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Timothy Wai Pui WU/PLAND

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類別: Internet Email

Dear Sir,

Please see attached response to the comments of the DEP. Thank you.

Best Regards,

Patrick Tsui

Mobile: [redacted]

Total: 20 pages

Date: 16 September 2025

TPB Ref.: A/NE-TKLN/99

By Email

Town Planning Board
15/F, North Point Government Offices
333, Java Road
North Point
Hong Kong
(Attn: The Secretary)

Dear Sir,

Proposed Temporary Battery Recycling Plant and Associated Filling of Land for a Period of 3 Years at Lot 215 RP (Part) in D.D.78, Ta Kwu Ling, N.T.

Our response to the comments of the Director of Environmental Protection (DEP) is found in the attachment. The applicant also confirms that there is no residents near the application site.

Should you have any enquiries, please feel free to contact our Mr. Patrick Tsui at [redacted] at your convenience.

Yours faithfully,

Patrick Tsui

c.c. Sha Tin, Tai Po and North District Planning Office (Attn: Mr. Timothy WU) – By Email

Reply to the questions

Question 1

(a) On air, to enable a comprehensive assessment of air quality implications, the applicant shall provide the following details pertaining to the associated carbonization furnaces and chimney. The submission of this information is particularly important in the absence of a quantitative air quality impact assessment at this stage. Depending on the information received, such an assessment may subsequently be required:

Operational Specifications- please furnish details operational parameters including the installed capacity, processing capacity(in kg/hour),hourly fuel consumption rates for both the carbonization furnaces and chimney, and the exact height.

Environmental improvement- please advise the operation details (e.g. type of batteries being processed, treatment process, capacity, processing capacity of the carbonization furnaces and height of chimney) of the existing battery recycling plant at Hung Shui Kiu and specify if there any operational or environmental improvements compared to the previous setup.

SP License- The applicant shall clarify whether the installation and operation of carbonization furnaces and chimney will involve and specified processes controlled under Air Pollution Control (specified processed) Regulations, which would require a Specified Process (SP) License, or require prior approval under Air Pollution Control (Furnaces, Oven &Chimneys) (Installation & Alteration) Regulations. The applicant shall demonstrate the chimney would not result in adverse air quality impact to the domestic premises nearby with reference to the HKPSG buffer distance requirements.

Answer:

Operational Specifications

The carbonization furnace adopts the external heating type and pyrolysis technology under completely oxygen-free conditions, which can achieve energy conservation and resource recycling.

Figure 1 The Photo of Battery Carbonization Furnace

The size of the carbonization furnace is as below

Standard	pyrolysis box capacity	material capacity(daily)	Overall dimensions （L*B*H）	fuel consumption rates
CYT-3500	3.4m^3	2 m^3 or2000kg	3.9m x 2.1m x 2.7m	50-60Ldiesel/daily

Parameters of chimney

material	Size(diameter)	height
Stainless steel with insulation cotton	440mm	15m (3 meters above the building)

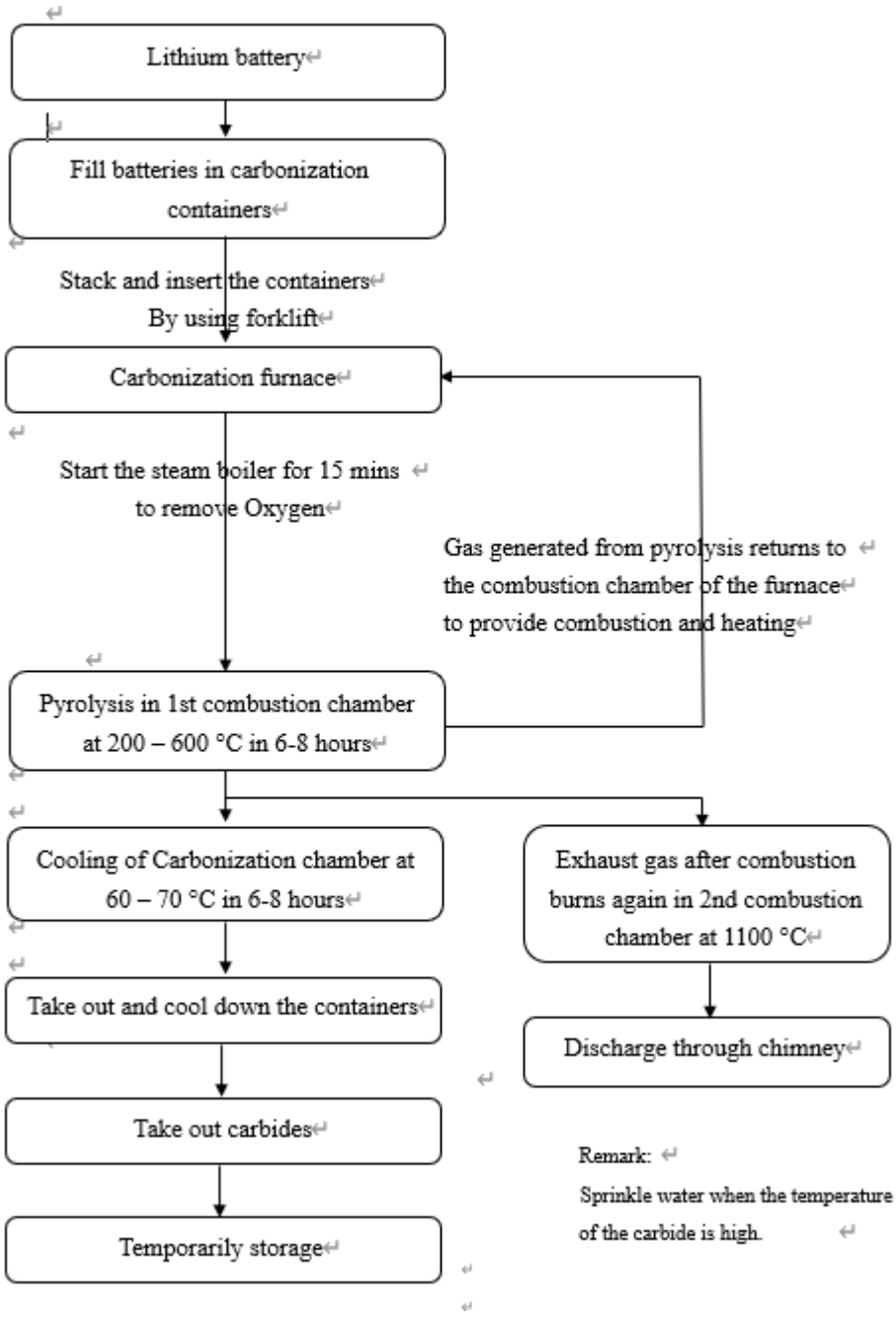
According to the plan, four carbonization furnaces have been reserved in the proposed battery recycling plant. Each carbonization furnace has a maximum capacity of 2 tons, and processing lasts for 8-10 hours (operating once a day). The fuel supplies about 2 hours and consumes approximately 25-30 liters of diesel per hour. Therefore, the maximum processing capacity of the factory is 8 tons per day, and the fuel consumption is 100-120 liters per day. Carbonization furnaces are mainly used for the pyrolysis treatment of vehicle lithium batteries, where the electrolyte in the batteries is decomposed under an oxygen-free condition. The chimney's main function is to discharge the vehicle battery pyrolysis gas that has been subjected to high-temperature incineration and purified by environmental protection facilities.

Environmental improvement

Now we have a carbonization furnace (CYT-3500) with a processing capacity of 2 tons per day in our plant.

The carbonization furnace is mainly used for processing vehicle batteries and other lithium batteries (e.g. mobile phone batteries and notebook batteries).

Pyrolysis Procedure



The working principle of the carbonization furnace is as below:

After loading the lithium batteries into the pyrolysis box of the carbonization furnace, the steam boiler is started for 15 minutes to remove the oxygen in the pyrolysis box. Then, the heating program of the carbonization furnace is activated to heat the pyrolysis box to 200 – 600 ℃ (set the pyrolysis temperature according to the filling material). The gases generated from the pyrolysis of the lithium batteries would be introduced into the combustion chamber of the carbonization furnace for combustion and heating of the pyrolysis box for 6 to 8 hours continuously. The exhaust gas after combustion will be burned again in a secondary combustion chamber at 1100 ℃, then it is processed through a filtration purification device to remove air pollutants from the pyrolysis processes, and finally discharged through the chimney. The solid products obtained after the battery pyrolysis will be cooled and sent to the crushing area for further crushing processes.

a. Time schedule
   (1) The operational process begins at 9:00 with the insertion of the batteries and the activation of the steam boiler.
   (2) At 9:20, the carbonization furnace is heated, initiating a two-hour thermal ramp-up. During this period, the temperature within the pyrolysis chamber is expected to reach 600 °C, at which point pyrolysis reactions commence, generating combustible gases.
   (3) From 11:20 to 17:20, the gases produced by the pyrolysis of the batteries are continuously utilized to sustain the heating of the system. Following this phase, the carbonization furnace enters a cooling stage from 17:30 until 06:00 the next day, lasting approximately 10 hours.
   (4) Finally, between 08:50 and 09:00 on the following morning, the carbonized battery residues are removed and transported to the crushing area for further processing and material recovery.

Air pollution Control Measures for the Pyrolysis Process for Waste Electric Vehicle (EV) batteries

The measures for controlling the air pollution from lithium batteries pyrolysis process include three parts: 1) The high-temperature incineration of the carbonization furnace, 2) the exhaust gas purification filtration system, and 3) measures for controlling exhaust gas from the chimney. The exhaust gas is colorless and odorless, and has been professionally tested and found to meet the environmental standards of Hong Kong.

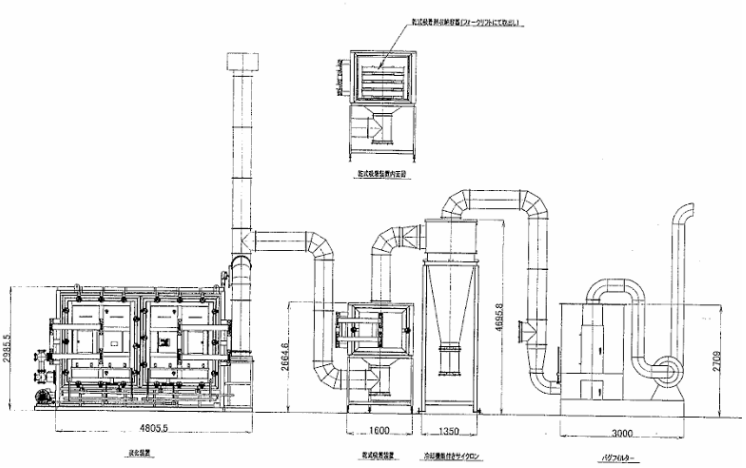


Figure 2 The Control Measures for batteries pyrolysis Process

(For illustration only: actual layout may differ depending on site conditions.)

(i) <u>The high-temperature incineration of the carbonization furnace</u>

First of all, an appropriate incineration temperature is not only beneficial for the decomposition and destruction of organic toxic substances but also helps prevent the generation of black smoke. According to the experimental parameters, the incineration temperature range for most organic substances is between 800 and 1100 °C, usually around 800 to 900 °C.

- A combustion temperature ranging from 800 to 950 °C has a perfect effect on deodorizing exhaust gases,
- A combustion temperature of 900 to 1000 °C can prevent the generation of black smoke,
- Chlorine can be converted into hydrogen chloride and easier to be decomposed when the incineration temperature is above 800-850 °C;
- The cyanide can be almost completely decomposed when the incineration temperature reaches 850 - 900 °C.
- High-temperature incineration is also the best method for removing PCDD and PCDF. The formed dioxins, if any, can be completely decomposed if keeping the temperatures of the combustion chamber and the secondary combustion chamber no lower than 850 °C, and the outlet temperature of the combustion chamber reaches 950 - 1050 °C.

The carbonization furnace itself has two combustion chambers. The combustion temperature will rise rapidly to between 900 and 1000 °C after the start, as shown in Figure 3E-2. From the test report of independent professional laboratory, it indicates that the measured dioxin concentration of exhaust gas is 0.011 ng-TEQ/Nm^3, which is below the emission limit set

by the authority (EPD).

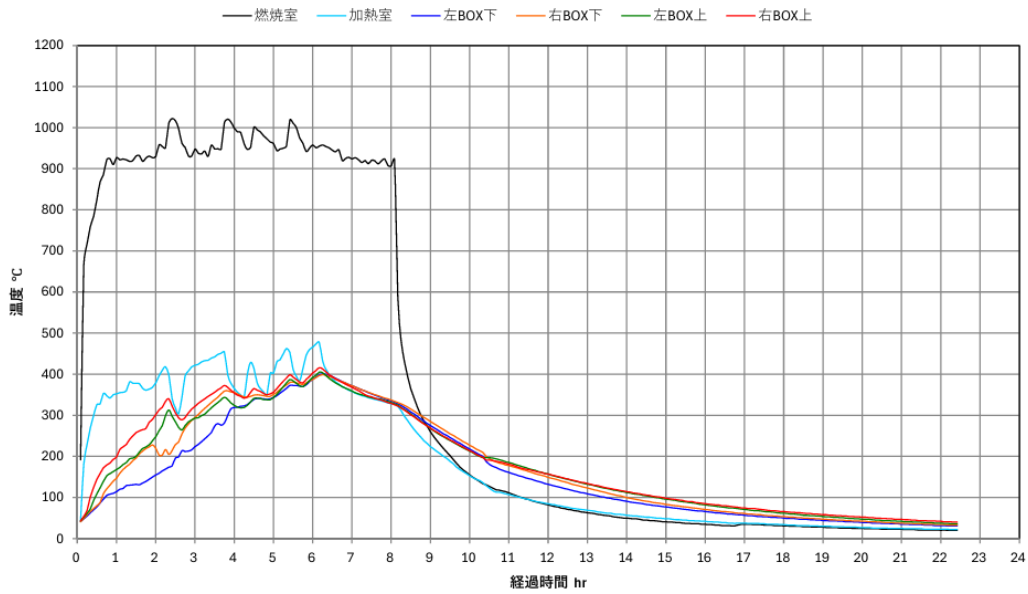


Figure 3 The temperature variation process of carbonization furnace

(ii) <u>The exhaust gas purification filtration system</u>

Following the carbonization furnace is a set of dry filtration and adsorption devices, including a cyclone dust collector, a lime filter box and a bag filter. The cyclone dust collector can remove large particles and heavy metals adsorbed on the particles, avoiding blockage of the lime adsorption box by particles. The gas flow rate and adsorption efficiency of the lime adsorption box will be reduced if blockage happens.

The lime adsorption box can remove acidic gases such as sulfur dioxide, hydrogen chloride, hydrogen fluoride and nitrogen dioxide from the exhaust gas by allowing the granular lime balls to contact the acidic gases and then undergo chemical reaction with these gases. As shown in the test report from an independent professional laboratory, the concentration of harmful gases in the exhaust gas has been significantly decreased after passing through the lime adsorption device.

The bag filter is composed of neatly arranged filter bags. The particle size it can remove is generally within the range of 0.05 μm - 20 μm, and its dust removal efficiency can reach over 99%. Besides, the bag filter also has excellent performance in removing heavy metals and trace organic compounds.

(iii) Measures for controlling exhaust gas from the chimney

These measures include sufficient discharge height of the chimney, maintaining minimum exhaust gas temperature and discharge velocity to the atmosphere as required by EPD. The height of the chimney is designed to be 18 meters, which is 3 meters higher than the tallest building around. This is conducive to rapid diffusion of the exhaust gas and avoids any impact on surrounding buildings. By adding insulation layers in the flu, the temperature loss of the gas is reduced before discharge to the atmosphere to meet the minimum discharge temperature of 80 ^{o}C as required by EPD. Finally, the rotational speed and operating power of the blower will be adjusted to achieve a final gas discharge velocity of over 7 m/s as required by EPD.

SP License

Vannex clarify the installation and operation of carbonization furnaces and chimney will involve and specified processes controlled under Air Pollution Control (specified processed) Regulations. And we have invited environmental consultants specializing in air pollution to conduct an environmental assessment and assist us in applying for the license of specified processes controlled under Air Pollution Control (specified processed) Regulations. Currently, we have purchased and completed the installation of the carbonization furnace and the chimney in our plant. And we are currently applying for the license of specified processes controlled under Air Pollution Control (specified processed) Regulations. It is expected to obtain the license by the end of 2025.

Moreover, as the contractor of the rechargeable battery recycling program of the EPD, we have maintained continuous communication with the EPD at all stages of factory location selection, carbonization furnace purchase, and pollution control. During the installation of the carbonization furnace, the personnel from the EPD also visited our factory to understand the progress.

Question 2

(b) On Noise, the applicant shall address if there is any noise impact arising from the proposed development (e.g. from crushing and sorting activities) and

traffic of heavy vehicles (including medium goods vehicle having a permitted gross vehicle weight exceeding 5.5 tonnes).

Answer:

Since the crusher and blower in the crushing and sorting process line generate noise during operation, we would take measures to control the noise and ensure that the noise within the plant area complies with environmental protection standards and does not have any impact on the surrounding environment.

the following measures will be taken to control the noise:

- Construct soundproof walls and install soundproof doors and windows between the crushing sorting area and other areas to reduce the impact of noise generated by equipment operation on other areas within the factory. And after the noise is blocked by the soundproof wall, the factory buildings and the surrounding fences, it will be reduced to a much lower level and will not have any impact on the surrounding environment.
- Noise monitoring devices would be installed in the crushing and sorting area. The noise intensity is continuously monitored during the operation of the equipment. In addition, periodic surveys and assessments of the impact of noise would be conducted, and then improvement measures would be proposed based on the surveys and assessment results.

The noise of heavy vehicles

Our vehicles are medium goods vehicles, During the transportation process, there will be some noise generated. However, our average traffic generation rate of our medium goods vehicles is extremely low (0.3 pcu/hr), which is generally not regarded as the Traffic causing significant noise pollution. And we will take measures to reduce the impact of the noise caused by the traffic of vehicles.

- The plant operates from 9 a.m. to 6 p.m. (Monday to Saturday). It does not operate at night or on Sundays. Therefore, there will be no transportation vehicles passing through and no noise during the night and on Sundays.

- We will choose vehicles with low noise levels and in good condition for transportation to reduce noise generation. The average traffic generation rate of our medium goods vehicles is 0.3 pcu/hr, which is extremely low and there will not be significant impacts raising on traffic noise .
- When driving on Lin Chuk Road, our medium goods vehicles would travel at a low speed in a steady manner, avoiding frequent starts and stops and rapid acceleration, thereby reducing noise emissions.

Question 3

(c) On water, the nearest watercourse is approximately 15m away from the project site boundary. The applicant shall address if there is any water quality impact to the water sensitive receivers during the construction and operation of the proposed development .

Answer:

The proposed plant has no impact on the watercourse, the reason is below.

- All the operations such as transportation, storage and processing in the plant are carried out indoors, eliminating the possibility of pollution from rainwater runoff caused by open-air stacking.
- We have asked the environmental consultant to prepare a drainage report for the proposed site. Peripheral 600mm U-channel will be constructed to collect the stormwater from the sites to the proposed catchpit and the desilting trap will be constructed in the last catchpit before discharge to the existing drainage system.
- The wastewater generated during the battery processing mainly consists of (i) the salt water used for soaking the batteries, (ii)approximately 25 liters/daily of condensed distilled water produced daily by the carbonization furnace, and(iii) 50 liters/daily of filtered tap water produced by the steam boiler.

  The salt water used for battery soaking is recycled and not discharged. The distilled water and filtered water have been tested by professional institutions and found to have good quality. They will be reused for flushing toilets and cleaning purposes within the factory or discharged into

the underground sewage pipes.

- Domestic sewage will be treated in the septic tank and then discharged into underground sewage pipes, thus not having any impact on the watercourse.
- Before the commencement of construction and operation, we will apply for a drainage permit. During the construction and operation periods, we will strictly abide by the laws and environmental protection requirements, and entrust professional institutions to conduct regular water quality tests.

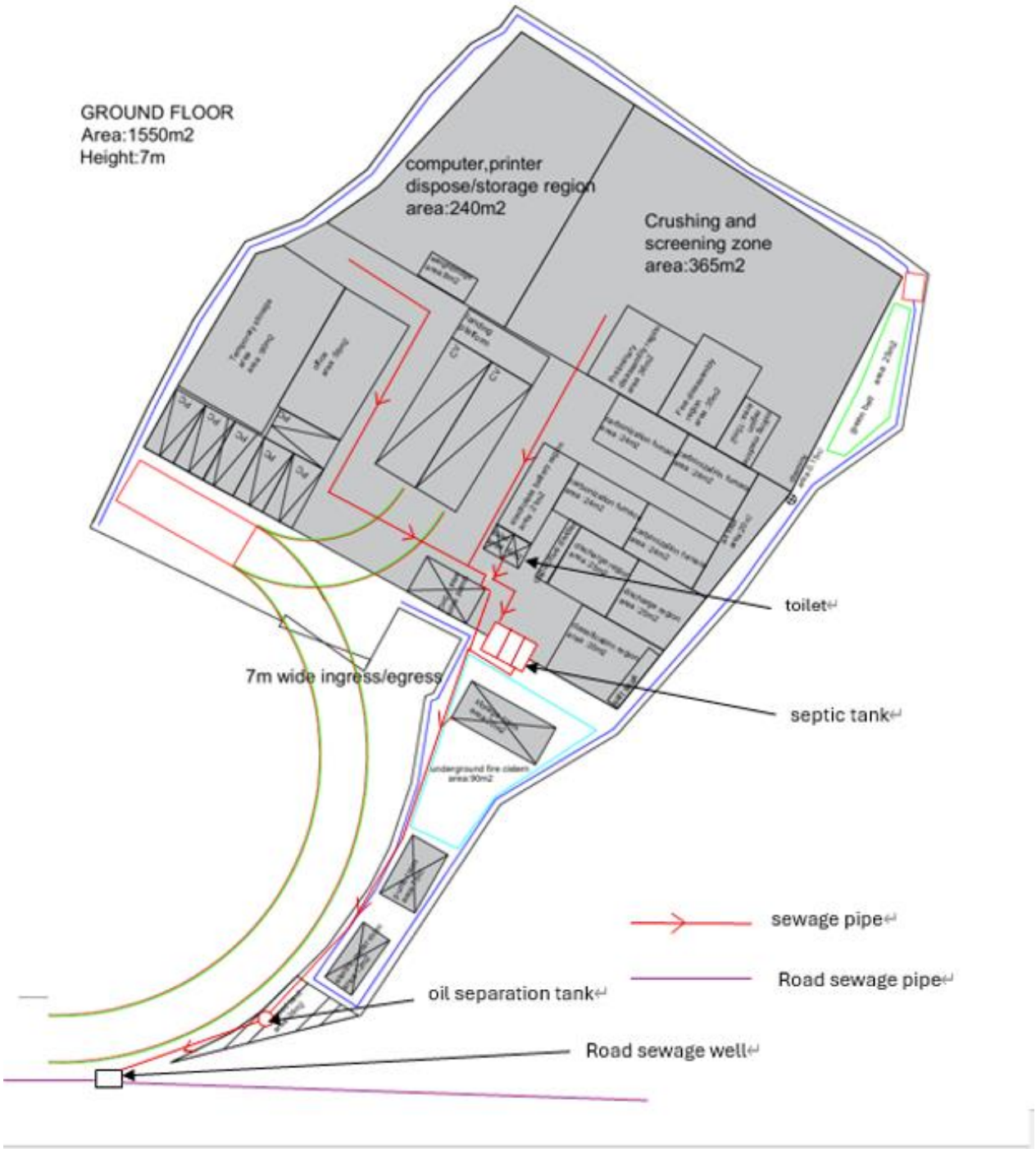
Question 4

(d) On Sewerage, the applicant shall advise the measures for sewage treatment and disposal (e.g. septic tank and soakaway system).

Answer:

On Sewerage, since the wastewater produced by the carbonization furnace and steam furnace is relatively clean and does not require separate treatment, it can be reused or discharged into the underground sewage pipes. Therefore, the proposed plant would construct a common sewage discharge system that includes an oil separator and septic tank.

The sewage from the toilets will first be treated in the septic tank for preliminary processing and then discharged into the sewage pipe. The clean drainage generated from carbonization furnaces and steam boiler will not pass through the septic tank but will be discharged to the outlet connection well after passing through the oil separator and then be discharged into the road sewage pipe.



(e) On waste, the applicant shall advise the measures for storage, collection and disposal of chemical waste. The applicant is reminded to obtain relevant licenses/permits(e.g. chemical waste collection licence, chemical waste disposal licence, registration as chemical waste producer, waste export permit, e-waste disposal licence) under waste disposal ordinance before the operation of the proposed facility.

Answer:

on waste, as the recycling contractor of EPD, VANNEX has been engaged in environmental recycling for 20 years. It holds complete licenses for the collection, storage and treatment of chemical and electronic waste. If necessary, we can provide the processing instructions for chemical waste from the existing plant. We will apply for the relevant licenses/permits from EPD before the operation of the proposed facility.

(f) on landfill gas, please specify that a separate Landfill Gas Hazard Assessment (LFGHA) Report has been submitted and include a brief summary of the LFGHA in the Planning Statement.

Answer:

On landfill gas, Aurecon Hong Kong Limited (Aurecon) was appointed by Vannex International Limited (Vannex) as the Environmental Consultant to undertake this landfill gas hazard assessment on Dem/2024. And the report has been submitted to the authorities.

The conclusion of the landfill gas hazard assessment is below:

(1) Given the Project site lies within the NENT Landfill 250m Consultation Zone, this landfill gas hazard assessment was undertaken to determine the overall level of landfill gas risk and categorized as “Medium”. Appropriate landfill gas protection measures and regular monitoring during both the construction and operation phases would be carried out.

(2) When the detailed design of the Project is available, Vannex would finalize the detailed and specific design of landfill gas protection measures for the approval by the EPD.

(3) Provided that all the recommended measures and monitoring were implemented properly, the safety of construction workers and all personnel present in the Project site would be safeguarded and adverse impact is unlikely anticipated.

3. please confirm if there is any fuel gas to be stored on-site e.g. LPG and seek EMSD's view from fuel gas risk perspective.

Answer:

There is not any fuel gas to be stored on-site. The carbonization furnace uses diesel fuel. The fuel is stored in a dedicated fuel tank according to daily consumption. Diesel is replenished before the operation starts every morning. Moreover, signs prohibiting open flames and smoking will be posted at the site, and gas monitoring instruments for flammable gases will be installed to ensure safety.

We have already consulted the mechanical and electrical departments regarding the use and storage of diesel fuel for the carbonization furnace in the existing factory. And after the approval of the construction of the proposed plant, we will consult the mechanical and electrical department about the use of diesel fuel for the carbonization furnace again.

4. It is noted that the proposed plant will be used mainly for waste batteries disposal and a small area on the G/F is reserved as a backup space for regulated electrical appliances disposal. Please advise the treatment process and capacity for regulated electrical appliances(e.g. computers, printers, scanner, monitors).

Answer:

The capacity for regulated electrical of vannex is as below, and the capacity of proposed plant will be same.

E-WASTE TYPE	MAXIMUM DAILY CAPACITY (tonne)	E-WASTE STORAGE ARRANGEMENTS

Monitor and Television	2.2	Trolley and Pallet
Computer (Notebook)	0.4	Trolley and Pallet
Computer (Tablet)	0.5	PP box
Printer	0.8	Trolley and Pallet
Scanner	0.2	Trolley and Pallet

The treatment process for regulated electrical :

Monitor and Television Recycling Process

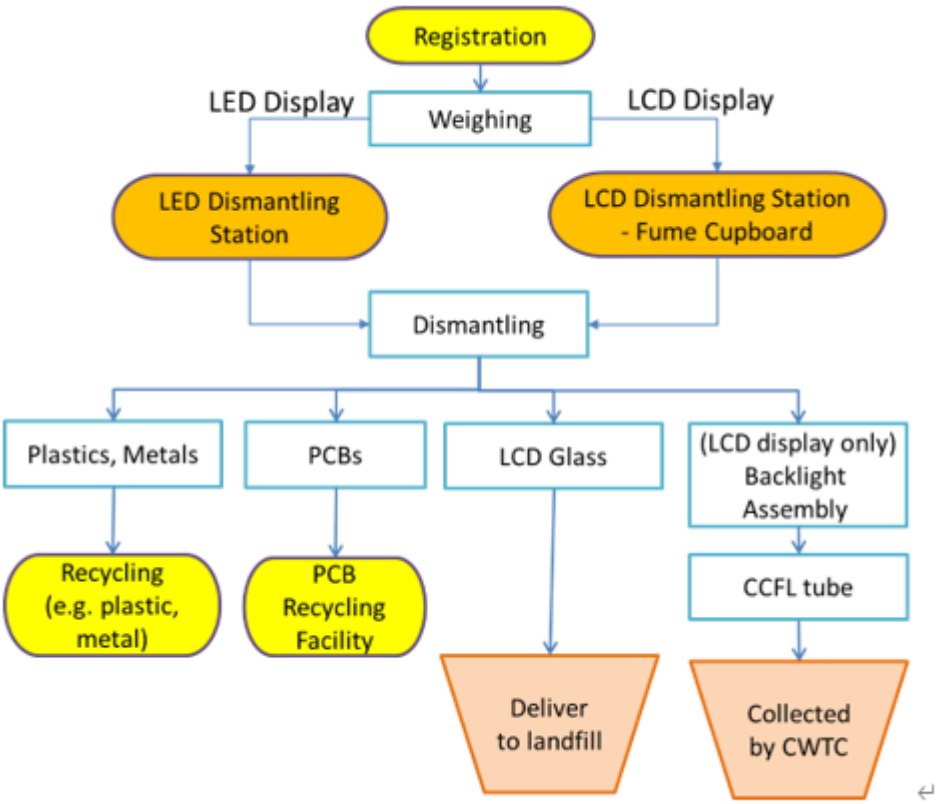


Figure 4D-5: Notebook Recycling Process

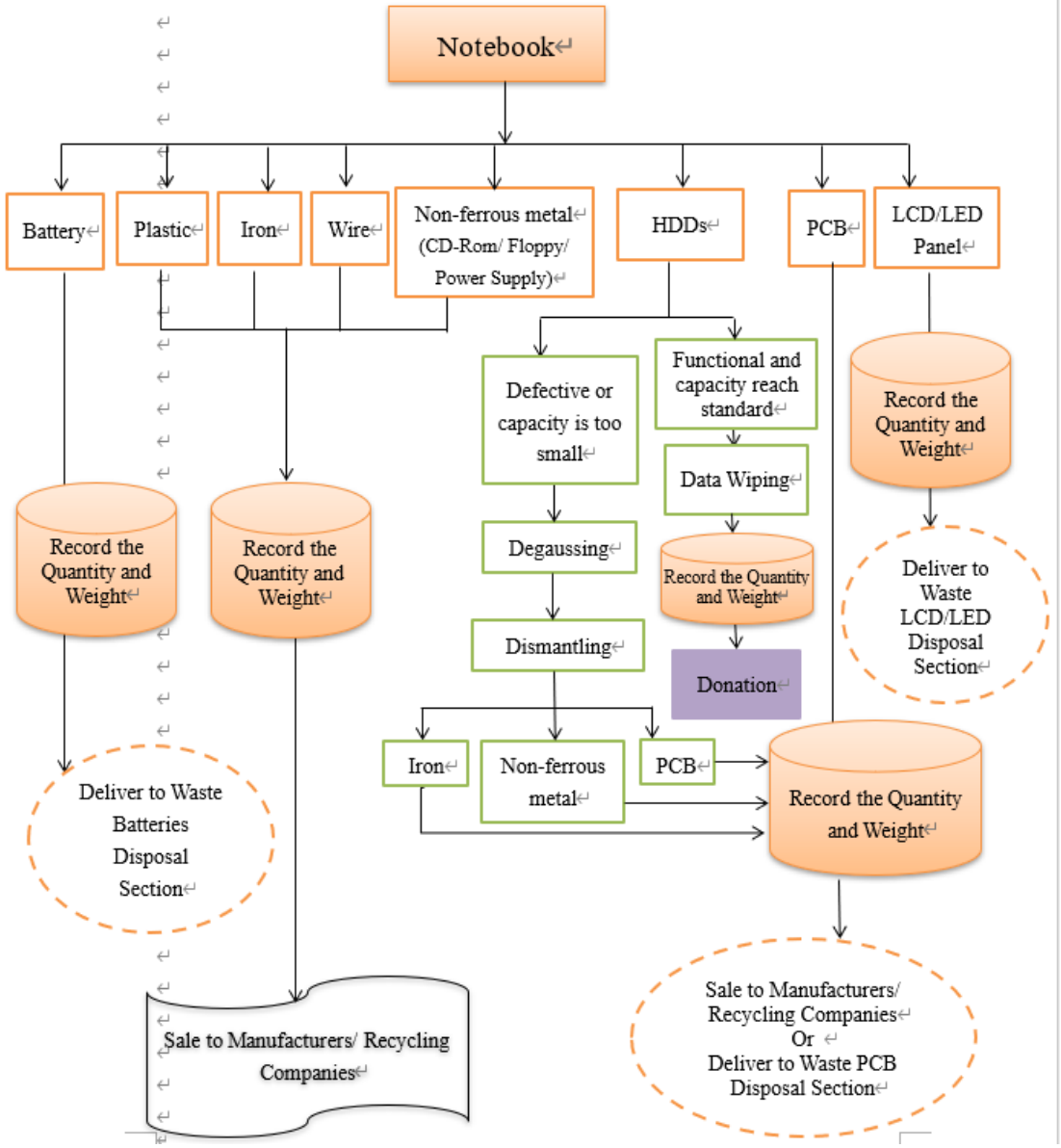


Figure 4D-8: Tablet Computer Recycling Process

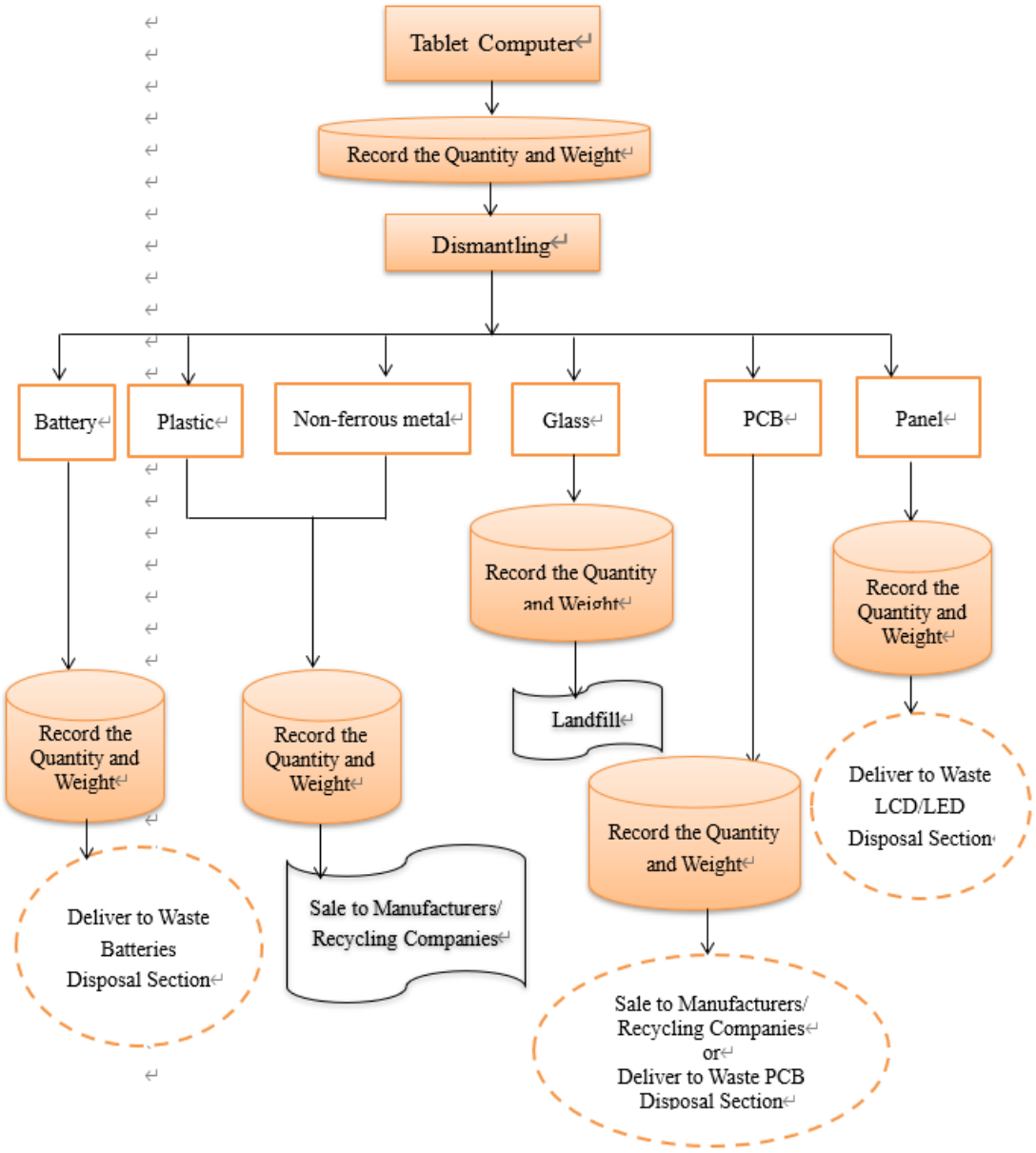


Figure 4D-6: Printers Recycling Process

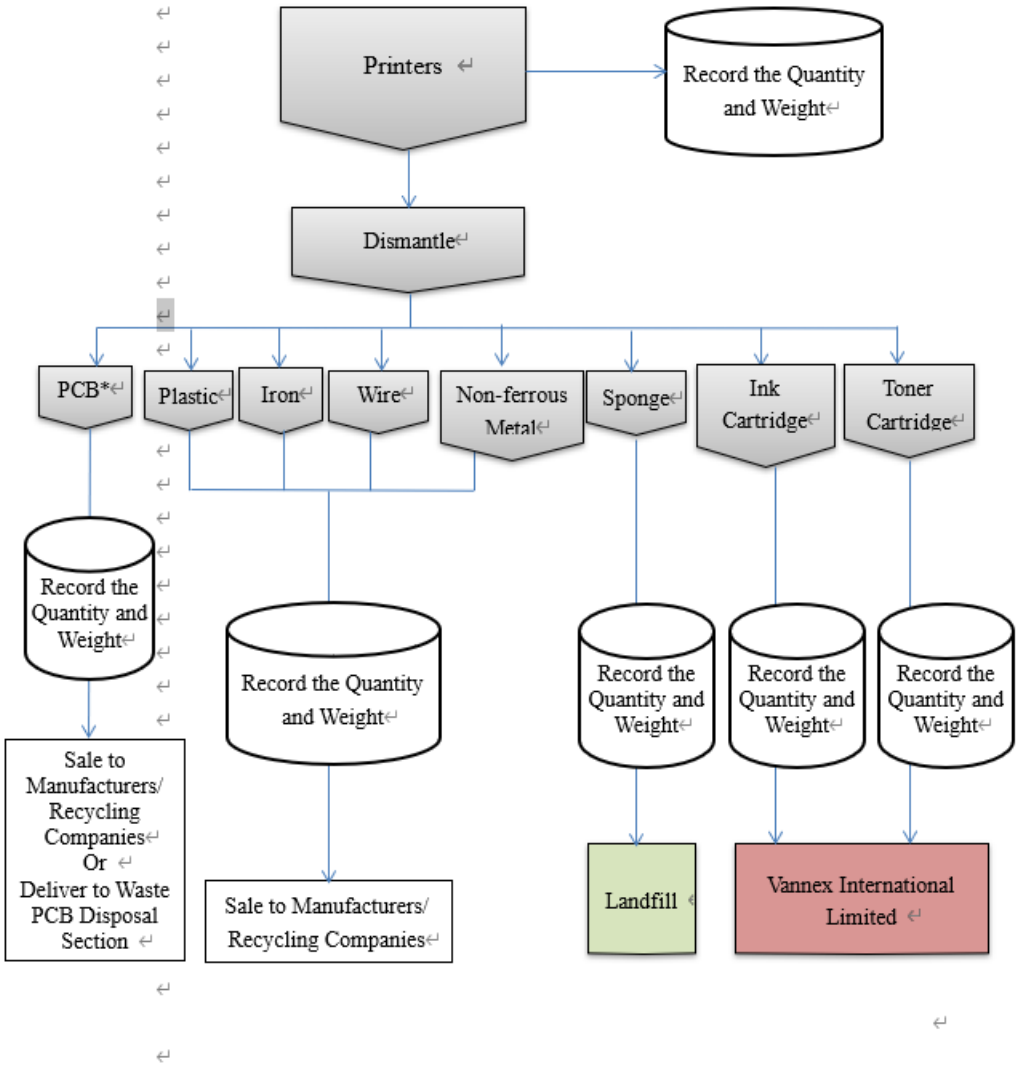


Figure 4D-7: Scanner Recycling Process