MTR Corporation Limited

Tung Chung Line Extension

Wastewater Management Plan

(Condition 2.19 of EP-614/2022)

Verified by: Adi Lee 

Position: Independent Environmental Checker

Date: 11 September 2023

MTR Corporation Limited

Tung Chung Line Extension

Wastewater Management Plan

(Condition 2.19 of EP-614/2022)

Certified by: Edan Li

Position: Environmental Team Leader

Date: 11 September 2023

Tung Chung Line Extension

Works Contract No. 1201

Tung Chung West Station and Tunnels

Wastewater Management Plan

(Pursuant to the Condition 2.19 of Environmental Permit – No. EP-614/2022)

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1. Introduction

1.1. Project Background

1.1.1.1. The Railway Development Strategy 2014 (RDS-2014) announced by the Government of the Hong Kong Special Administrative Region included the conceptual scheme of Tung Chung West (TCW) Extension and a possible Tung Chung East (TCE) Station.

1.1.1.2. This new railway system has been included in the approved Schedule 3 Environmental Impact Assessment (EIA) for Tung Chung New Town Extension (TCNTE), which has included the new stations at TCE area and TCW area and the associated trackwork and tunnel. However, a separate Schedule 2 EIA study for this railway system is conducted to address the associated environmental impacts, taking into account the latest design.

1.1.1.3. The EIA Report for Tung Chung Line Extension (the Project) (AEIAR-235/2022) was approved on 12 July 2022. The Environmental Permit (EP) (No. EP-614/2022) was then issued on 9 August 2022. According to Clause 2.19 of the EP, the Permit Holder shall submit a Wastewater Management Plan (WWMP) for the construction works at Tung Chung West to the Director of Environmental Protection (DEP).

1.2. Purpose of this Plan

1.2.1.1. The open-cut work sites of Tung Chung West (TCW) Station are located at the vicinity of water sensitive areas including Yat Tung West Channel, Ma Wan Chung Bay, Estuary of Tung Chung River, Tung Chung Bay, and San Tau Beach Site of Special Scientific Interest (SSSI). According to the approved EIA Report (AEIAR-235/2022), these locations contain rich ecological resources including mudflats and other water sensitive areas. It is therefore important to formulate a management plan to minimise the chances of untreated construction wastewater from being accidentally discharged into these water sensitive receivers as shown in **Figure 1**.

1.2.1.2. This WWMP is prepared in accordance with the conditions stipulated in Section 2.19 of EP. The key objectives of this WWMP are to:

- Identify locations of discharge points;
- Describe treatment arrangements of wastewater including site run-off; and
- Propose measures to minimise impacts upon the nearby mudflats and other water sensitive areas in the vicinity.

1.3. Wastewater Management Legislation and Guidelines

1.3.1. General

1.3.1.1. Construction wastewater will be generated throughout the construction phase by the open-cut work sites at TCW Area, the following legislations and guidelines

should be strictly followed to control the quality of the discharged construction wastewater:

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (DSS-TM); and
- Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PN) 1/94 "Construction Site Drainage".

1.3.1.2. WPCO (Cap. 358) provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, the entire Hong Kong waters are divided into ten Water Control Zones (WCZs) and four supplementary WCZs. Each WCZ has a designated set of statutory Water Quality Objectives (WQOs). The WQOs set limits for different parameters that should be achieved to protect specific beneficial uses and conservation goals of each of the zones.

1.3.1.3. TCW area and the adjacent waterbodies are situated within the North Western WCZ and the water quality objectives for the North Western WCZ are summarised in **Table 1** below.

Table 1 WQOs of North Western WCZ

Water Quality Objectives (WQOs)	**Part or Parts of Zone**
Aesthetic Appearance	
• There should be no objectionable odours or discolouration of the water; • Tarry residues, floating wood, articles made of glass, plastic, rubber or any other substances should be absent; • Mineral oil should not be visible on the surface. Surfactants should not give rise to a lasting foam; • There should be no recognisable sewage derived debris; • Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels, or cause damage to vessels, should be absent; and • Waste discharges shall not cause the water to contain substances which settle to form objectionable deposits.	Whole Zone
Bacteria	

Water Quality Objectives (WQOs)	Part or Parts of Zone
• The levels of *E coli* should not exceed 180 counts per 100mL at bathing beaches, calculated as the geometric mean of all samples collected from March to October inclusive. Samples have to be taken at least 3 times a month at intervals of between 3 and 14 days.	Bathing Beach Subzones
• The levels of *E coli* should not exceed 610 counts per 100mL at secondary contact recreation sub-zones, calculated as the geometric annual mean of all samples collected in a calendar year.	Secondary Contract Recreation Subzones
Dissolved Oxygen	
• The depth averaged concentration of dissolved oxygen should not fall below 4 mg/L for 90% of the sampling occasions during the whole year; and • The concentration of dissolved oxygen should not be less than 2 mg/L within 2m of the seabed for 90% of the sampling occasions during the whole year.	Marine waters
pH	
• The pH of the water should be within the range 6.5-8.5 units; and • Human activity should not cause the natural pH range to be extended by more than 0.2 units.	Marine waters excepting Bathing Beach Subzones
Temperature	
• Waste discharges shall not cause the natural daily temperature range to change by more than 2.0°C.	Whole Zone
Salinity	
• Waste Discharges shall not cause the natural ambient salinity to change by more than 10%.	Whole Zone
Suspended Solids	
• Human activity should neither cause the natural ambient level to be raised by more than 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.	Marine waters
Ammonia	
• The un-ionised ammoniacal nitrogen level should not be more than 0.021 mg/L calculated as the annual average (arithmetic mean).	Whole Zone
Nutrients	

Water Quality Objectives (WQOs)	Part or Parts of Zone
• Nutrients should not be present in quantities sufficient to cause excessive or nuisance growth of algae or other aquatic plants.	Marine waters
• Without limiting the generality of the above point, the level of inorganic nitrogen should not exceed 0.3mg/L within Castle Peak subzone, expressed as the annual water column average.	Castle Peak Bay Subzone
• Without limiting the generality of the above point, the level of inorganic nitrogen should not exceed 0.5mg/L within Castle Peak subzone, expressed as the annual water column average.	Marine waters excepting Castle Peak Bay Subzone
Toxins	
• Waste discharges shall not cause the toxins in water to attain such a level as to produce significant toxic, carcinogenic, mutagenic or teratogenic effects in humans, fish or other aquatic organisms, with due regard to biologically cumulative effects in food chains and to interactions of toxic substances with each other; and • Waste discharges shall not cause a risk to any beneficial use of the aquatic environment.	Whole Zone

1.3.2. Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (DSS-TM)

1.3.2.1. Under Section 21 of the WPCO (Cap. 358), DSS-TM was issued to control the physical, chemical and microbial quality of effluent discharges into foul sewers, stormwater drains, inland and coastal waters. Specific limits apply for different areas are different between surface waters and sewers and the limits vary with the rate of effluent flow. Standards for effluent discharged into the inshore waters and marine waters of North Western WCZ as well foul sewer leading into the Government's sewage treatments plants are summarized in **Table 2**, **Table 3**, and **Table 4** respectively.

Table 2 Standards for effluents discharged into the inshore waters of North Western WCZ

Flow rate (m^3/day)	**≤10**	**>10 and ≤200**	**>200 and ≤400**	**>400 and ≤600**	**>600 and ≤800**	**>800 and ≤1000**	**>1000 and ≤1500**	**>1500 and ≤2000**	**>2000 and ≤3000**	**>3000 and ≤4000**	**>4000 and ≤5000**	**>5000 and ≤6000**
pH (pH units)	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9
Temperature (°C)	40	40	40	40	40	40	40	40	40	40	40	40
Colour (Lovibond units) (25mm cell length)	1	1	1	1	1	1	1	1	1	1	1	1
Suspended solids	50	30	30	30	30	30	30	30	30	30	30	30
BOD	50	20	20	20	20	20	20	20	20	20	20	20
COD	100	80	80	80	80	80	80	80	80	80	80	80
Oil & Grease	30	20	20	20	20	20	20	20	20	20	20	20
Iron	15	10	10	7	5	4	3	2	1	1	0.8	0.6
Boron	5	4	3	2	2	1.5	1.1	0.8	0.5	0.4	0.3	0.2
Barium	5	4	3	2	2	1.5	1.1	0.8	0.5	0.4	0.3	0.2
Mercury	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Other toxic metals individually	1	1	0.8	0.7	0.5	0.4	0.3	0.2	0.15	0.1	0.1	0.1
Total toxic metals	2	2	1.6	1.4	1	0.8	0.6	0.4	0.3	0.2	0.1	0.1
Cyanide	0.2	0.1	0.1	0.1	0.1	0.1	0.05	0.05	0.03	0.02	0.02	0.01
Phenols	0.5	0.5	0.5	0.3	0.25	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Sulphide	5	5	5	5	5	5	2.5	2.5	1.5	1	1	0.5
Total residual chlorine	1	1	1	1	1	1	1	1	1	1	1	1
Total nitrogen	100	100	80	80	80	80	50	50	50	50	50	50
Total phosphorus	10	10	8	8	8	8	5	5	5	5	5	5
Surfactants (total)	20	15	15	15	15	15	10	10	10	10	10	10
E. coli (count/100ml)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Note:
All units in mg/L unless otherwise stated; all figures are upper limits unless otherwise indicated.

Table 3 Standards for effluents discharged into the marine waters of North Western WCZ

Flow rate (m^3/day)	**≤10**	**>10 and ≤200**	**>200 and ≤400**	**>400 and ≤600**	**>600 and ≤800**	**>800 and ≤1000**	**>1000 and ≤1500**	**>1500 and ≤2000**	**>2000 and ≤3000**	**>3000 and ≤4000**	**>4000 and ≤5000**	**>5000 and ≤6000**
pH (pH units)	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
Temperature (°C)	45	45	45	45	45	45	45	45	45	45	45	45
Colour (Lovibond units) (25mm cell length)	4	1	1	1	1	1	1	1	1	1	1	1
Suspended solids	500	500	500	300	200	200	100	100	50	50	40	30
BOD	500	500	500	300	200	200	100	100	50	50	40	30
COD	1000	1000	1000	700	500	400	300	200	150	100	80	80
Oil & Grease	50	50	50	30	25	20	20	20	20	20	20	20
Iron	20	15	13	10	7	6	4	3	2	1.5	1.2	1
Boron	6	5	4	3.5	2.5	2	1.5	1	0.7	0.5	0.4	0.3
Barium	6	5	4	3.5	2.5	2	1.5	1	0.7	0.5	0.4	0.3
Mercury	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Flow rate (m^3/day)	≤10	>10 and ≤200	>200 and ≤400	>400 and ≤600	>600 and ≤800	>800 and ≤1000	>1000 and ≤1500	>1500 and ≤2000	>2000 and ≤3000	>3000 and ≤4000	>4000 and ≤5000	>5000 and ≤6000
Cadmium	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Other toxic metals individually	2	1.5	1.2	0.8	0.6	0.5	0.32	0.24	0.16	0.12	0.1	0.1
Total toxic metals	4	3	2.4	1.6	1.2	1	0.64	0.48	0.32	0.24	0.2	0.14
Cyanide	1	0.5	0.5	0.5	0.4	0.3	0.2	0.15	0.1	0.08	0.06	0.04
Phenols	0.5	0.5	0.5	0.3	0.25	0.2	0.13	0.1	0.1	0.1	0.1	0.1
Sulphide	5	5	5	5	5	5	2.5	2.5	1.5	1	1	0.5
Total residual chlorine	1	1	1	1	1	1	1	1	1	1	1	1
Total nitrogen	100	100	80	80	80	80	50	50	50	50	50	50
Total phosphorus	10	10	8	8	8	8	5	5	5	5	5	5
Surfactants (total)	30	20	20	20	15	15	15	15	15	15	15	15
E. coli (count/100ml)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000

Note:

All units in mg/L unless otherwise stated; all figures are upper limits unless otherwise indicated.

Table 4 Standards for effluents discharged into foul sewers leading into the Government's sewage treatment plants

Flow rate (m^3/day)	≤10	>10 and ≤200	>200 and ≤400	>400 and ≤600	>600 and ≤800	>800 and ≤1000	>1000 and ≤1500	>1500 and ≤2000	>2000 and ≤3000	>3000 and ≤4000	>4000 and ≤5000	>5000 and ≤6000
pH (pH units)	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
Temperature (°C)	43	43	43	43	43	43	43	43	43	43	43	43
Suspended solids	1200	1000	900	800	800	800	800	800	800	800	800	800
Settleable solids	100	100	100	100	100	100	100	100	100	100	100	100
BOD	1200	1000	900	800	800	800	800	800	800	800	800	800
COD	3000	2500	2200	2000	2000	2000	2000	2000	2000	2000	2000	2000
Oil & Grease	100	100	50	50	50	40	30	20	20	20	20	20
Iron	30	25	25	25	15	12.5	10	7.5	5	3.5	2.5	2
Boron	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5
Barium	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5
Mercury	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Copper	4	4	4	3	1.5	1.5	1	1	1	1	1	1
Nickel	4	3	3	2	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6
Chromium	2	2	2	2	1	0.7	0.6	0.4	0.3	0.2	0.1	0.1
Zinc	5	5	4	3	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6
Silver	4	3	3	2	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6
Other toxic metals individually	2.5	2.2	2	1.5	1	0.7	0.6	0.4	0.3	0.2	0.15	0.12
Total toxic metals	10	10	8	7	3	2	2	1.6	1.4	1.2	1.2	1.2
Cyanide	2	2	2	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.08
Phenols	1	1	1	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.1
Sulphide	10	10	10	10	5	5	4	2	2	2	1	1
Sulphate	1000	1000	1000	1000	1000	1000	1000	900	800	600	600	600
Total nitrogen	200	200	200	200	200	200	200	100	100	100	100	100
Total phosphorus	50	50	50	50	50	50	50	25	25	25	25	25

Flow rate (m^3/day)	≤10	>10 and ≤200	>200 and ≤400	>400 and ≤600	>600 and ≤800	>800 and ≤1000	>1000 and ≤1500	>1500 and ≤2000	>2000 and ≤3000	>3000 and ≤4000	>4000 and ≤5000	>5000 and ≤6000
Surfactants (total)	200	150	50	40	30	25	25	25	25	25	25	25

Note:
All units in mg/L unless otherwise stated; all figures are upper limits unless otherwise indicated.

1.3.3. Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PN) 1/94 "Construction Site Drainage".

1.3.3.1. ProPECC PN 1/94 on Construction Site Drainage provides guidelines for the handling and disposal of construction discharges. This note is applicable for the control of site run-off and wastewater generated during the construction phase of the Project.

1.3.3.2. The types of discharges from construction sites outlined in the ProPECC PN1/94, and are applicable to the TCW area include:

- Surface run-off;
- Groundwater;
- Wastewater from concrete batching and precast concrete casting;
- Wheel washing water;
- Water for testing and sterilisation of water retaining structures and water pipes;
- Wastewater from building construction;
- Acid cleaning, etching, and pickling wastewater; and
- Wastewater from site facilities.

2. Wastewater Discharge Points

2.1. Locations of the Discharge Points

2.1.1.1. According to the latest Project information, the wastewater generated by the construction sites at TCW area will be treated with facilities (i.e. silt interceptors and oil interceptors etc.) before being discharged to the drainage systems. The discharge locations are summarised at **Table 5** below and are shown in **Figures 2a** and **2b** for Phase 1 and Phase 2 respectively.

Table 5 Location of Discharge Points

Discharge Location ID	Location	Implementation Phases	Easting	Northing
D1	Near Yu Tung Road	Phases 1 and 2	811242	815614
D2	Near Chui Yat House	Phases 1 and 2	811248	815944

Note:

[1] The discharge locations are tentative and subjected to the discharge license under the WPCO.

3. Wastewater Treatment Arrangements

3.1. General

3.1.1.1. Given that the TCW area and the nearby water sensitive areas including mudflats and other water sensitive receivers, the following wastewater treatment measures should be strictly followed to minimise the amount of pollutants that are discharged into the nearby water sensitive areas.

3.2. Enhancement Measures Specific to TCW Area

3.2.1.1. While the Best Management Practices (BMPs) as stipulated in ProPECC PN 1/94 has recommended a comprehensive set of measures that should be implemented on-site, it is recommended that additional precautionary measures are implemented to address the unique circumstances with the ecological resources located in such close proximity.

3.2.1.2. Subject to actual site circumstances and subsequent detailed design, a barrier of 1m in height such as sheet piles or hoarding / water barriers with concrete footing should be installed along the western boundary of the construction site/works areas for TCW Station, this barrier shall be designed to contain the surface run-off from releasing to the nearby waterbodies in an uncontrolled manner during heavy rainfall. An interim wastewater treatment arrangement would be implemented (i.e. Phase 1), as shown in **Figure 2a**. During Phase 2, all the land within the works sites would be resumed, and the ultimate wastewater treatment arrangement would be implemented, as shown in **Figure 2b**.

3.2.1.3. It has been reviewed and confirmed that the enhancement measures are feasible considering the estimated quantities of run-off generated during heavy rainfall events and the space required for desilting facilities. For both Phase 1 and Phase 2 works, two wastewater treatment plants (WWTPs) would be provided on site, the treatment capacity for each WWTP would be 80m³/hr based on the assumption of Black Rainstorm Signal being hoisted for an hour. Furthermore, as mentioned in **Section 3.2.1.2** on the provision barrier along the western boundary of construction site/ works areas, it is anticipated that surface runoff would be contained within the construction site. In addition, the Contractor would further enhance the treatment capacity for both phases as a precautionary measure to further prevent discharge of untreated site runoff.

3.2.1.4. Prior to the commencement of the construction works, the Contractor shall also apply for a discharge licence under the WPCO and shall conduct necessary water quality measurements at the discharge locations listed under **Table 5** to demonstrate compliance with the licence conditions.

3.2.1.5. Regardless of the above additional precautionary measures, silt removal facilities, channels, and manholes should be maintained, and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding as necessary.

3.3. General Construction Activities

3.3.1.1. BMPs of management measures in controlling water pollution and good site management, as specified in ProPECC PN 1/94 should be followed as applicable to prevent run-off with a high level of suspended solids (SS) from entering the surrounding waters.

3.3.1.2. All effluent discharged from the construction site should comply with the standards stipulated in the DSS-TM. The following measures are recommended to protect the water quality of the nearby waters, and when properly implemented should be sufficient to adequately control site discharges to avoid water quality impacts.

3.3.1.3. Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps, and sedimentation tanks with sufficient retention time. Channels or earth bunds or sandbag barriers should be provided on-site during construction works to properly direct stormwater to such silt removal facilities. Perimeter channels should be provided on-site boundaries where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catch pits and perimeter channels should be constructed in advance of site formation works and earthworks.

3.3.1.4. To prevent soil erosion in case of inevitable excavation during rainstorms, temporarily exposed slope surfaces should be covered e.g. by a tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds as far as practicable. Intercepting channels should be provided (e.g. along the crest/edge of excavation) to prevent storm run-off from washing across exposed soil surfaces. Arrangements should always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.

3.3.1.5. The final surfaces of earthworks should be well compact and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.

3.3.1.6. Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections as far as practicable. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.

3.3.1.7. Open stockpiles of construction materials (e.g. aggregates, sand and fill materials) on sites should be covered with tarpaulin or similar fabric during rainstorms.

3.3.1.8. Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials, or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.

3.3.1.9. The temporary drainage system during the construction phase should cope with a design return period of 1 in 10 years rainfall as recommended in DSD Technical Circular No. 1/2017 "Temporary Flow Diversions and Temporary Works Affecting Capacity in Stormwater Drainage System" and DSD's practical Notes No. 1/2017 "Design rainfall and profile for temporary works within the Dry Season".

3.3.1.10. Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.

3.3.1.11. Requirements to be incorporated in the Project contract document should be established based on the water quality management measures as mentioned above.

3.4. Sewage from Construction Workforce

3.4.1.1. No discharge of sewage to the stormwater system, inland water, and marine water will be allowed. Adequate and sufficient portable chemical toilets should be provided in the works areas to handle sewage from the construction workforce. A registered collector should be employed to clean and maintain the chemical toilets on a regular basis.

3.4.1.2. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment. Regular environmental audit of the construction site should be conducted to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site.

3.5. Wastewater Discharge from Open Cut Excavation

3.5.1.1. Wastewater with a high level of SS should be treated before discharge by settlement in tanks with sufficient retention time. Oil interceptors should be provided to remove the oil, lubricants, and grease from wastewater. A discharge licence under the WPCO would be required for discharge to the stormwater drain. The Contractor might be stipulated under the discharge license to monitor the quantity and quality of discharge to ensure compliance with the conditions of the discharge license.

3.6. Accidental Spillage

3.6.1.1. Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap. 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes. The Contractor is also recommended to develop management procedures for chemicals used and prepare an emergency spillage handling procedure to deal with chemical spillage in case of an accident occurs.

3.6.1.2. Any services and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with the potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges. The service and maintenance as well as any chemical storage area would be avoided to position near the watercourse as a safeguard.

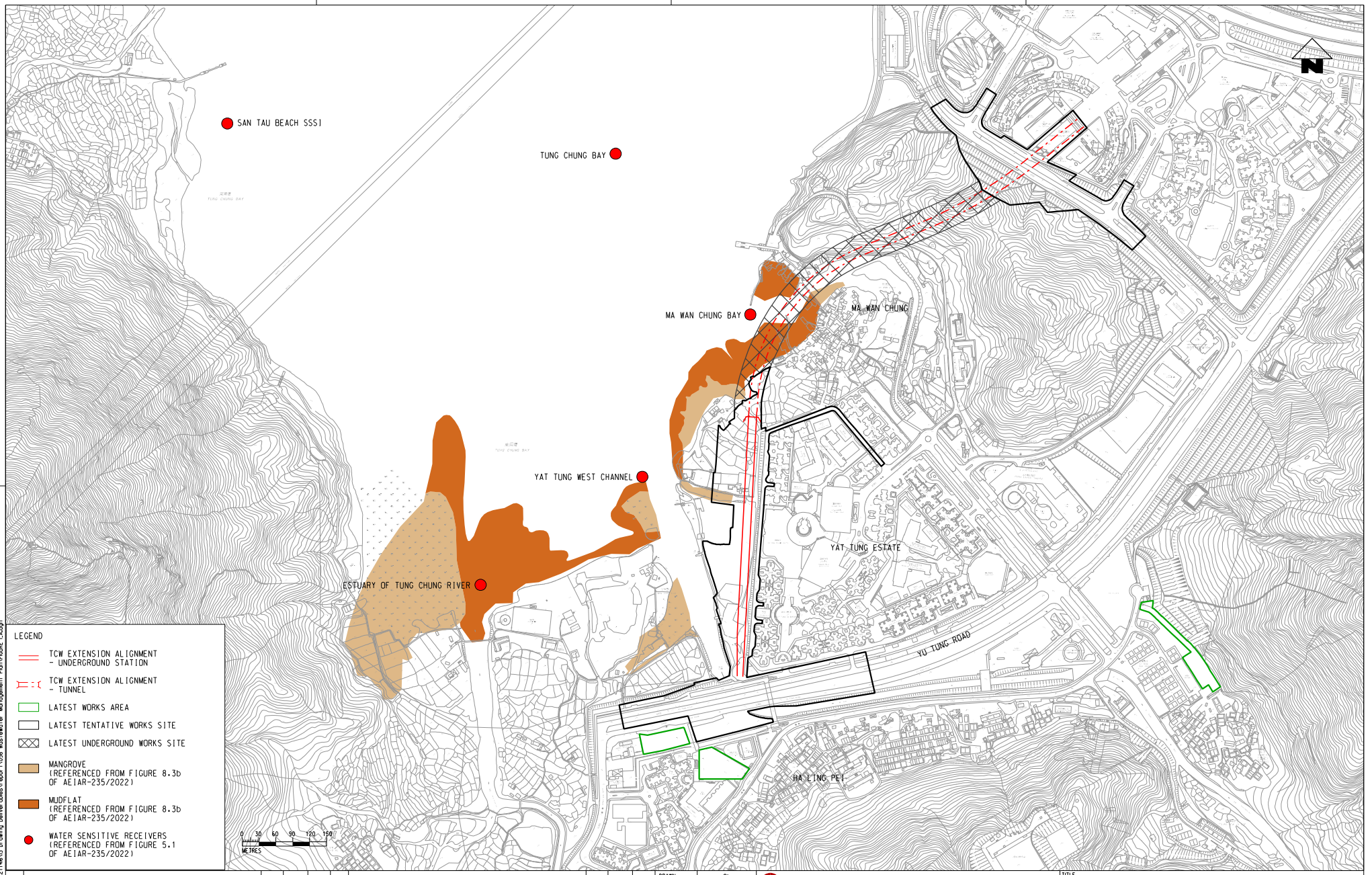
4. Conclusion

4.1.1.1. Considering that the open-cut work sites of TCW Station are located at the vicinity of nearby watercourses that are rich in ecological resources, it is important to formulate a WWMP to minimise the chances of having untreated construction wastewater from being accidentally discharged into the adjacent waterbodies.

4.1.1.2. This WWMP outlines the treatment arrangements of wastewater including site run-off, and to propose measures to minimise impacts upon the nearby mudflats and other water sensitive areas in the vicinity in view of the relevant wastewater management legislations and guidelines.

4.1.1.3. A total number of 2 discharge points have been identified at TCW area. Appropriate wastewater treatment measures such as providing perimeter drains, on-site treatment of wastewater prior to discharge should be followed. Additionally, a barrier such as sheet piles or hoarding / water barriers with concrete footing along the western boundary of the construction site/works areas for TCW Station should be installed prior to construction works to further minimise the water quality impact. With the implementation of the recommended measures, adverse water quality impact is not anticipated during the construction phase and impacts upon the nearby mudflats and other water sensitive areas in the vicinity.

Figures



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FILENAME: G:\env\project\27140\13 Drawing Deliverables\Report\026 Wastewater Management Plan\FIGURE 1_A.dgn

REV	DESCRIPTION	BY	DATE	APPROVED
B	SECOND ISSUE	GL	010323	FC
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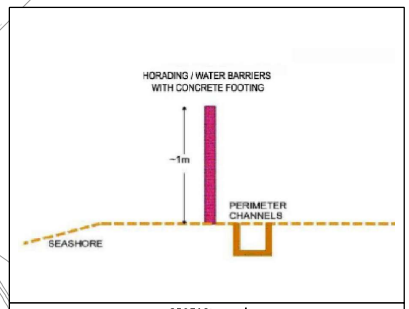
Contract 1201 - TUNG CHUNG WEST STATION AND TUNNELS

MAIN CONTRACTOR: BOUYGUES TRAVAUX PUBLICS; Dragages HongKong

CADD REF. FIGURE 1_A.dgn

TITLE: LOCATION OF WATER SENSITIVE RECEIVERS AT TUNG CHUNG WEST AREA

SCALE	DRAWING NO.	REV.
AS SHOWN	FIGURE 1	B



SECTION A-A'

MA WAN CHUNG

TUNG CHUNG BAY

WASTEWATER TREATMENT PLANT

DISCHARGE POINT

YAT TUNG ESTATE

A

A'

WASTEWATER TREATMENT PLANT

DISCHARGE POINT

YU TUNG ROAD

LEGEND

- LATEST WORKS AREA
- LATEST TENTATIVE WORKS SITE
- LATEST UNDERGROUND WORKS SITE
- HOARDING/ WATER BARRIERS WITH CONCRETE FOOTING
- U-CHANNEL
- WATER PIPE
- HOARDING

0 20 40 60 80 100
METRES

PLOT DRV: gb\common\standard\plotdrv\hp_druplk_a3-pdf-c.env,plt
MODELNAME: FIG 4J
FILENAME: G:\env\project\27746\13 Drawing Deliverables\Report\026 Wastewater Management Plan\FIGURE 2a_A.dgn
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Contract 1201 - TUNG CHUNG WEST STATION AND TUNNELS

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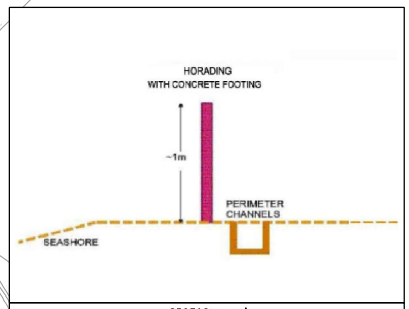
CADD REF. FIGURE 2a_A.dgn

TITLE: WASTEWATER TREATMENT ARRANGEMENT AT TUNG CHUNG WEST AREA (PHASE 1)

SCALE	DRAWING NO.	REV.
AS SHOWN	FIGURE 2a	A



SECTION A-A'

MA WAN CHUNG

TUNG CHUNG BAY

DISCHARGE POINT

WASTEWATER
TREATMENT PLANT

YAT TUNG ESTATE

A

A'

WASTEWATER
TREATMENT PLANT

DISCHARGE POINT

YU TUNG ROAD

LEGEND

- LATEST WORKS AREA
- LATEST TENTATIVE WORKS SITE
- LATEST UNDERGROUND WORKS SITE
- HOARDING WITH CONCRETE FOOTING
- U-CHANNEL
- WATER PIPE
- HOARDING

0 20 40 60 80 100
METRES

PLOT DRV: gb\common\standard\plotdrv\hp_druplk_a3-pdf-c.env,plt
MODELNAME: FIG 4J
FILENAME: G:\env\project\27746\13 Drawing Deliverables\Report\026 Wastewater Management Plan\FIGURE 2b_A.dgn
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CADD REF. FIGURE 2b_A.dgn

TITLE: WASTEWATER TREATMENT ARRANGEMENT AT TUNG CHUNG WEST AREA (PHASE 2)

SCALE	DRAWING NO.	REV.
AS SHOWN	FIGURE 2b	A