

For information
On 27 January 2014

**The Legislative Council
Panel on Environmental Affairs**

**Incident of Leachate from North East New Territories Landfill
Progress Report**

Purpose

Members were briefed on the incident of leachate leakage from the North East New Territories (NENT) Landfill and the associated measures taken on 17 September 2013 (CB(1)1774/12-13(01)). This paper updates Members on the progress of the improvement works and the associated measures undertaken by the Administration at the NENT Landfill.

The Cause of the Incident

2. On 27 July 2013, leakage of leachate from a recently commissioned temporary leachate storage lagoon at the NENT Landfill was detected. At the Panel meeting on 17 September 2013, the Administration briefed Members on the details of the incident including findings of our environmental monitoring, the immediate remedial actions taken by the contractor of the NENT Landfill and the Government, as well as various follow-up actions to be taken. Members also visited the NENT Landfill site on 1 September 2013 prior to the meeting on 17 September 2013.

3. The contractor of the NENT Landfill was instructed to submit an incident report which covers the causes of the incident, measures taken on site during the incident period as well as interim and longer term measures to improve the management of leachate on site and prevent the reoccurrence of similar incidents. The incident report was submitted by the landfill contractor on 4 October 2013 for review by the Environmental

Protection Department (EPD) and the independent consultants¹. After detailed examination and assessment of the report, we are of the view that the leakage incident, as detected on 27 July 2013, was triggered by a hole that had punctured through the impermeable liner during the course of filling leachate into the temporary leachate storage lagoon. The punctured hole was believed to be caused by liner material failure, which in turn was either due to material defects or movement of the side slope wall caused by continuous heavy rain a few days before the incident² or a combination of both factors.

4. At present, we are pursuing the liability of the contractor under the NENT Landfill Contract and enforcement actions under the Water Pollution Control Ordinance. We are also putting in place all necessary remedial and preventive measures so as to avoid any reoccurrence of similar leakage incidents in future.

Improvement Measures

5. The following remedial and preventive measures have been or are being implemented by the landfill contractor to avoid any leakage from the temporary leachate storage lagoons, and to allow sufficient storage capacity for the leachate generated during the coming wet season as well as for longer term.

(a) Temporary Leachate Storage Lagoons at NENT Landfill

6. To avoid any reoccurrence of similar incidents in future, the contractor has paid extra attention to safeguard the integrity, stability and

¹ During the full duration of the Contract period, a team of independent consultants (IC) with appropriate professional, engineering and environmental expertise was appointed as an independent third party to be responsible for providing advice, examining the performance and certifying the design and construction (including permanent and temporary works) under the Contract undertaken by the Contractor. This also covers the vetting of environmental monitoring performance and safety matters from the construction and operation stages up to the end of the aftercare period. An IC agreement was signed among EPD, the Landfill Contractor and the IC upon the commencement of the Landfill Contract.

² According to the data recorded by the Hong Kong Observatory, there was a total rainfall of 174mm between 23 and 27 July 2013.

robustness of all temporary leachate storage lagoons at the NENT Landfill. Besides checking the stability and the serviceability of the existing temporary leachate lagoons, the contractor has safeguarded the performance of the temporary leachate storage lagoons by providing double impermeable liners with a layer of bentonite in between for all future temporary leachate storage lagoons. In addition, all the side walls of the lagoons are to be covered with impermeable liners in order to prevent any surface erosion due to rainstorm which will undermine the lagoon stability. All the lagoons are subject to close monitoring to ensure their stability and serviceability, in particular during the wet seasons.

7. In order to prevent rainfall from infiltrating into the waste mass, over 90% of the entire landfill area with the exception of the tipping platforms and access roads were already covered by impermeable liners. Similarly, to prevent rainfall from entering the leachate storage lagoons which would increase the amount of stored leachate, the contractor has taken active actions to retrofit floating covers to the existing temporary storage lagoons wherever practicable and engineering consideration allows. We will also require under the future contract for the proposed NENT Landfill extension that floating covers be provided for all the lagoons, including both temporary leachate storage lagoons and permanent lagoons at the leachate treatment works.

(b) Wastewater Treatment at NENT Landfill

8. We have also advised the contractor to improve the overall leachate management plan. To improve the overall treatment capacity of the wastewater management system at the NENT Landfill, the landfill contractor is now investigating the feasibility of expanding the capacity of the Ammonia Stripping Plant (ASP)³ to increase the quantity of treated leachate that can be discharged to public sewer so as to reduce the on-site temporary leachate storage requirement. It is anticipated that expansion of the ASP will take a year to complete when the feasibility is established and detailed design of the plant is completed.

³ The Ammonia Stripping Plant is used to strip ammonia away from the raw leachate so that the stripped leachate with low ammonia contents can be subsequently treated by the leachate treatment plant to an acceptable discharge standard for pumping to public sewer system.

9. In addition, we have required the contractor to provide on-site package treatment plants with a design capacity of 500 cubic metres per day for treating non-leachate wastewater, including those generated from general site activities and the future full-body vehicle wash facility. This treatment plant is expected to be in place by end of 2014.

10. Furthermore, we have advised the contractor to minimize the number of temporary leachate storage lagoons as far as possible, subject to ensuring adequate storage capacity for leachate generated in the coming wet session. When conditions allow, the contractor would empty and dismantle some lagoons in the near future in order to minimize the amount of rain collected by these lagoons as well as to make way for landfilling operation.

Environmental Monitoring

(a) Kong Yiu Channel

11. We have been monitoring closely the water quality of the Kong Yiu Channel, which is a concrete man-made surface water channel near the NENT Landfill which flows downstream to the Shenzhen River and Deep Bay. We have increased the monitoring frequency from every quarter to a weekly basis. The test results have been uploaded to the EPD website on a weekly basis since 4 October 2013 for public information. We have also enhanced our daily inspection of the channel and no abnormal discharge has been observed. A summary of the test results is at **Annex A**. The latest results of the sample collected on 20 December 2013 indicated full compliance with legal requirements. Since then, no sample could be collected due to the extremely low water level in the Kong Yiu Channel. We will continue to monitor the situation and keep the public informed of the progress.

(b) Shenzhen River and Deep Bay

12. EPD has also been conducting water quality monitoring at the junction of the Kong Yiu Channel and Shenzhen River as well as the downstream stretch of Shenzhen River and Deep Bay. The monitoring results indicate that the leachate overflowed from NENT Landfill as a

result of the leachate leakage incident did not cause any significant impact to the water quality of Shenzhen River and Deep Bay.

Contractual Actions against the Contractor

13. We are taking contractual actions against the contractor for non-compliance of operational and environmental performance as stipulated under the contract in relation to the incident on 27 July 2013. We will continue to monitor closely the environmental performance of the contractor and if there is any further non-compliance of discharge of wastewater exceeding the standards required under the Contract to the Kong Yiu Channel or any other water bodies, appropriate contract enforcement actions will be taken.

Notification Mechanism of Similar Incidents

14. We have also reviewed the existing emergency response plan for all waste facilities in Hong Kong including landfills and the corresponding notification mechanism to ensure prompt response in case of any similar incidents in the future.

Enforcement Action

15. The operation of the NENT Landfill is subject to all prevailing environmental legislation. The contractor is licensed by the EPD under the Water Pollution Control Ordinance (WPCO) and has to abide by the conditions contained therein. Following the leakage incident, the enforcement staff of EPD had inspected the NENT Landfill and detected the discharge of some leaked leachate mixed with rainwater into the surface drains on site which was eventually discharged into the Kong Yiu Channel. While the contractor has been taking measures to contain the leachate within the landfill site, EPD has stepped up monitoring of the NENT Landfill after the leakage incident. In addition to on-site monitoring by EPD's contract management team, random site inspections were carried out by the enforcement staff of EPD every week and water samples were collected from the storm drains near the boundary of the

NENT Landfill when contaminated discharge was suspected. Analysis results of legal samples collected in August and September 2013 indicated that there were a number of occasions where polluting discharges from the landfill were detected. Prosecution against the contractor was initiated on 21 January 2014.

District Liaison Committee

16. To enhance communication among the District Councils, local community and other stakeholders with EPD on the waste management facilities in the district as well as other related issues, we will set up district liaison committees for Tuen Mun / Yuen Long, Sai Kung and North district to better liaise with the local community and monitor the management and operation of waste management facilities, including landfills, in the district.

Conclusion

17. The Administration has taken the leachate leakage incident very seriously. While our environmental monitoring results indicate that the leachate leakage incident did not cause any significant environmental impacts and that immediate remedial actions had been taken by the contractor as well as the relevant government departments to rectify the problem and to prevent future incidents, we will continue to pursue further preventive measures as outlined above. At the same time, we will continue to closely monitor the performance of the contractor to ensure that the operation of the landfill will fully meet all of the legal and contractual standards and requirements.

**Environment Bureau
Environmental Protection Department
January 2014**

Annex A

Summary of water quality testing results at Kong Yiu Channel

| Date of sample taken ⁽¹⁾ | Weather Condition | Chemical Oxygen Demand (mg/L) | 5-day Biochemical Oxygen Demand (mg/L) | Total Suspended Solids (mg/L) | Ammonia-Nitrogen (mg/L) |
|---|-------------------|--------------------------------------|--|-------------------------------|-------------------------|
| 4/10/2013 | Sunny | 12 | 2.5 | <3 | 36 |
| 11/10/2013 | Sunny | 31 | 6.2 | 5.7 | 36 |
| 18/10/2013 | Cloudy | 9 | 6 | <3 | 8.1 |
| 25/10/2013 | Sunny | 29 | 8.7 | 3.9 | 27 |
| 1/11/2013 | Sunny | 21 | 7.5 | <3 | 16 |
| 8/11/2013 | Sunny | 27 | 3.9 | 3 | 5.6 |
| 15/11/2013 | Sunny | 14 | <2 | <3 | 2.1 |
| 22/11/2013 | Sunny | Results not available ⁽²⁾ | | | |
| 29/11/2013 | Sunny | 16 | 5.6 | 6.4 | 8.6 |
| 6/12/2013 | Sunny | 7 | 2.2 | <3 | 5.7 |
| 13/12/2013 | Cloudy | <5 | 2.1 | <3 | 6.1 |
| 20/12/2013 | Sunny | <5 | <2 | <3 | 2.7 |
| 27/12/2013 | Sunny | Results not available ⁽²⁾ | | | |
| 3/1/2014 | Sunny | Results not available ⁽²⁾ | | | |
| 10/1/2014 | Sunny | Results not available ⁽²⁾ | | | |
| 17/1/2014 | Sunny | Results not available ⁽²⁾ | | | |
| 24/1/2014 | Sunny | Results not available ⁽²⁾ | | | |
| Legal requirement (Contractual requirement in parenthesis): | | 80 (30) | 20 (-) | -- (20) | 5 (0.5) |

Remarks :

- On the day of sample collection, there was no discharge from landfill to Kong Yiu Channel, and the water flow was very low. No significant ecological value is recorded along the Kong Yiu Channel, and no serious environmental impact is caused to the ecology and public health. EPD will continue to monitor the situation.
- Water samples could not be collected due to the extremely low water level in Kong Yiu Channel.