Translocation Report for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

Northeast New Territories Landfill Extension (NENTX)

0092/22/ED/0142 01 | 11 October 2022
Formal Submission

Veolia Environmental Services Hong Kong Ltd.

Consulting Engineers . Planners . Managers
工程設計 . 策劃 . 統籌

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Our Ref.: CL/91823/0194-VES
Date: 20 December 2022

By Email

Veolia Environmental Services Hong Kong Limited
40/F, One Taikoo Place
979 King's Road
Quarry Bay
Hong Kong

Attn.: Mr. Alvin Kam

Dear Sir

Re: Contract No. EP/SP/77/15
North-East New Territories Landfill Extension (NENTX)
Submission of Translocation Report for the Endemic Freshwater Crab Somanniathelphusa zanklon

I refer to Conditions 2.8 and 2.10 under Environmental Permit No. EP-292/2007 and Conditions 2.6 and 2.8 under Further Environmental Permit No. FEP-01/292/2007, regarding the submission of a report for translocation. I hereby verified the captioned "Translocation Report for the Endemic Freshwater Crab Somanniathelphusa zanklon" dated 11 October 2022.

Yours faithfully
MEINHARDT INFRASTRUCTURE AND ENVIRONMENT LTD

Claudine Lee
Independent Environmental Checker

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Ref: P521530-0000-REV-NN-0019

By Email

20 December 2022

Meinhardt Infrastructure & Environment Ltd.
10/F Genesis
33-35 Wong Chuk Hand Road
Hong Kong

Attn: Ms. Claudine Lee,

Dear Claudine,

Re: Contract No. EP/SP/77/15
Northeast New Territories Landfill Extension
Submission of Translocation Report for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

In accordance with the requirement specified in Conditions 2.8 and 2.10 of Environmental Permit No. EP-292/2007 and Conditions 2.6 and 2.8 of Further Environmental Permit No. FEP-01/292/2007, we are pleased to submit the certified "Translocation Report for the Endemic Freshwater Crab *Somanniathelphusa zanklon*" dated on 11 October 2022 for your verification.

Should you require any further information or clarification, please do not hesitate to contact the undersigned or our Mr. Keith Chau on 3664 6788.

Yours faithfully,
For and on behalf of
Aurecon Hong Kong Limited

Fredrick Leong
Environmental Team Leader

Encl.
1. Translocation Report for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

cc.
1. IEC - Ms. Claudine Lee (By email: claudinelee@meinhardt.com.hk)
2. IEC Representative - Mr. Jimmy Lui (By email: jimmylui@meinhardt.com.hk)

Document Control

Document Information

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Client Information

Client	Veolia Environmental Services Hong Kong Ltd.
Client Address	40/F, One Taikoo Place, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong
Client Contact	Mr. William Wan
Client Document No.	NENTX-FUG-RP-E-EM-003-I01

Document History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
00	03 Aug 2022	Formal Submission	For ET's certification and IEC's verification	KJB	FN	CY
01	11 Oct 2022	Formal Submission	For AFCD's and EPD's comments	KJB	FN	CY

Project Team

Initials	Name	Role
CY	Colin Yung	Project Manager
FN	Fenelyn Nabuab	Ecologist
KJB	Kalvin Jay Boregon	Ecologist
JT	Jacky Tam	Ecologist
JPT	Jhomar Tillo	Ecologist
RL	Ray Li	Environmental Consultant
SMR	Sheila Marie Rabi	GIS Specialist/ Ecologist

Contents

Appendices

List of Plates in the Main Text

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1. Introduction

1.1.1 The North East New Territories (NENT) Landfill is reaching its designed capacity. The Environmental Protection Department (EPD) is actively pressing ahead the NENT Landfill Extension to extend the capacities of the landfill, with the view to meeting the long-term waste disposal needs of Hong Kong.

1.1.2 The North East New Territories Landfill Extension (the NENTX Project) is a designated project. The Environmental Impact Assessment (EIA) Report was approved with conditions on 20 September 2007 and the Environmental Permit (EP) EP-292/2007 (the "EP) was issued on 26 November 2007. Additionally, a Further Environmental Permit FEP-01/292/2007 (the "FEP") was also issued under the EIA Ordinance on 28 April 2022.

1.1.3 In order to fulfil the FEP conditions 2.6 and 2.8 on translocation on the endemic freshwater crab *Somanniathelphusa zanklon* surveys were carried out with the purpose of providing details for the formulation and implementation of translocation scheme for this endemic freshwater crab recorded within the NENTX Project area prior to the commencement of the NENTX Project.

1.1.4 Specifically, FEP condition 2.6 states that "the Permit Holder shall, no later than six month before the commencement of construction of the Project, submit to the Director for approval four hard copies and one electronic copy of a detailed methodology for capture surveys and translocation on the endemic freshwater crab *Somanniathelphusa zanklon* affected by the Project area and monitoring requirements on the establishment of the *Somanniathelphusa zanklon* community in the translocated site. The submission shall be prepared by a qualified botanist or ecologist and shall be certified by the ET Leader and verified by the IEC as conforming to the information and recommendations contained in the approved EIA Report".

1.1.5 To fulfil the abovementioned FEP conditions, a "Revised Translocation Proposal for the Endemic Freshwater Crab *Somanniathelphusa zanklon*" (NENTX-FUG-RP-E-EM-I01 Revised Translocation Proposal) (the "Proposal") was prepared and agreed upon with EPD and Agriculture, Fisheries and Conservation Department (AFCD).

1.1.6 The NENTX Design-Build-Operate (DBO) Contractor (the Contractor), on behalf of EPD/LDG, will be responsible for carrying out the capture surveys and translocation works in accordance with the Proposal.

1.1.7 The NENTX Design-Build-Operate (DBO) contract was awarded to Veolia Environmental Services Hong Kong Ltd. (Veolia) and Fugro Technical Services Limited (Fugro) was appointed by Veolia to implement the capture survey and translocation works in accordance with the Proposal.

1.2 Purpose of this Document

1.2.1 This Translocation Report for the Endemic Freshwater Crab *Somanniathelphusa zanklon* (the "Report") was prepared to detail the findings of the capture and translocation activities in fulfilment of FEP conditions 2.6 and 2.8 and as basis to fulfil these aforementioned FEP conditions in addition to EIA Report Approval Condition no. 4 for the post-translocation monitoring of the translocated endemic freshwater crab *S. zanklon* community in the recipient site.

1.3 Structure of the Report

1.3.1 Succeeding this Section 1 Introduction, the remainder of this Detailed Translocation Report is presented as follows:

- Section 2 details the methodology of the capture-translocation activities;
- Section 3 details the survey results of the capture-translocation activities;
- Section 4 presents the summary and conclusion; and
- Section 5 details the post-translocation monitoring programme.

2. Capture-Translocation Methodology

2.1.1 This section presents the methodology and approach of the capture surveys and translocation with reference to FEP condition 2.8 which states that the capture surveys, and translocation of the endemic freshwater crab *S. zanklon* shall be carried out according to the submission approved under FEP condition 2.6 before commencement of construction of the Project.

2.1.2 Further, the methodology was in accordance with the approved Proposal.

2.2 The Capture-Translocation Area

2.2.1 The survey area for the translocation of *S. zanklon* covered the watercourse sections where the crab was previously recorded between July to August of 2021, i.e. watercourse section from the upstream deep pool to slow flowing downstream section adjacent to truck water filling station; and those areas within the NENTX Project Site where the species was recorded in the literature review (i.e. the ditch in the approved EIA study) (**Appendix A**). The survey area also covered the identified recipient site (**Appendix B**) to re-confirm the suitability prior to the start of translocation survey.

2.2.2 The translocation survey, although targeted *S. zanklon*, also noted that in case of presence of other aquatic fauna of conservation importance, the observation would be reported to EPD and AFCD to discuss on the way forward.

2.3 Personnel

2.3.1 The capture-translocation survey team was led by a qualified ecologist with minimum of five years' experience in aquatic ecology or other related experience as accepted by AFCD and EPD. In particular, the survey team leader have the experience in surveys of *S. zanklon*.

2.4 Capture Activities

2.4.1.1 The capture-translocation activities were conducted in a period close to the actual commencement of the works that affect the concerned watercourses(s). It started no earlier than one month prior to the commencement of site clearance works, with the last day of the capture no earlier than one week before the commencement of site clearance works. This is to avoid the recolonization of other *S. zanklon* individuals in the concerned watercourse(s) after the capture survey. Site clearance works at the concerned watercourses(s) commenced last 27 July 2022 (upstream section) and 30 July 2022 (downstream section).

2.4.1.2 The capture-translocation activities were conducted during wet season when the crabs are more active (Black & Veatch, 2020). Where possible, the activities were conducted at time with lower surface water, i.e. avoiding period of heavy rainfall and/ or during period of lower rainfall. The lower surface water in watercourse allowed surveyors to maximise the survey extent for the translocation survey. Each translocation survey was conducted in both day time and night time during the capture-translocation period.

2.4.1.3 Standard survey methodology for aquatic fauna, including active searching by hand netting and kick sampling was adopted to search for the presence of *S. zanklon*. In addition, direct observation was also conducted along the stream riparian zone, where potential hiding space (e.g. under rocks and fallen tree branches) will also be checked to search for *S. zanklon*. Permit under Cap. 170 was obtained from AFCD before the use of nets to collect freshwater fauna in the streams (**Appendix C**).

2.4.1.4 All *S. zanklon* individuals caught during the capture-translocation activities were recorded and photographed on site. The surveyor recorded the individual's size (see **Photo 2.1**), sex (see **Photo 2.2**) and any other observation such as injuries. The capture-translocation activities were conducted for at least three times until new individuals of *S. zanklon* are not discovered within the watercourse sections of collection.

Photo 2.1: Size measurement of the captured *Somanniathelphusa zanklon* individual

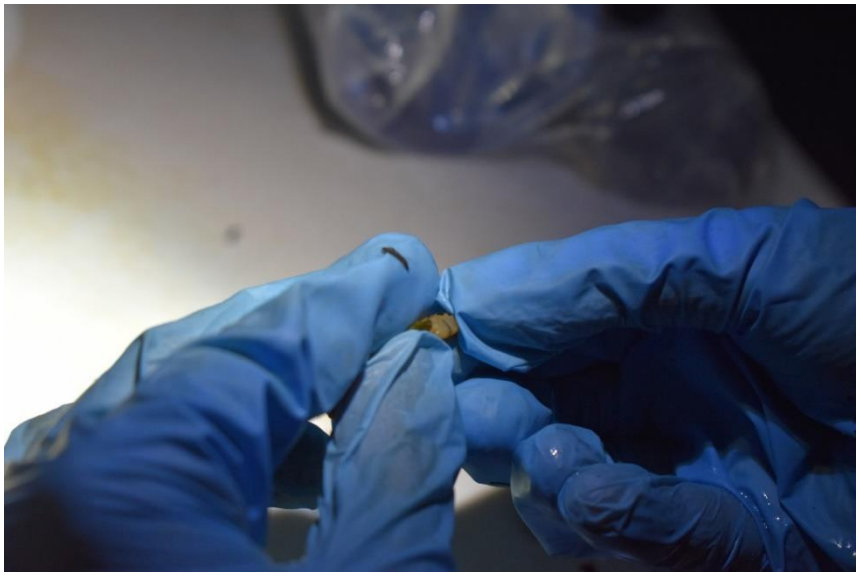


Photo 2.2: Sex determination of the captured *Somanniathelphusa zanklon* individual

2.4.2 Hand Netting

2.4.2.1 Hand netting (see **Photo 2.3**) was used as a quick search at potential habitats along the watercourse. As most aquatic species spend majority of their time amongst vegetation, leaf litter or on the bottom of water body, hand netting was aimed in these areas. The sweeping motion of the hand netting scraped the layer of the stream bottom substrate into the net, e.g. soil and leaf litter where possible, as *S. zanklon* is likely to be among these substrates.

Photo 2.3: Hand netting at a potential habitat (vegetation) along the watercourse

2.4.2.2 After taking the hand net out of the water, it was allowed to drain, and the net content was emptied on to a large sorting tray (see **Photo 2.4**). All caught *S. zanklon* were carefully moved to a plastic container (see **Photo 2.5**) for translocation.

Photo 2.4: Large sorting tray with net contents

Photo 2.5: Plastic container for translocation

2.4.3 Kick-netting

2.4.3.1 Kick-netting (see **Photo 2.6**) was done along the watercourse by moving upstream with the net facing the water current. The surveyor disturbed the substrate by kicking the streambed substrate by kicking, such that the *S. zanklon* dislodged from the streambed was trapped in the net. In order to maximise the survey effort within the stream, the surveyor moved up the stream in a zigzag direction to increase the kick sampling coverage. The net was checked after a maximum of one minute of kick sampling. However, the net was checked more frequently if large amount of substrate was kicked into the net.

Photo 2.6: Surveyor kick-netting the substrate and checking the net's contents

2.4.3.2 Similar to hand netting, the net content was emptied on to a large sorting tray. All caught *S. zanklon* were carefully moved to a plastic container for translocation.

2.4.4 Marking

2.4.4.1 Captured *S. zanklon* individuals were marked (see **Photo 2.7)** first prior to translocation to the recipient site. The marker was an epoxy-resin based paint (Jotamastic Wintergrade) which contains a metallic component and cures in contact with water. Earlier laboratory and field trials had established that crab survival and behaviour was unaffected by paint marking on the carapace and that the marks persisted in field conditions (Eaton et. al., 2001).

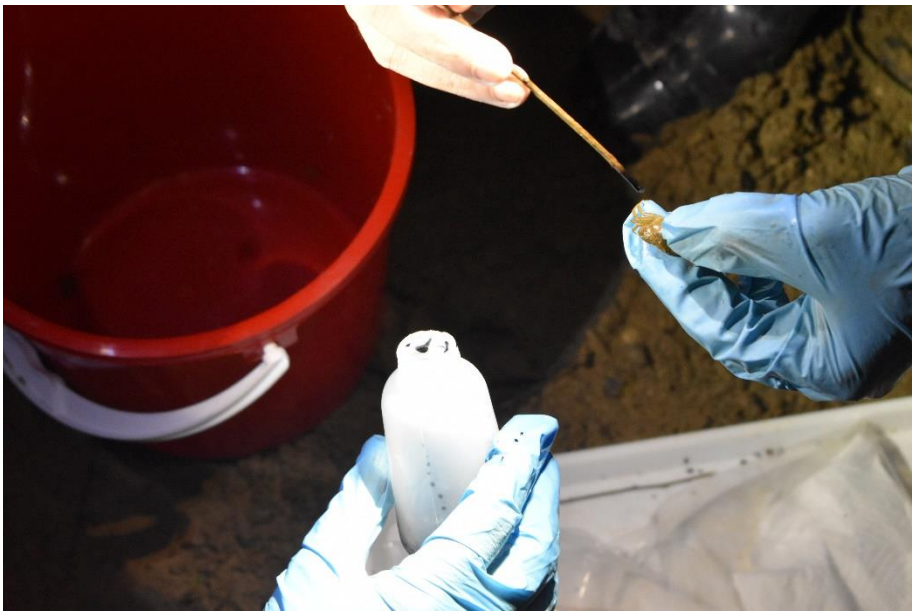


Photo 2.7: Surveyor marking the carapace of the captured *Somanniathelphusa zanklon* individual

2.5 Translocation Activities

2.5.1 Background of the Recipient Site

2.5.1.1 The recipient site is located at the middle section of Ping Yuen River tributary, and adjacent to Ping Yuen Road, to the north of Ping Yeung Village (see **Photo 2.8**). In this tributary, *S. zanklon* was previously recorded during the approved EIA studies (i.e. EIA-133/2007 and EIA-190/2010) (ERM, 2022) suggesting that this watercourse is suitable for *S. zanklon*.

Photo 2.8: Recipient site located at the middle section of Ping Yuen River tributary, and adjacent to Ping Yuen Road (outside NENTX)

2.5.1.2 While channelisation features (e.g. concrete bank and gabions) and an inflatable water dam are present about 100m to the east of this middle stream section, this section is considered largely natural with a low gradient and low water flow. The streambed is mainly covered by soil and stream banks are vegetated with grass. This section is generally considered as a suitable recipient site for the crab considering the stream characteristics, which meet the habitat requirements of the species. The soft soil stream substrate and the availability of riparian vegetation would be ideal for *S. zanklon* to create microhabitat to inhabit. In addition, the natural meander would also reduce the water flow, which is preferred by the *S. zanklon*. As revealed by up-to-date satellite images, similar habitat is present over a long distance as the stream stretches west toward Ping Che Road. It is anticipated that pollution or disturbance would be in a low level in this section, considering there is limited roads and houses (and therefore human activities) until the stream reaches Kan Tau Wai and Tong Fong along Ping Che Road. It is considered that there is approximately 1.2km of relatively undisturbed habitat for the *S. zanklon*.

2.5.1.3 The recipient site was resurveyed again to re-confirm its suitability prior to the start of translocation survey.

2.5.2 Translocation to Recipient Site

2.5.2.1 During the translocation activities, all caught *S. zanklon* at the collection sites were moved to a plastic container for translocation. The plastic container was filled with water from the watercourse where *S. zanklon* was caught. The plastic container was placed with small amount of leaf litter to provide temporary habitat for the caught individuals. In order to avoid stress and mortality, all *S. zanklon* individuals were translocated to the identified recipient site within four hours after being caught.

2.5.2.2 Upon arrival to the recipient site, the surveyor gradually mixed the water at recipient site into the plastic container before releasing all individuals to the recipient site (see **Photo 2.9**). This acclimatisation process would lower the risk of mortality due to temperature shock on the translocated individuals. It was noted that any deceased individuals would not be released into the recipient site, but it would be reported.

Photo 2.9: Recipient site during the actual translocation activity located at the middle section of Ping Yuen River tributary, and adjacent to Ping Yuen Road (outside NENTX)

3. Survey Results

3.1 Abundance

3.1.1 A total of eight *S. zanklon* individuals (**Appendix D**) were captured, marked, and translocated during the survey from 21-24 July 2022. All these individuals were captured from the watercourse section adjacent to the truck water filling station within the Survey Area, particularly from the soft silty-muddy substrate with adjacent riparian vegetation of the water section. No other individual was present nor captured from other collection sites. Additionally, no other aquatic fauna of conservation importance was noted within the Survey Area.

3.1.2 All the individuals were collected on 21 July 2022. Succeeding this collection date, no individuals of *S. zanklon* were collected for the next three consecutive capture surveys.

3.2 Size

3.2.1 Sizes of the eight *S. zanklon* individuals ranged from 0.36 cm to 1.36 cm. Majority of the individuals were below 1 cm in carapace width which indicated that these individuals were still juveniles relative to the sizes of several recorded individuals which range from 3.04 cm to 4.2 cm (Huang et. al, 2018).

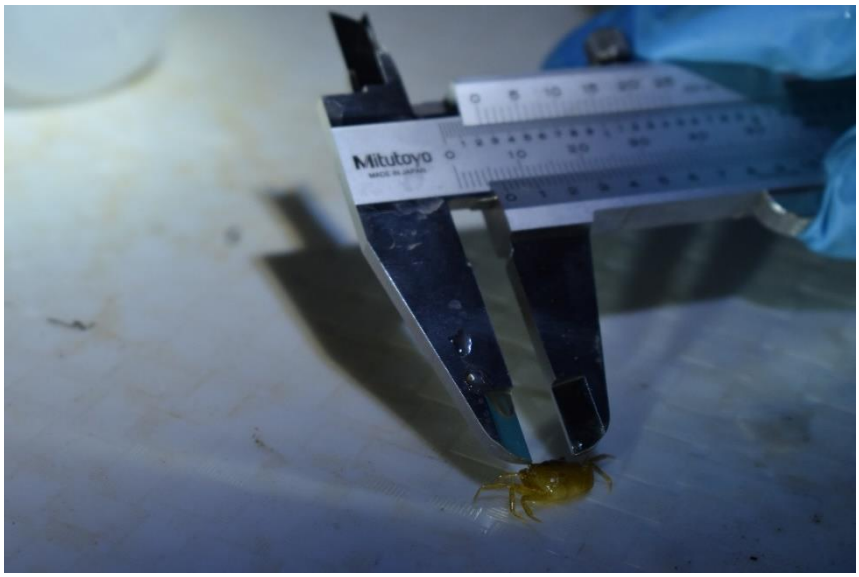


Photo 3.1: Size of one captured *Somanniathelphusa zanklon* individual

3.3 Sex

3.3.1 Majority of the captured *S. zanklon* individuals were males (7 individuals) while there was only one recorded female in the area. Current survey findings that showed sex ratio as skewed towards males were similar with observations by Huang et. al (2018) which noted the dominance of males within the community.

Photo 3.2: Captured male *Somanniathelphusa zanklon* individual showing its abdominal segments

4. Summary and Conclusions

4.1.1 A total of eight *S. zanklon* individuals were captured, marked and translocated throughout the survey period from 21-24 July 2022. These individuals were translocated to the recipient site specified on the approved Revised Translocation Proposal for the Endemic Freshwater Crab *S. zanklon*. Further, these individuals were all juveniles relative to their sizes; and male crabs dominated the community within the Survey Area.

4.1.2 No other aquatic fauna of conservation importance was noted within the Survey Area throughout the survey period.

5. Post-translocation Monitoring

5.1.1 As required in FEP condition 2.8 and the EIA Report Approval Condition No. 4, monitoring of the endemic freshwater crab *S. zanklon* will be carried out according to the submission approved under FEP condition 2.6.

5.1.2 Particularly, the EIA Report Approval Condition No.4 requires post-translocation monitoring activities to monitor the establishment and effectiveness of the measures given to the endemic *S. zanklon* community in the translocated site.

5.1.3 The post-translocation monitoring will be conducted by qualified ecologists using the mark-recapture method. Mark-recapture method is a tool for conservation measures where animals are marked and detected later by capture or sighting. The method can used to estimate population size and survival rates (Lettink and Armstrong 2003) of the translocated *S. zanklon* individuals in the recipient site. Recaptures shall be re-marked with black numerals to indicate the month of capture. In this way, it will also be possible to construct a complete capture history for each marked individual (Bell et. al., 2003). All recaptures shall be re-released.

5.1.4 For the monitoring frequency, the post-translocation monitoring will be conducted once a month (at night-time) for the first 3 months after the translocation activities, and then will be done quarterly after the third month for one year. This is to ensure that only minimal disturbance will be created to the newly establishing translocated *S. zanklon* community in the recipient site.

5.1.5 Hand netting and kick sampling on the recipient site will be conducted during the monitoring activities. Information as included in datasheet at **Table 5.1** will also be collected.

Table 5.1: Data sheet for *Somanniathelphusa zanklon* post-translocation monitoring

Information		Description	
Date:		Capture Site1:	
Weather:		Capture Site2:	
Start Time:		Capture Site3:	
Finish Time:		Recipient Site:	
Remarks:			
Qualified Ecologists:			

Individual Number	**Abundance**	**Size (Carapace width, cm)**	**Sex (M/F)**	**Remarks**

6. References

Bell, M.C., D.R. Eaton, R.C.A. Bannister, J.T. Addison. 2003. A mark-recapture approach to estimating population density from continuous trapping data: application to edible crabs, *Cancer pagurus*, on the east coast of England. Fisheries Research (65):361–378.

Black & Veatch. 2020. Approved Environmental Monitoring and Audit Manual 198172/B&V/034 for the Development at San Hing Road and Hong Po Road, Tuen Mun accessed at https://www.epd.gov.hk/eia/register/report/eiareport/eia_2632020/EM&A/02%20PDF/EMA_2.pdf

Eaton, D.R., J.T. Addison, S.P. Milligan, J. Brown and L.J. Fernand. 2001. Larvae surveys of edible crab (*Cancer pagurus*) off the east coast of England: implications for stock structure and management. ICES CM 2001/J:14. 10pp.

Huang, C., K.C. Wong, S.T. Ahyong. 2018. The freshwater crabs of Macau, with the description of a new species of *Nanhaipotamon* Bott, 1968 and the redescription of *Nanhaipotamon wupingense* Cheng, Yang, Zhong & Li, 2003 (Crustacea, Decapoda, Potamidae). ZooKeys 810: 91–111. https://doi.org/10.3897/zookeys.810.30726.

Lettink, M. and D.P. Armstrong. 2003. An introduction to using mark-recapture analysis for monitoring threatened species. Pp. 5-32 in: Department of Conservation 2003: Using mark-recapture analysis for monitoring threatened species: introduction and case study. Department of Conservation Technical Series 28, 63 p.

Appendix A

Survey Area

A.1 Map of the Survey Area (within NENTX) for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

N

WONG KE SHAN ROAD

SHEK TSAI HA ROAD

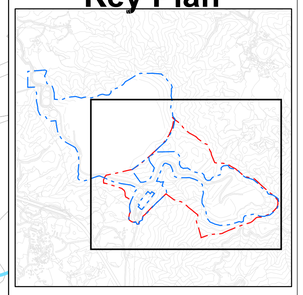
NORTH EAST NEW TERRITORIES LANDFILL

WONG KE SHAN

Legend

- Collection Sites
- Existing NENT Landfill
- NENT Landfill Extension (NENTX)
- Hydrographic features

Key Plan



No.	Date	Description	Designed	Checked
		Name	Date	
Drawn		SMR	02 AUG 2022	
Checked		FMN	02 AUG 2022	

Project No.: 0092-22

Project Title: **NORTHEAST NEW TERRITORIES LANDFILL EXTENSION (NENTX)**

Figure title: Collection Sites (within NENTX) for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

Drawing No.: 0092-22/001

Revision:

Scale: 0 15 30 60 Meters

Client: VEOLIA ENVIRONMENTAL SERVICES HONG KONG LTD.

Environmental Team: AURECON HONG KONG LTD.

Sub-consultant: FUGRO TECHNICAL SERVICES LIMITED

A.2 Photos of the Collection Sites (July 2022)

A.2.1: Watercourse Section adjacent to the truck water filling station within the Survey Area (NENTX)

A.2.2: Watercourse Section adjacent to the truck water filling station within the Survey Area (NENTX)

A.2.3: Watercourse Section along the Shek Shui Ancient Path, within the Survey Area (NENTX)

A.2.4: Watercourse Section along the Shek Shui Ancient Path, within the Survey Area (NENTX)

A.2.5: Ditch in the approved EIA study

A.2.6: Ditch in the approved EIA study and its upstream section

Appendix B

Recipient Site

B.1 Map of the Recipient Site (outside NENTX) for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

N

HA HEUNG YUEN

KONG YIU

NORTH EAST NEW TERRITORIES LANDFILL

TUNG LO HANG

NGONG TONG

NGA YIU HA

LUNG MEI TENG

WO KENG SHAN ROAD

SHEK TSAI HA ROAD

SHEK TSAI HA

NORTH EAST NEW TERRITORIES LANDFILL

HEUNG YUEN WAI HIGHWAY

Ping Yuen River

PING CHE ROAD

TA KWU LING

SHUI NGAU TSO

PING YEUN ROAD

Ping Yeng

WO KENG SHAN

HEUNG YUEN WAI HIGHWAY

WO KENG SHAN ROAD

PING CHE ROAD

Legend

- Recipient Site
- NENT Landfill Extension (NENTX)
- Existing NENT Landfill
- Hydrographic features

No.	Date	Description	Designed	Checked
		Name	Date	
Drawn		SMR	02 AUG 2022	
Checked		FMN	02 AUG 2022	

Project No.
0092-22

Project Title
NORTHEAST NEW TERRITORIES LANDFILL EXTENSION (NENTX)

Figure title
Recipient Site (outside NENTX) for the Endemic Freshwater Crab *Somanniathelphusa zanklon*

Drawing No.
0092-22/002

Revision

Scale
0 30 60 120
Meters

Client
VEOLIA
VEOLIA ENVIRONMENTAL SERVICES HONG KONG LTD.

Environmental Team
aurecon
AURECON HONG KONG LTD.

Sub-consultant
FUGRO
FUGRO TECHNICAL SERVICES LIMITED

Appendix C

Obtained Permit under Cap. 170

C.1 Permit obtained from AFCD under Cap. 170

漁農自然護理署
九龍長沙灣道三０三號
長沙灣政府合署五樓

覆函請寄交
「漁農自然護理署署長」
Please address all replies to
Director of Agriculture, Fisheries and Conservation

AGRICULTURE, FISHERIES AND CONSERVATION DEPARTMENT
Cheung Sha Wan Government Offices
5th floor, 303 Cheung Sha Wan Road
Kowloon, Hong Kong

本署檔號 Our Ref. : (96) in AF GR CON 09/51 Pt.8
來函檔號 Your Ref. :
電　　話 Tel. No. : / For enquiries: 2150 6921
電郵地址 E-mail Address : mailbox@afcd.gov.hk
圖文傳真 Faxline No. : (852) 2311 3731

14 July 2022

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

I hereby give permission to:

LI, Kwok Shing Ray; BOREGON, Kalvin Jay; TAM, Chun Yiu Jacky; TILLO, Jhomar Tillo; RABI, Sheila Marie and NABUAB, Fenelyn of Fugro Technical Services 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 October 2022**.

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

Fenelyn NABUAB
Fugro Technical Services Limited
13/F, Fugro House – KCC2,
1 Kwai On Road,
Kwai Chung, N.T.
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 LI, Kwok Shing Ray; BOREGON, Kalvin Jay; TAM, Chun Yiu Jacky; TILLO, Jhomar Tillo; RABI, Sheila Marie and NABUAB, Fenelyn of Fugro Technical Services Limited to capture freshwater macro-invertebrates for surveys and translocation at Ta Kwu Ling under the project "North East New Territories Landfill Extension" (Contract No. EP/SP/77/15) as proposed to this department on 12 and 13 July 2022.
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 produce a copy of this permit for inspection on demand by any officer of this Department or police officer.
7. The permit holders shall provide a report on the location, quantity and species of specimens surveyed to this Department upon request.
8. The Director of Agriculture, Fisheries and Conservation reserves the right to recall or cancel this permission at any time.

* End of Conditions *

July 2022
Agriculture, Fisheries and Conservation Department

漁農自然護理署
長沙灣道 303 號
長沙灣政府合署 7 樓

AGRICULTURE, FISHERIES AND CONSERVATION DEPARTMENT
Cheung Sha Wan Government Offices
303 Cheung Sha Wan Road, 7th Floor
Kowloon, Hong Kong.

By registered mail

本處檔號 OUR REF.: (4) in AF GR CON 09/50 pt. 38
來函檔號 YOUR REF.:
電　　話 TEL NO.: 2150 6921
電郵地址 E-mail Address: tony_kt_chan@afcd.gov.hk
圖文傳真 Faxline No.: 2377 4427

14 July 2022

Fenelyn Nabuab
Fugro Technical Services Limited,
13/F, Fugro House – KCC2,
1 Kwai On Road,
Kwai Chung, NT, Hong Kong

Dear Fenelyn Nabuab,

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

Thank you for your emails of 12 and 13 July 2022.

I enclose a permit for your retention. You are requested to observe the conditions of the permit. Please contact the undersigned should you have any queries.

Yours sincerely,

(K. T. CHAN)
for Director of Agriculture, Fisheries and Conservation

Encl.

Appendix D

Collected *Somanniathelphusa zanklon* individuals and Fieldwork Datasheet

D.1 Photos of Collected *Somanniathelphusa zanklon* individuals

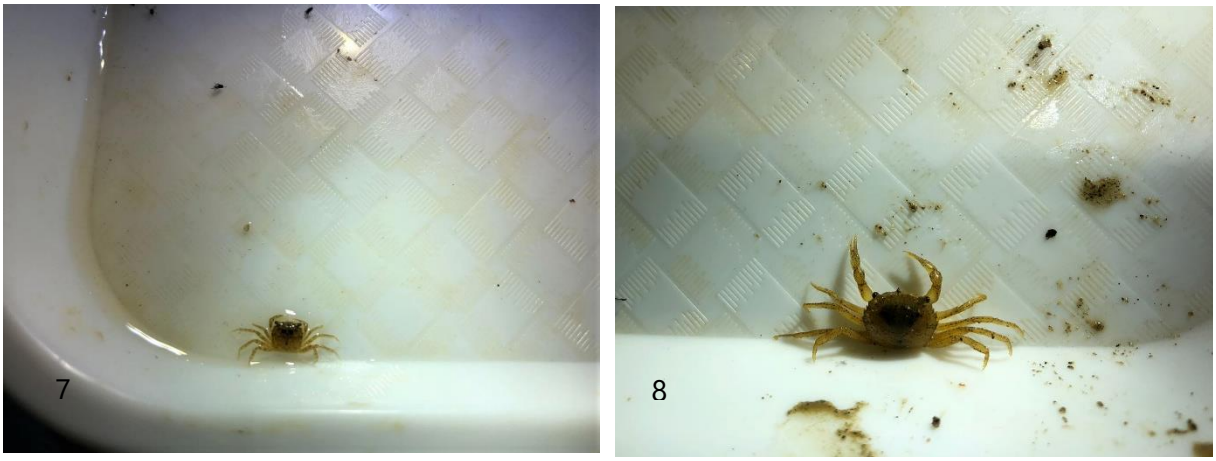


Figure D.1: Photos of eight *Somanniathelphusa zanklon* individuals

D.2 Fieldwork Datasheet

Northeast New Territories Landfill Extension (NENTX) Capture-Translocation Survey

Information		Description	
Date:	21 July 2022	Capture Site1:	— Upstream; slow flowing; turbid water column; silty to sandy substrate; low water level; shaded; grasses, ferns, trees, and shrubs at the riparian area
Weather:	Sunny / Fine	Capture Site2:	— Downstream; low gradient; slow flowing; turbid water column; silty to sandy substrate; low water level; partly shaded; grasses, ferns, trees, shrubs at the riparian area
Start Time:	1700	Capture Site3:	— Upstream; slow flowing; moderately clear, clayey to rocky substrate; low water levels, shaded; grasses, ferns, trees, shrubs, climbers at the riparian area
Finish Time:	2200	Recipient Site:	— Downstream; low gradient; slow flowing; turbid water column; silty to sandy substrate; grasses, ferns, shrubs, & climbers at the riparian area
Remarks:			
Qualified Ecologists:			
	Kalvin Jay Borgon	Ray Li	
	Thomer Tillo		

Individual Number	Abundance	Size (Carapace width, cm)	Sex		Remarks (Capture Site)
			M	F	
1	1	0.99	✓		—
2	1	0.68	✓		—
3	1	0.80		✓	—
4	1	1.36	✓		—
5	1	0.36	✓		—
6	1	0.67	✓		—
7	1	0.40	✓		—
8	1	0.90	✓		—