



FUGRO

10th Post-transplantation Monitoring and Audit Report (12th May 2023)

Northeast New Territories Landfill Extension (NENTX) | Contract No. EP/SP/77/15

0092/22/ED/0372 02 | 15 May 2023

Formal Submission

Veolia Environmental Services Hong Kong Limited



Our Ref.: CL/91823/0449-VES
Date: 1 June 2023

By Email

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

Attn.: Mr. Colin Mitchell

**Meinhardt Infrastructure and
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邁進基建環保工程顧問有限公司

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Dear Sir

Re: Contract No. EP/SP/77/15
North-East New Territories Landfill Extension (NENTX)
10th Post-Transplantation Monitoring Report (12 May 2023)

I refer to Conditions 2.7 and 2.9 under Environmental Permit No. EP-292/2007 and Conditions 2.5 and 2.7 of Further Environmental Permit No. FEP-01/292/2007, regarding the submission of Post-Transplantation Monitoring Report. I hereby verify the captioned "10th Post-Transplantation Monitoring Report (12 May 2023)" dated 15 May 2023.

Should you have any queries, please do not hesitate to contact the undersigned at 2859 5409.

Yours faithfully
MEINHARDT INFRASTRUCTURE AND ENVIRONMENT LTD



Claudine Lee
Independent Environmental Checker

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The Aurecon logo consists of a small green square above the word "aurecon" in a bold, lowercase, sans-serif font.

Ref: P521530-0000-REV-NN-0055

31 May 2023

By Email

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 10th Post-Transplantation Monitoring Report (12 May 2023)

In accordance with the requirement specified in Conditions 2.7 and 2.9 of Environmental Permit No. EP-292/2007 and Conditions 2.5 and 2.7 of Further Environmental Permit No. FEP-01/292/2007, we are pleased to submit the certified "10th Post-Transplantation Monitoring Report (12 May 2023)" dated on 15 May 2023 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

A handwritten signature in blue ink, appearing to read "Fredrick Leong".

Fredrick Leong
Environmental Team Leader

Encl.

1. 10th Post-Transplantation Monitoring Report (12 May 2023)

cc.

1. IEC - Ms. Claudine Lee (By email: claudinelee@meinhardt.com.hk)
2. IEC Representative – Ms. Echo Hung (By email: echohung@meinhardt.com.hk)

Document Control

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1. INTRODUCTION

1.1 Background of the Project

- 1.1.1 The North East New Territories Landfill Extension (the NENTX Project) is a designated project. The Environmental Impact Assessment (EIA) Report was approved (AEIAR-111/2007) with conditions on 20 September 2007 and the Environmental Permit (EP) EP-292/2007 (the "EP") was issued on 26 November 2007. Moreover, a Further Environmental Permit FEP-01/292/2007 (the "FEP") was also issued under the EIA Ordinance on 28 April 2022.
- 1.1.2 The transplantation works were conducted in fulfilment of Conditions 2.7 and 2.9 of the EP and Conditions 2.5 and 2.7 of the FEP and in accordance with the approved Transplantation Proposal for Plant Species of Conservation Importance (Rev.1) (NENTX-FUG-RP-E-EM-002-I02) (the "approved Proposal"). The Transplantation Report (NENTX-AURE-RP-ZZ-E-007-I-I01) was prepared by a qualified ecologist certified by the Environmental Team (ET) Leader and Independent Environmental Checker (IEC) in accordance with Condition 2.7 of the EP and Condition 2.5 of the FEP.
- 1.1.3 The Transplantation Report details the methodology of the transplantation activities. The actual transplantation works for the plant species of conservation importance was described along with the post-transplantation maintenance. The post-transplantation monitoring and audit and the implementation programme was also detailed. The vegetation survey which investigated the plant species of conservation importance before the transplantation work was detailed in the approved Transplantation Proposal.
- 1.1.4 Before the transplantation activities, a detailed vegetation survey was conducted by direct observation to record the plant species of conservation importance present in NENTX. A total of four floral species of conservation importance were identified within the Project Site, namely Incense Tree *Aquilaria sinensis*, Endospermum *Endospermum chinense*, Lamb of Tartary *Cibotium barometz* and Bottlebrush Orchid *Goodyera procera*. Individuals that were directly impacted by the proposed construction of NENTX Landfill had been selected for transplantation. More details to be found in the approved Transplantation Proposal.
- 1.1.5 Based on the findings of the detailed vegetation survey and verification survey, three plant species of conservation importance were considered suitable for transplantation, i.e., two nos. of Incense Tree saplings, one cluster of Lamb of Tartary, and 19 clusters of Bottlebrush Orchid. The transplantation works was carried out by a landscape contractor and supervised by a qualified ecologist. The qualified ecologist has at least five years of relevant experience in transplantation and/or vegetation survey and assessment and is also an ISA Certified Arborist.

- 1.1.6 The three plant species of conservation importance were transplanted to suitable receptor sites. To further safeguard these species, the selected receptor sites were within or adjacent to the facilities managed by the Contractor. Moreover, the similarity in site conditions between the collection site and receptor site and the accessibility of the receptor for future maintenance and monitoring were also considered in the selection. More details to be found in the Transplantation Report.
- 1.1.7 All the transplanted individuals will be maintained by the Contractor for 12 months (establishment period) after planting to the receptor sites in accordance with Section 4 of the approved Proposal. Moreover, their survival and growth will be monitored by a qualified ecologist or botanist of Fugro in accordance with Section 5 of the approved Proposal.

1.2 Purpose of this Document

- 1.2.1 This 10th Post-transplantation Monitoring Report (the "Report") was prepared to present the survival and growth of plant species of conservation importance after transplantation works. Moreover, key maintenance activities conducted this reporting month and recommendations on post-transplantation maintenance are presented in this Report.
- 1.2.2 The post-transplantation monitoring and audit of the transplanted plant species of conservation importance was carried out in accordance with Section 5 of the approved Transplantation Proposal.

1.3 Structure of this Document

Succeeding this introductory section, the remainder of this Report is presented as follows:

- Section 2 details the monitoring results, including the key maintenance activities conducted this reporting month;
- Section 3 presents the succeeding post-transplantation monitoring schedule; and
- Section 4 summarizes the findings of the post-transplantation monitoring and way forward.

2. MONITORING RESULTS

Following the transplantation works on 10 November 2022, the 10th post-transplantation monitoring and audit was carried out on 12 May 2023 to check the condition of the transplanted plant individuals.

2.1 Condition of the Transplanted Individuals

- 2.1.1 The transplanted individuals of the 19 clusters of Bottlebrush Orchid *Goodyera procera* were all in fair to good condition with minor health issues observed in some individuals, i.e., slightly chlorotic leaves and presences of holes in the leaves. Moreover, most individuals have passed the flowering stage.
- 2.1.2 The Lamb of Tartary *Cibotium barometz* is now in good condition. The old foliage has wilted but new foliage has started growing from the roots. Comparing to the last monitoring, the new foliage is a lot more established and have been growing steadily.
- 2.1.3 The two saplings of the Incense Tree *Aquilaria sinensis* also both demonstrated poor health conditions with die back and fallen leaves.
- 2.1.4 Albeit strict compliance of the transplantation works and post-transplantation maintenance to the approved Transplantation Proposal, transplanted individuals would require time to adapt and establish in the new environment/substrate of the receptor site. Hence, signs of leaf discoloration and/or wilting, dehydration, and even die-off are expected. Thus, succeeding post-transplantation maintenance and monitoring and audit are crucial to assess the progress of recovery and establishment of transplanted individuals in the receptor site.
- 2.1.5 The numbers, measurements, and health conditions of the transplanted plant species of conservation importance during the current monitoring period are shown in **Appendix A**.
- 2.1.6 The photographic records of the transplanted plant species of conservation importance during the current monitoring period are shown in **Appendix B**.

2.2 Key Maintenance Activities Conducted in The Reporting Month

- 2.2.1 The key maintenance activities carried out for the current reporting month are the following:
- Watering frequency of the two Incense Tree saplings was 2-3 times per week. The watering dates were 24 Apr, 26 Apr, 28 Apr, 1 May, 3 May, 5 May, 8 May, 10 May, 12 May.
 - The watering frequency of the cluster of Lamb of Tartary was 2 times a week. The watering dates 24 Apr, 28 Apr, 1 May, 5 May, 8 May, 12 May.
 - Once a week watering of Bottlebrush Orchid. The watering dates were 24 Apr, 1 May, 8 May.
 - Manual removal of weeds when observed during watering activities; and
 - Checking of insect attacks and/or fungal infestation during watering activities.
 - Pruning of wilted foliage of the cluster of Lamb of Tartary.

- Reinforcing fence of the two Incense Tree saplings.

2.3 Recommendation on Post-Transplantation Maintenance

Immediately after the monitoring and audit activity, the following post-transplantation maintenance was discussed with the Contractor for their prompt implementation:

- The watering frequency for the two saplings of Incense Tree should be maintained at 2-3 times a week. Improve/place organic mulch around the two saplings of Incense Tree to retain soil moisture, protect damaged roots against extreme temperatures, and improve soil quality.
- The watering frequency of the cluster of Lamb of Tartary should be maintained at twice a week. Wilted leaves and stems should be pruned away.
- The watering frequency for all 19 clusters of Bottlebrush Orchid should remain the same. During watering activities, the surrounding dead branches and dry leaves should be removed to ensure no plants are damaged by them.
- Weed around the two Incense Tree saplings should be removed.

3. POST-TRANSPLANTATION MONITORING SCHEDULE

- 3.1.1 As per Section 10.3 and Table 10.1 of the EM&A Manual, the survival and growth of the transplanted species will be monitored by a qualified ecologist or botanist at least twice a month during the first three months after transplantation and once a month in the following nine months.
- 3.1.2 As the monitoring had been conducted twice a month in December, January, and February, the forthcoming monitoring and audit activities will be conducted monthly until October 2023.
- 3.1.3 The need for any further monitoring will be reviewed and determined according to the monitoring results of the 12-month monitoring.

4. SUMMARY AND CONCLUSION

- 4.1.1 The health of the transplanted individuals of Bottlebrush Orchid were all in fair to good condition. The minor deficiencies on some individuals did not have a large impact on their health. Moreover, most of the individuals are passed the flowering stage and the flowers have wilted. The two individuals of Incense Tree saplings were both in poor health condition. The individuals had dieback and fallen leaves. This could be due to transplantation shock brought about by the changes in the environment and the individual has not acclimated to these changes yet. Lastly, the transplanted cluster of Lamb of Tartary is now in good health condition. Its old foliage has wilted, but new sprouts have developed from the roots of the cluster. The new foliage is growing steadily and are becoming more established. As aforementioned, it takes time for newly transplanted plants to grow accustomed to the new environment of the recipient site. Therefore, signs of leaf discoloration and/or wilting, dehydration, and even die-off are expected.
- 4.1.2 It is recommended to pay additional attention to the health conditions of the Lamb of Tartary cluster and the Incense Tree saplings. Moreover, should there be drastic change in the health conditions of these individuals observed during post-transplantation maintenance activities, the Contractor is advised to immediately advise the ecologist to discuss possible remedial actions.

Appendix A

Conditions of Transplanted Plant
Species of Conservation
Importance

12/5/2023

Post-Transplantation Monitoring
Conditions of Transplanted Plants at Receptor Sites

Date of Submission: _____

P. of
Surveyor: Andy Yuen, Sheila Rabi

Date of Monitoring and Maintenance	Receptor Site	No.	Species	Plant Size Measurements			Amenity Value (High/ Medium/ Low)	Form (Good/ Fair/ Poor)	Health Condition (Good/ Fair/ Poor)	Structural Condition (Good/ Fair/ Poor)	Recommendation on Post-Transplantation Maintenance	Key Maintenance Activities Conducted	Remark
				DBH (mm)	Crown Spread (m)	Height (m) cm							
12/5/2023	A	AS02	A. sinensis			115			poor				no foliage
12/5/2023	A	AS03	A. sinensis			175			poor				no foliage
12/5/2023	B	GP01	C. barometz			35			good				new sideheads growing
12/5/2023	B	GP01	C. procera			29			good				flowers withered
12/5/2023	B	GP02	C. procera			13			good				no flowers
12/5/2023	B	GP03	C. procera			14			fair				partially withered leaves
12/5/2023	B	GP04	C. procera			42			fair				partially withered leaves
12/5/2023	B	GP05	C. procera			36			fair				chlorotic leaves
12/5/2023	B	GP06	C. procera			35			fair				flowers withered
12/5/2023	B	GP07	C. procera			13			fair				chlorotic leaves
12/5/2023	B	GP08	C. procera			14			fair				partially chlorotic leaves
12/5/2023	B	GP09	C. procera			28			good				flowers withered
12/5/2023	B	GP10	C. procera			28			fair				flowers withered
12/5/2023	B	GP11	C. procera			31			fair				flowers withered
12/5/2023	B	GP12	C. procera			12			fair				flowers withered
12/5/2023	B	GP13	C. procera			19			fair				flowers withered
12/5/2023	B	GP14	C. procera			39			fair				flowers withered
12/5/2023	B	GP15	C. procera			30			fair				flowers withered
12/5/2023	B	GP16	C. procera			20			good				flowers withered
12/5/2023	B	GP17	C. procera			13			fair				partially withered leaves
12/5/2023	B	GP18	C. procera			23			fair				flowers withered
12/5/2023	B	GP19	C. procera			47			fair				flowers withered

Note:
1. Measurements of spread and DBH are not applicable for undersized tree, shrubs, herbs and ferns.

Appendix B

Photographic Records of
Transplanted Plant Species

B.1 Incense Tree *Aquilaria sinensis*



Photo B.1.1 : General view of the transplanted individual AS-03.



Photo B.1.2 : Stem condition of the transplanted individual AS-03.



Photo B.1.3 : General view of the transplanted individual AS-02.

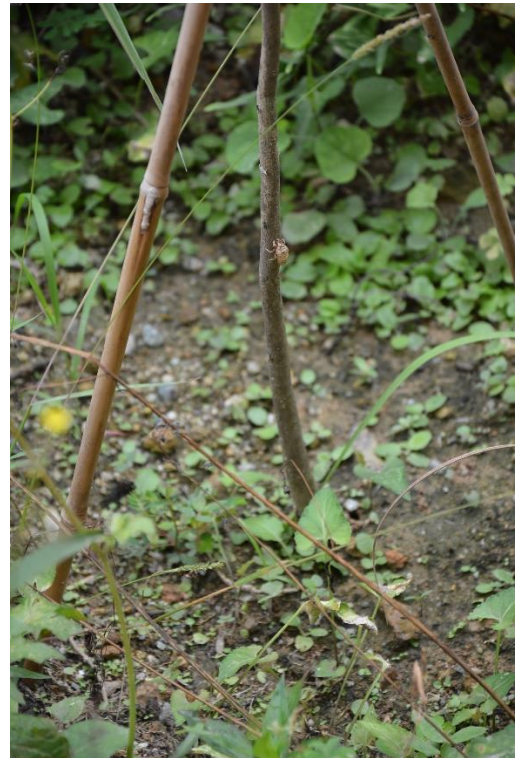


Photo B.1.4 : Stem condition of the transplanted individual AS-02.

B.2 Lamb of Tartary *Cibotium barometz*



Photo B.2.1 : General view of the transplanted individual CB-01.



Photo B.2.2 : New foliage of the transplanted individual CB-01.



Photo B.2.3 : Leaf condition of the new foliage.



Photo B.2.4 : General view of the transplanted individual CB-01.

B.3 Bottlebrush Orchid *Goodyera procera*



Photo B.3.1: Individual GP-01. Flower withering.



Photo B.3.2: Individual GP-02.



Photo B.3.3: Individual GP-03.

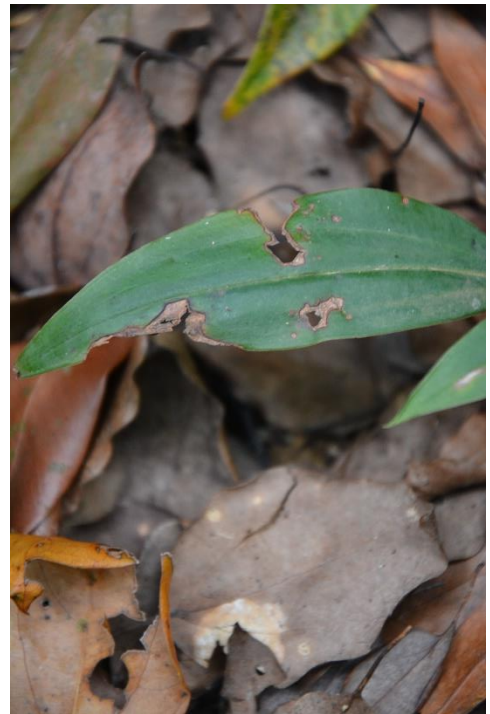


Photo B.3.4: Individual GP-03. Holes in leaves.



Photo B.3.5: Individual GP-04.



Photo B.3.6: Individual GP-04. Wilted flower.



Photo B.3.7: Individual GP-05.



Photo B.3.8: Individual GP-05. Wilted flower.



Photo B.3.9: Individual GP-06.



Photo B.3.10: Individual GP-06. Wilted flower.



Photo B.3.11: Individual GP-07.

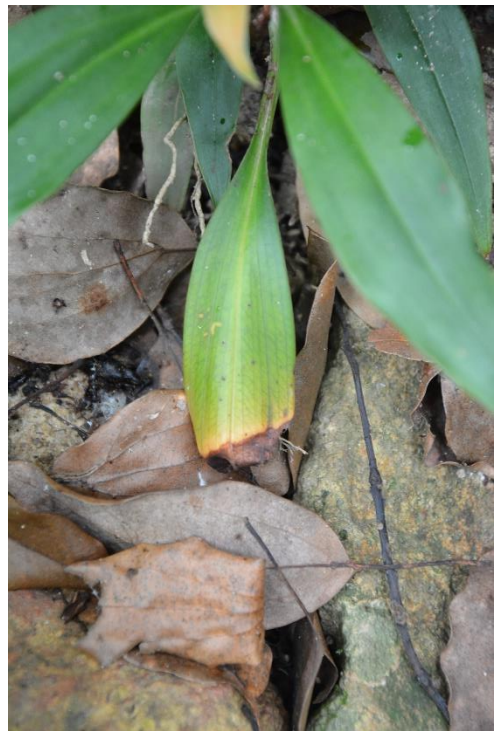


Photo B.3.12: Individual GP-07. Partially wilted leaf.



Photo B.3.13: Individual GP-08.

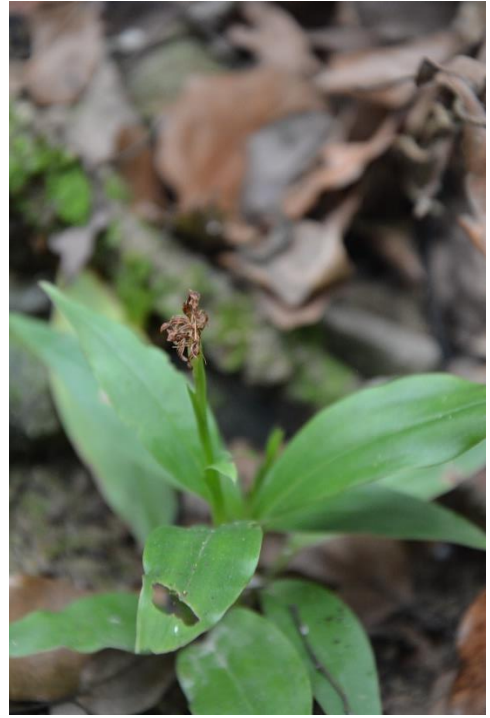


Photo B.3.14: Individual GP-08. Wilted flower.



Photo B.3.15: Individual GP-09. Wilting flower.



Photo B.3.16: Individual GP-10. Wilted flower.



Photo B.3.17: Individual GP-11. Flowering.



Photo B.3.18: Individual GP-11. Wilted flower.



Photo B.3.19: Individual GP-12.



Photo B.3.20: Individual GP-13.



Photo B.3.21: Individual GP-14.



Photo B.3.22: Individual GP-14. Wilted flower.



Photo B.3.23: Individual GP-15.



Photo B.3.24: Individual GP-15. Partially wilted leaves.



Photo B.3.25: Individual GP-16.



Photo B.3.26: Individual GP-16. Wilted flower.



Photo B.3.27: Individual GP-17.



Photo B.3.28: Individual GP-18.



Photo B.3.29: Individual GP-18. Wilted flower.



Photo B.3.30: Individual GP-19. Flowering.



Photo B.3.31: Individual GP-19. Wilted flower.