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ACE-EIA Paper 4/2022
For advice on 23 May 2022

Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report

Yuen Long South Effluent Polishing Plant

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report on “Yuen Long South Effluent Polishing Plant” (“the Project”) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-278/2022). The Drainage Services Department (DSD) (“the Applicant”) and its consultants will present the report at the meeting of the EIA Subcommittee.

ADVICE SOUGHT

2. Members’ views are sought on the findings and recommendations of the EIA report. The Director of Environmental Protection (DEP) will take into account the comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

BACKGROUND

3. The Government of the Hong Kong Special Administrative Region plans to develop Yuen Long South Development Area (YLSDA) to meet the territory’s medium to long-term need for housing development. Within the YLSDA, about 4.6 hectares of land at the southern tip is reserved for the proposed Yuen Long South Effluent Polishing Plant (YLSEPP) to treat the sewage generated from the YLSDA and other developments in the North West New Territories (NWNT).

4. The Applicant submitted the EIA report for the Project for approval under Section 6 of the EIAO. DEP, in consultation with relevant authorities, considered that the EIA report has met the requirements in the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of its exhibition for public inspection under Section 7(4) of the EIAO.

NEED FOR THE PROJECT

5. The YLSDA is proposed to accommodate a population of approximately 101,200 and generate about 13,630 employment opportunities on full development. The YLSEPP, with a maximum capacity of Average Dry Weather Flow (ADWF) up to 65,000m³/day, is therefore recommended to treat the sewage generated from the YLSDA and other developments in the NWNT.

DESCRIPTION OF THE PROJECT

6. The Project is to construct and operate a tertiary sewage treatment works comprising a sewage treatment plant and its associated supporting structures, including the upstream sewage pumping station, rising main for raw sewage and water reclamation facilities. Additional facilities for organic wastes co-digestion will also be operated within the YLSEPP. Construction works will commence in early 2028 with completion by 2032. The location and general layout of the Project is shown in **Figure 1**. Key elements of the Project include:

- (i) Construction of a tertiary Sewage Treatment Works with a maximum treatment capacity of 65,000m³/day;
- (ii) Reuse of the tertiary treated effluent within YLSEPP for non-potable use;
- (iii) Construction of sludge treatment facilities for treating sludge generated from YLSEPP and other nearby sewage treatment works;
- (iv) Construction of facilities for receiving and co-digesting pre-treated food or organic wastes for generating biogas as alternative energy source for plant operation; and
- (v) Other associated ancillary facilities and works (including effluent discharge pipe for the purpose of emergency discharge).

7. The Project is a Designated Project under Items F.1 and F.4, Part I, Schedule 2 of the EIAO, as it will involve sewage treatment works with an installed capacity of more than 15,000m³/day; and activity for the reuse of treated sewage effluent from a treatment plant.

ENVIRONMENTAL BENEFITS

8. According to the EIA report, the Project will bring about the following potential environmental benefits to the area upon its completion:

- (i) YLSEPP can provide comprehensive sewage treatment for the YLSDA and other developments in NWNT;
- (ii) YLSEPP has adopted the highest sewage treatment standard of tertiary treatment in Hong Kong, and the high effluent standard is suitable for the production of reclaimed water after further treatment. Most of the tertiary treated effluent will be reused, and any surplus tertiary treated effluent will be discharged to Yuen Long Nullah for river revitalisation. Such flow will bring beneficial effect to the Yuen Long Nullah; and
- (iii) YLSEPP is designed to receive approximately 100 wet tonnes of organic waste per day for co-digestion with sludge generated from sewage treatment, which will reduce the volume of sludge and food waste to be disposed of at the Environmental Protection Department (EPD)'s Sludge Treatment Facility and landfills. It would also allow energy recovery from biogas generation for utilisation within YLSEPP and hence reduce the carbon footprint of the Project. Moreover, the organic contents in digested sludge would be much reduced so as to minimise odour level in the downstream dewatering and offsite disposal process.

CONSIDERATION OF ALTERNATIVE OPTIONS

9. The EIA report has considered various development options, including alternative layouts, construction methods and sequence of works in order to avoid and minimise potential environmental impacts. The recommended options have taken into account environmental considerations, site constraints and operational requirements. The key approaches that have been adopted by the Applicant to avoid or minimise environmental impacts are summarised below:

- (i) carefully designing and optimising the location, size and arrangement of facilities as well as selecting more compact treatment technologies for primary treatment process and biological treatment of sewage to minimise the footprint and the associated environmental impacts to the surroundings;
- (ii) covering all odourous sources for collecting and conveying odourous gas for treatment at deodourisers with 95% odour removal efficiency before venting to the atmosphere;
- (iii) selecting ultra-violet irradiation as the recommended disinfection technology, and leaving no residuals in effluent and not harming the water life;

- (iv) providing standby Electrical and Mechanical (E&M) equipment to minimise the occurrence of emergency discharge and the associated environmental impacts; and
- (v) adopting sustainable design and green features such as green roof, effluent reuse, co-digestion of organic wastes with sewage sludge to enhance energy recovery, etc.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Water Quality Impact

10. The YLSEPP will treat the collected sewage to a tertiary treatment level (the highest treatment standard) to enable the treated effluent to be further reused as reclaimed water, with the surplus discharged to Yuen Long Nullah for river revitalisation.

11. The EIA study has assessed the potential water quality impacts under the worst case scenario in Year 2038 with the assumption that the planned adjacent water reclamation plant is not yet commissioned. It is predicted that the tertiary treated effluent from YLSEPP would provide better water quality than the existing Yuen Long Nullah water quality which provides an opportunity to revitalise the Yuen Long Nullah. Moreover, it is predicted that the YLSEPP would further reduce the Un-ionised ammonia, Total Phosphorus and *E.coli* levels in Deep Bay, while the overall Dissolved Oxygen levels in Deep Bay would be increased. With reference to the Water Quality Objectives (WQO), there would be a slight increase in Biochemical Oxygen Demand (with maximum increase of about 3.7%) and Total Inorganic Nitrogen (with maximum increase of about 2.4%) in Deep Bay, and the predicted high levels of these parameters are mainly contributed by other background pollution sources as non-compliance of WQO were predicted even without the Project. Upon commissioning of the planned adjacent water reclamation facility to further polish part of the treated effluent from the Project into reclaimed water, it will cut down the freshwater demand in the region, and further reduce the pollution loading discharge to the Deep Bay. The EIA report concludes that no adverse residual impact is anticipated.

12. Contingency measures such as standby units for all major equipment and back-up power with dual power supply will be provided for the proposed YLSEPP to prevent the need for emergency discharge as far as practicable. An Emergency Response Plan will be formulated prior to commissioning of the Project to minimise the impact of emergency discharges and facilitate subsequent management of the emergency.

Air Quality Impact

13. The EIA study has identified that odour arising from the Project mainly comes from sewage treatment, sludge treatment and food waste treatment operations. With the implementation of odour control measures including enclosure of odour emission sources, extraction fans and installation of de-odourisation units with at least 95% odour removal efficiency, the predicted cumulative odour levels at all the planned Air Sensitive Receivers (ASR) will comply with the odour criterion.

14. The predicted cumulative odour levels at two existing representative ASRs are up to 6.7 odour units, slightly higher than the criterion of 5 odour units. The above exceedance is mainly caused by the nearby chicken farm. Despite the slight odour exceedance at the above ASRs, the cumulative odour impacts will be substantially improved as compared with the existing condition, with five existing livestock farms to be removed as a result of the YLSDA. The EIA report concludes that there is no adverse residual odour impact arising from the Project.

15. Flue gas emission would be expected from the stacks of combined heat and power system and boiler of the Project. It is predicted that all relevant Air Quality Objectives would be met and no adverse air quality impact is predicted.

Ecology

16. The Project site is located in an area of extensive development in Yuen Long South and currently occupied by brownfield operations including open storage, light industrial developments and car workshop. No sites of conservation importance and other ecologically sensitive areas would be directly affected.

Other Environmental Impacts

17. Other environmental impacts including noise, waste management, land contamination, landscape & visual and hazard to life are relatively minor and have also been addressed in the EIA report. With the implementation of the recommended mitigation measures, the Project will comply with the relevant requirements of the EIA Study Brief and TM.

ENVIRONMENTAL MONITORING AND AUDIT

18. The EIA report has included an Environmental Monitoring and Audit (EM&A) Manual, which recommends an EM&A programme during the construction and operation phases of the Project. Key recommended EM&A requirements cover water and air quality issues.

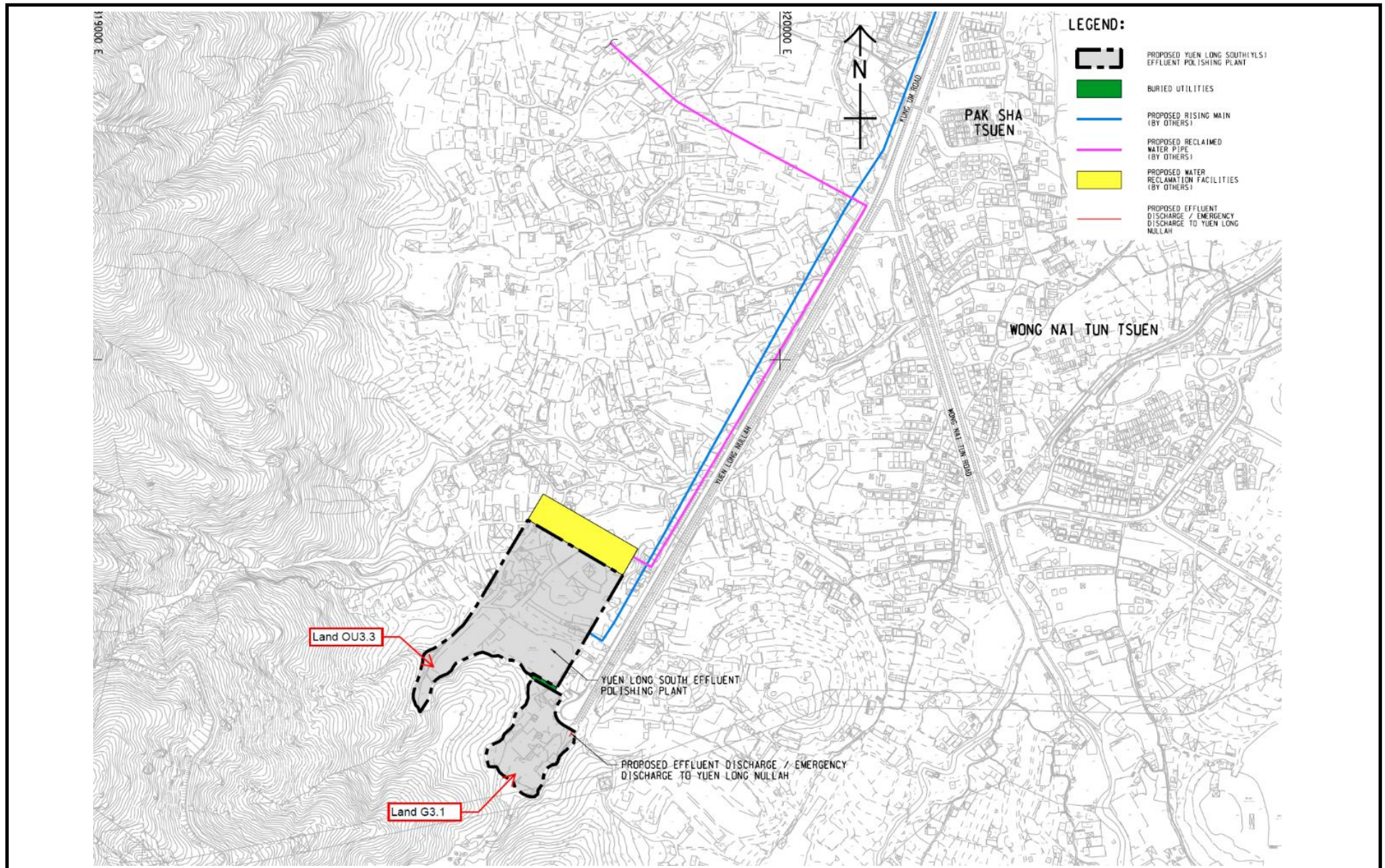
PUBLIC CONSULTATION


19. The Applicant has made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 6 April to 5 May 2022. A summary of all public comments received by EPD during the public inspection period and a gist of the main concerns raised in the public comments will be provided separately.

May 2022

Environmental Assessment Division

Environmental Protection Department



Project Title:	Yuen Long South Effluent Polishing Plant	EIA Application No.:	
Figure 1	General Layout of the Project	EIA – 278/2022	