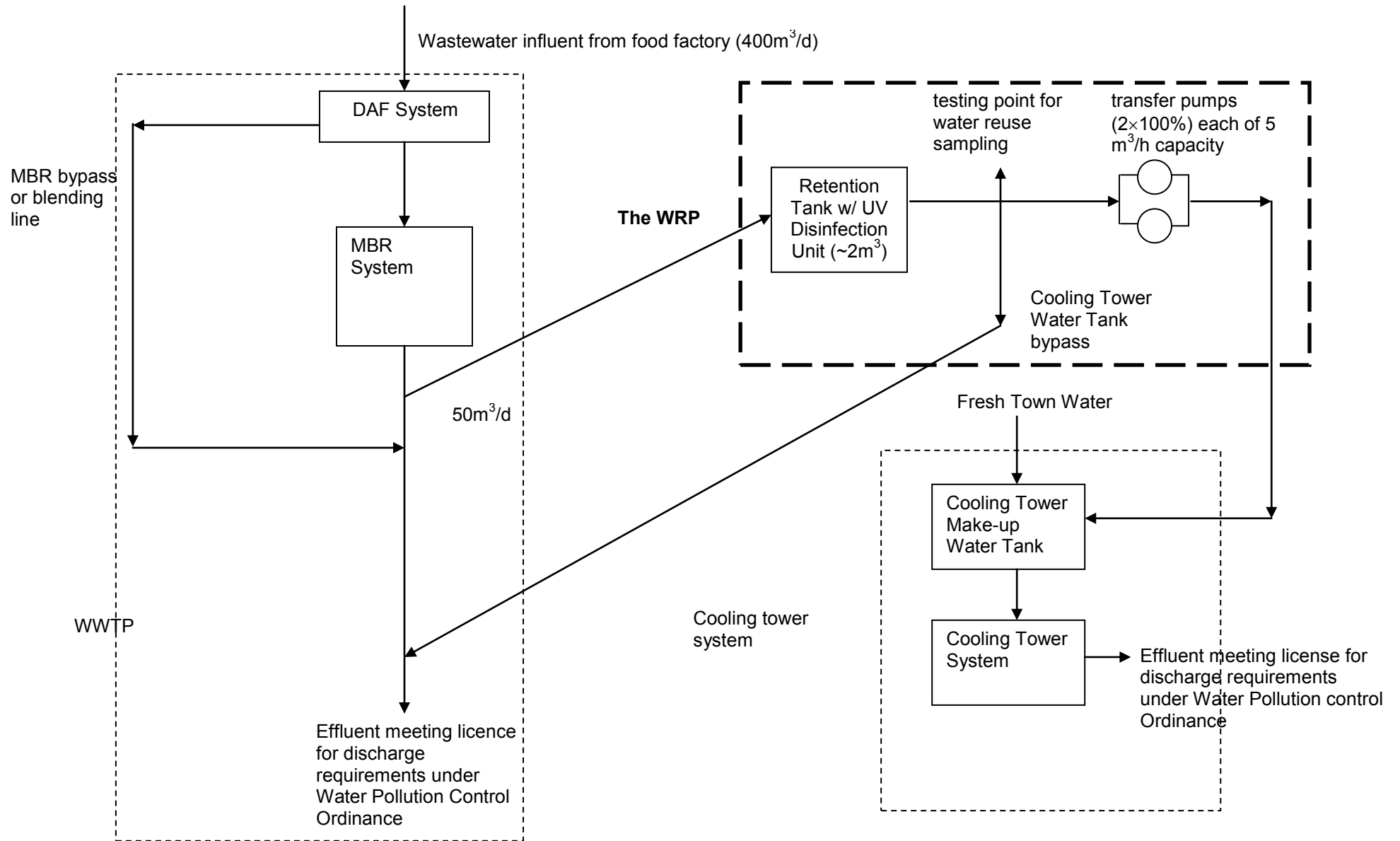


Figure 1.4 Schematic of the WWTP System and Water Reuse Project