

Contract No. DC/2022/02 Drainage Improvement Works at Yuen Long

Pre-construction Survey and Translocation Report for Lin Fa Tei Section
CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03

Wing Tat Civil Engineering Co. Limited

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**Contract No. PM 10/2022 -
Independent Environmental Checker for Drainage Improvement Works at
Yuen Long – Stage 2**

**Verification of Pre-construction Survey and Translocation Report
(Lin Fa Tei Section CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03)**

9 August 2024

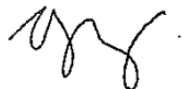
Dear Sir,

We refer to the Pre-construction Survey and Translocation Report under the captioned Project, which was certified on 8 August 2024 by the Ecologist appointed under Condition 2.3 of the Environmental Permit No. EP-596/2021 (hereinafter referred to as "EP").

We would like to inform you that we have no adverse comment on the captioned submission. Therefore, we hereby verify the abovementioned submission in accordance with EP Conditions 1.9 and 2.8.

Should you have any queries regarding the captioned, please contact our Hin Chan at 2828 5764 or the undersigned at 2828 5751.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED



Liz LO
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1 Introduction

1.1 Background

- 1.1.1 The Contract No. DC/2022/02 Drainage Improvement Works at Yuen Long – Stage 2 (hereafter as “The Project”) is carried out by the Drainage Services Department (DSD, the Project Proponent) to undertake drainage improvement works near four villages in Yuen Long, namely Sung Shan New Village, Tai Wo, Lin Fa Tei and Ha Che. The Project aims at enhancing the capacity of the existing drainage systems to lower the flood risk to these villages.
- 1.1.2 This Project is a Designated Project (DP) under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), with an approved Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-229/2021) and an Environmental Permit (EP-596/2021).
- 1.1.3 An ecological baseline survey was conducted for the Project, during which, two endemic freshwater crab species of conservation importance were recorded within the work sites. *Somanniathelphusa zanklon* was recorded at Lin Fa Tei and Ha Che, while *Cryptopotamon anacoluthon* was recorded in the upstream area at Ha Che. Both species are endemic to Hong Kong and considered to be “Endangered” and “Vulnerable” by the IUCN, respectively (IUCN 2023). The construction activities of the project will disturb their natural habitats thus potentially causing a direct loss of these two species due to their limited mobility.
- 1.1.4 To fulfil the conditions stipulated in Section 25.32 of the Particular Specification of the Contract, Conditions 2.8 of the Environmental Permit (EP-596/2021) as well as Sections 5.2.6 and 5.2.7 of the Environmental Monitoring and Audit Manual of the EIA, a Freshwater Crab Translocation Plan (FCTP) was prepared by the Environmental Team Ecologist such that aquatic species of conservation importance found within the works area will be translocated to selected receptor sites outside of the proposed works area in accordance with the FCTP.
- 1.1.5 Consequently, pre-construction surveys and translocation activities were carried out within the proposed drainage CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03 works sections of Lin Fa Tei (**Figure 1**) in accordance with the approved FCTP, as construction in the section of drainage was scheduled to commence on 20 March 2024. Pre-construction survey for other sections will be carried out and reported prior to the commencement of proposed works.
- 1.1.6 As stipulated in Section 2.5 of the approved FCTP, a Pre-construction Survey and Translocation Report will be prepared within 2 weeks after the translocation activities. Accordingly, this Report is prepared to detail the findings of the capture and translocation activities in the affected works areas in proposed drainage CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03 works sections of Lin Fa Tei.

2 Capture-Translocation Methodology

2.1 General

- 2.1.1 The capture and translocation scheme presented in this section is adopted from the FCTP. EPD approval of the methodology and approach detailed in the FCTP was sought prior to the pre-construction surveys and actual translocation activities.

2.2 Personnel

- 2.2.1 The pre-construction surveys and the translocation activities were carried out by a team of ecologists and supervised by the qualified ecologist with adequate relevant experience and whose credentials were certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC).

2.3 Permit

- 2.3.1 A special permit (**Appendix B**) in compliance with Sections 7 and 15 of the Wild Animals Protection Ordinance (Cap. 170) was obtained from AFCD as the pre-construction survey and translocation works involved the use of “appliance” i.e., hand nets to collect freshwater fauna in the streams.

2.4 Capture Activities

Collection Site and Survey Timing

- 2.4.1 As confirmed by the Contractor, the proposed drainage works in sections CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03 of Lin Fa Tei are scheduled to commence on 20 March 2024. Consequently, the capture-translocation activities were carried out on 11 to 13 March 2024, 14 days before the actual commencement of the drainage works, to avoid the recolonisation of *S. zanklon* and *C. anacoluthon* in this section after the pre-construction survey.
- 2.4.2 Pre-construction surveys were scheduled at time with lower surface water, avoiding periods of heavy rainfall to maximise the survey extent as well to ensure the safety of the surveyors.

Capture Methodology

- 2.4.3 Standard survey methodology as indicated in the approved FCTP were adopted during the pre-construction surveys.
- 2.4.4 Hand netting was used by actively sweeping the potential micro-habitats and hiding spaces that are favoured by the crabs (Stanton & Leven 2016, Stanton *et. al.* 2017) such as rocks, organic debris, leaf litter, and riparian vegetation. Any species of conservation importance flushed or caught by this practice were sorted and collected.

2.4.5 Kick-netting was also conducted moving parallel from downstream to upstream, where hand net opening was positioned facing the water current at suitable locations. Using the toe or heel, the streambed substrate in front of the net was disturbed by kicking such that aquatic species dislodged by the disturbance were trapped in the net. All species with conservation importance captured were identified, measured, and photographed.



Plate 1. Size measurement of the captured *C. anacoluthon*.

Marking

2.4.6 Using an ink marker, dorsal side of the carapace of the captured individuals of *S. zanklon* and *C. anacoluthon* were marked with their assigned individual number/code. Earlier laboratory and field trials had established that crab survival and behaviour was unaffected by paint marking on the carapace (Bell et. al. 2003).



Plate 2. Marking the carapace of captured *C. anacoluthon*.

2.5 Translocation Activities

- 2.5.1 To avoid translocated individuals from re-entering the streams within the works area, suitable receptor sites outside and far from the affected sections were selected. To avoid stress and mortality, the collected freshwater crab was immediately translocated shortly after capture. Translocation duration from the collection site to the receptor site took less than one hour as the receptor site had accessible routes.
- 2.5.2 The captured *C. anacoluthon* was translocated to the section of a shallow slow-flowing semi-natural watercourse with silt and rocky substrate surrounded by agricultural lands at Lin Fa Tei. The proposed receptor site has a mixture of silt and rocky substratum with abundant riparian vegetation such as *Ipomoea cairica* and *Pennisetum purpureum*. This section was considered as a suitable receptor site primarily suitable for *S. zanklon*; however, given that no upland sites are available near Lin Fa Tei, for *C. anacoluthon*, and considering the stream substrate and available vegetation also fits the habitat requirements of *C. anacoluthon*, this chosen as the receptor site for captured individual of *C. anacoluthon* as well.
- 2.5.3 Upon arrival to the receptor site, acclimatisation was conducted by gradually mixing the water at receptor sites into the plastic container. This would lower the risk of mortality due to temperature shock on the translocated freshwater crab.



Plate 3. Releasing of *C. anacoluthon* to the receptor site.

3 Pre-construction Survey Results

3.1 Freshwater Crab Species and Abundance

3.1.1 One freshwater crab was collected, marked, and translocated from Lin Fa Tei within section CH.A0.00 ~ CH.A200.00. The captured individual was observed on the third (13 March 2024) night of the three consecutive pre-construction surveys. No crabs were collected on 11 March and 12 March 2024. Details of the captured individual are summarized in **Table 1** below.

Table 1 Summary of Freshwater Crab Species captured during the Pre-construction Surveys

Species	ID No./ Code	Sex	Carapace Size (mm)	Date of Capture	Time of Capture	Remarks
<i>C. anacoluthon</i>	FC1	F	24.0	13-Mar-24	20:05	

3.1.2 The captured *C. anacoluthon* was found by kick sampling within the stream bed roughly 5 meters downstream from the concrete water gate within section CH.A0.00 ~ CH.A200.00. It is noted that waterflow and depth during the first survey date (11 March 2024) was high and the waterflow gradually reduced each day afterwards. This is likely due to rainfall recorded on the morning of 11 March 2024, although the rainfall was not considered to be heavy. The recorded rainfall may also have led to stream fauna (including the targeted crab species) being flushed away. Evidently, no aquatic larvae of Odonata were recorded in all three nights, and only one individual of *C. anacoluthon* was captured. Other reasons explaining the lack of crabs encountered on both the survey dates of 11 March and 12 March maybe be that the remaining individuals of crabs within the stream is simply active in other segments of the stream during the survey date.

3.1.3 Detailed findings and representative photographs of the captured *C. anacoluthon* is presented in **Appendix A**.

3.2 Incidental Catch/Sightings

3.2.1 Albeit the pre-construction surveys only targeted *S. zanklon* and *C. anacoluthon*, several fauna species were also unintentionally caught during the pre-construction surveys (**Appendix C**). Species of conservation importance incidentally observed is summarized in **Table 2** below.

3.2.2 A single individual of an adult Spotted Narrow-mouthed Frog was found on a slope in the eastern section of section CH.A0.00 ~ CH.A200.00. As this specimen is mobile and is able to avoid the construction area once the construction work commences, it was not translocated to the receptor site. The specimen was brought to nearby agricultural lands instead, which is the preferred habitat of the species.

Table 2 Other Species of Conservation Importance Captured during the Pre-construction Surveys

Species	Conservation and Protection Status ¹	Distribution and Rarity ²
Herpetofauna		
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central New Territories.

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), China Species Red List (Wang & Xie 2004), IUCN (2024), China State Major Protection Status, CITES (2024), Native fish of conservation concern in HK (KFBG 2019), BSAP Marine Fishes Sub-group (2014), Cap. 170 and Cap. 586.
 - a. Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened.
2. Distribution and rarity follow the data of the latest HKBIH (AFCD 2024).

3.2.3 Additionally, it was noted that no individuals of *Cryptopotamon anacoluthon* or *Somanniathelphusa zanklon* were recorded in the receptor site as well.

4 Post-translocation Monitoring

4.1.1 According to Section 5.2.5 of EM&A Manual for the Project, monthly post-translocation monitoring shall be conducted for at least 12 months after pre-construction surveys to monitor their establishment.

4.1.2 During the monitoring, active visual search by hand netting and kick sampling for aquatic fauna species would be performed at the respective receptor sites. Potential micro-habitats and hiding spaces that is favoured by the crabs such as rocks, organic debris, leaf litter, and riparian vegetation etc., will also be overturned or raked.

4.1.3 Upon discovery of any marked individuals from the pre-construction survey, date and time of capture, size and health condition of the individual will also be recorded once again.

4.1.4 The practice of mark and recapture of the translocated population of *the C. anacoluthon* at the receptor site can then be used to estimate population size, as well as inform the health and survival status of the translocated population.

5 Conclusion

5.1.1 To avoid/minimise potential direct impacts to the local population of the endemic freshwater crab species, an individual of *Cryptopotamon anacoluthon* was captured, marked, and translocated during the pre-construction surveys in Lin Fa Tei for section CH.A0.00 ~ CH.A200.00 and CH.C117.50 ~ CHD.239.03 on 11 to 13 March 2024.

5.1.2 The captured endemic freshwater crab was translocated to the identified receptor site indicated in the approved Freshwater Crab Translocation Plan. The captured *Cryptopotamon anacoluthon* was translocated to a section of a shallow slow-flowing semi-natural watercourse with silt and rocky substrate surrounded by agricultural lands at Lin Fa Tei which has comparable characteristics with the collection site.

5.1.3 Post-translocation monitoring for at least 12 months to monitor the establishment and effectiveness of the measures given to the endemic freshwater crabs shall be conducted.

- 5.1.4 As a conservation measure, an individual of Spotted Narrow-mouthed Frog incidentally captured throughout the survey period was released into agricultural lands near the survey location.

6 References

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Stanton, D.J. & M.R. Leven. 2016. Distribution, habitat utilisation and conservation status of the freshwater crab, *Somanniathelphusa zanklon* Ng & Dudgeon, 1992 (Crustacea: Brachyura: Gecarcinucidae) endemic to Hong Kong. *Journal of Threatened Taxa* 8(3): 8564–8574; <http://dx.doi.org/10.11609/jott.2070.8.3.8564-8574>

Stanton, D.J., M.R. Leven & T.C.H. Hui. 2017. Distribution of *Cryptopotamon anacoluthon* (Kemp, 1918) (Crustacea: Brachyura: Potamidae), a freshwater crab endemic to Hong Kong. *Journal of Threatened Taxa* 9(2): 9786–9794; <http://doi.org/10.11609/jott.3007.9.2.9786-9794>

Wang & Xie. 2004. China Species Red List (CSRL). Higher Education Press.

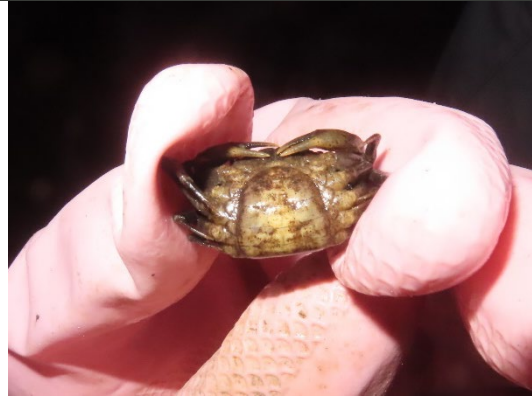
Appendices

Appendix A

Photos of Collected *C. anacoluthon*

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Cryptopotamon anacoluthon FC1



Appendices

Appendix B

Special Permit obtained from AFCD under Cap. 170



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22 December 2023

**Permission to Possess Hand Nets for the Surveys
and Translocation of Aquatic Fauna**

I hereby give permission to:

**HUI, Chung Hong; CHAN, Lai Ying; CHAN, Lap Hang; CHEUNG, Hin Kit;
HUNG, Pak Yam; LEE, Wing Yau; MA, Chun Ning; TAM, Hoi Yan and TAM, Sze
Hon of Aurecon Hong Kong Limited** to possess hand nets to capture freshwater
macro-invertebrates for surveys and translocation, subject to the conditions on the
reverse side of this permit.

The Special Permit is given in accordance with Section 15 of the Wild Animals Protection Ordinance (Cap.170).

This Special Permit expires on **31 December 2024.**

(Chan Kin Fung)
for Director of Agriculture, Fisheries and Conservation

Mr. Tommy HUI
Aurecon Hong Kong Limited
122-127 Commercial Centre,
Palm Springs,
Yuen Long,
New Territories,
Hong Kong

**Conditions of Permission to Possess Hand Nets for the Surveys
and Translocation of Aquatic Fauna**

1. This permission is limited to the possession of hand nets by HUI, Chung Hong; CHAN, Lai Ying; CHAN, Lap Hang; CHEUNG, Hin Kit; HUNG, Pak Yam; LEE, Wing Yau; MA, Chun Ning; TAM, Hoi Yan and TAM, Sze Hon of Aurecon Hong Kong Limited to capture freshwater macro-invertebrates for surveys and translocation at Lin Fa Tei and Ha Che in Yuen Long under the project "Drainage Improvement Works at Yuen Long" (Contract No. DC/2022/02) as proposed to this department on 5 December 2023.
2. This permission does not exempt the permit holders from having to acquire any other necessary permission under the Laws of Hong Kong.
3. This permission does not authorise the entry to any leased land or licensed area or the collection or disturbance of the flora or fauna therein, in which case the prior approval of the lessees or the licence holders would be necessary.
4. The permit holders shall release the captured target species to the approved receptor sites.
5. The permit holders shall handle the animals humanely and in a manner that will avoid their suffering.
6. The permit holders shall release all the accidentally captured animals other than the target species on site immediately. The permit holders shall hand over any protected wild animals listed under Schedule 2 to the Wild Animals Protection Ordinance or scheduled species under the Protection of Endangered Species of Animals and Plants Ordinance accidentally hurt by the nets and deemed unsuitable for immediate release to this Department as soon as possible.
7. The permit holders shall produce a copy of this permit for inspection on demand by any officer of this Department or police officer.
8. The permit holders shall provide a report on the location, quantity and species of specimens surveyed to this Department upon request.
9. The Director of Agriculture, Fisheries and Conservation reserves the right to recall or cancel this permission at any time.

* End of Conditions *

December 2023
Agriculture, Fisheries and Conservation Department

Appendices

Appendix C

Incidental Catch/Sightings during the Pre-construction Surveys



Table 1. Incidental Catch/Sightings during the Pre-construction Capture Surveys

Species Name	Conservation Status ⁽¹⁾	Hong Kong Status ⁽²⁾	Abundance	
			CH.A0.00~ CH.A200.00	CH.C117.50 CH.D239.03
Amphibians				
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central New Territories.	1	
Brown Tree Frog <i>Polypedates megacephalus</i>	-	Widely distributed throughout Hong Kong.	1	
Freshwater Fishes				
Snakehead Murrel <i>Channa striata</i>	-	Uncommon		8
Variable Platyfish <i>Xiphophorus variatus</i>	-	Common		1
North African Catfish <i>Clarias gariepinus</i>	-	-		6
Broken-band Hillstream Loach <i>Liniparhomaloptera disparis</i>	-	Common		1
Aquatic Invertebrates				
Housefly Larva <i>Muscidae sp.</i>	-	-	2400	
Polychaete <i>Polycheata sp.</i>	-	-	25	
Apple Snail <i>Pomacea canaliculata</i>	-	-	4	100
Blood Worm <i>Chironomidae sp.</i>	-	-	1700	
Freshwater Clam <i>Corbicula fluminea</i>	-	-	1	
Freshwater Snail <i>Sulcospira hainanensis</i>	-	-	1	
Notes:				
1. Conservation and protection status refers to Fellowes et al. (2002), IUCN (2023), RLCV (Jiang et al., 2016), List of National Key Protected Wild Animal (2021), CITES (2023), Cap. 170 and Cap. 586.				
a. Conservation status by RLCV (Jiang et al., 2016): NT = Near Threatened.				
2. Distribution and rarity follow the data of the latest HKBIH (AFCD, 2024).				

Table 2. Photos of captured aquatic species of conservation importance



Appendices

Appendix D

Site Photos of Capture and Receptor Sites



Collection Site CH.A0.00 ~ CH.A200.00



Collection Site CH.A0.00 ~ CH.A200.00

CH.C117.50 ~ CH.D239.03



Receptor Site



Appendices

Appendix E

Survey Data Sheet



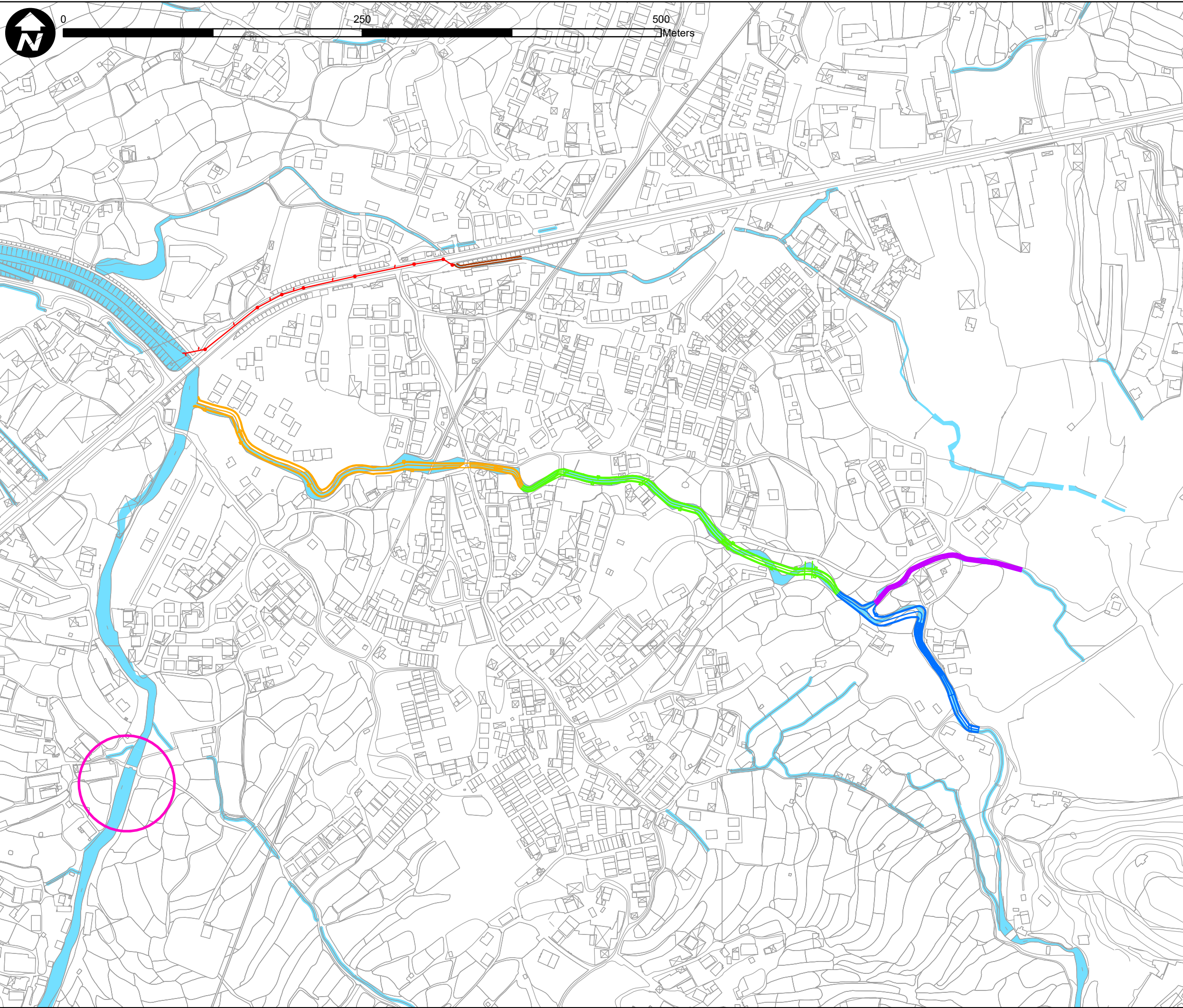
Figures

Figure 1

Collection and Receptor Sites of *C. anacoluthon* and *S. zanklon*

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- Not Covered by Pre-construction Survey
- Section CH.A 818.86 ~ CH.A 500.00
- Section CH.A 500.00 ~ CH.A 200.00
- Section CH.A 0.00 ~ CH.A 200.00
- Section CH.B 0.00 ~ CH.B 149.77
- Section CH.C 117.50 ~ CH.D 239.03
- Proposed Receptor Site for *Cryptopotamon anacoluthon* and *Somanniathelphusa zanklon* Captured at Lin Fa Tei
-
- Watercourse

Project Title:
 Contract No. DC/2022/02 Drainage Improvement Works at Yuen Long - Stage 2 (Subcontract No. DC/2022/02/SC/004 Provision, Operation and Maintenance of Environmental Services)

Figure Title:
 Collection and Receptor Sites of *C. anacoluthon* and *S. zanklon* In Fa Tei



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Checked By:	NT	Date:	19 Mar 2024
Approved by:	TH		
Figure Number:	Figure 1	Revision:	0

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