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**Panel on Housing**

**Meeting on 1 February 2016**

**Updated background brief on "Lead in drinking water incidents"**

**Purpose**

This paper provides updated background information on the lead in drinking water incidents, and the major views and concerns expressed by Members of the Legislative Council ("LegCo") on the subject.

**Background**

Excess lead found in drinking water samples taken from public rental housing ("PRH") estates

2. Between April and June 2015, the Democratic Party collected drinking water samples from 13 public and private buildings in Kowloon West to test their contents of heavy metals including lead. Four water samples taken from Kai Ching Estate in Kowloon City were found to contain lead that exceeded the World Health Organization ("WHO")'s provisional guideline value<sup>1</sup> of not more than 10 micrograms per litre for lead ("the WHO value").

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<sup>1</sup> As defined under the WHO's Guidelines for Drinking-water Quality published in 2011, a health-based guideline value represents the concentration of a constituent that does not exceed tolerable risk to the health of the consumer over a lifetime of consumption. For the contaminant of lead, the guideline value is designated as provisional because calculated guideline value is below the achievable quantification level as well as the level that can be achieved through practical treatment methods, source control, etc.

3. In July 2015, the Government announced that excessive lead was found in water samples from PRH estates including Kai Ching Estate, Kwai Luen Estate (Phase 2) and Shui Chuen O Estate and in samples of solder used on water pipe joints.

4. The Hong Kong Housing Authority ("HA") announced on 15 July 2015 that water samples would be taken from all PRH estates completed since 2013. On 20 July 2015, the scope of water sampling was further extended to all 12 PRH estates completed in 2011 and 2012. Among these estates, 36 samples from five of these estates were found to have exceeded the WHO value and lead was found in samples of solder in these estates. In view of the development, the Government extended the water sampling tests to PRH estates completed between 2005 and 2010.

5. The Administration announced on 24 September 2015 that systematic water sampling tests for PRH developments completed in and after 2005 had been completed. Water samples from 72 PRH developments were found to comply with the WHO value and 11 PRH developments were found to contain lead content that exceeded the WHO value. The 11 PRH developments included the Kai Ching Estate, Kwai Luen Estate (Phase 2), Wing Cheong Estate, Lower Ngau Tau Kok Estate (Phase 1), Shek Kip Mei Estate (Phase 2), Hung Hom Estate (Phase 2), Tung Wui Estate, Yan On Estate, Choi Fook Estate, Un Chau Estate (Phases 2 and 4), and Ching Ho Estate (Phase 1).

6. At the special meeting of the House Committee on 8 October 2015, the Administration advised that the Water Supplies Department ("WSD") would conduct water sampling tests for the 144 PRH estates completed before 2005 by batches. On 18 November 2015, the Administration announced that all tests had been completed and all samples were found to meet the WHO's guideline limit. The test results are in **Appendix I**.

7. HA announced on 11 November 2015 that from 1 January 2016, tenants in 11 PRH developments in which excess lead in drinking water had been found would receive a subsidy amount of \$660 for offsetting part of the water charges and sewage charges payable. The subsidy involved some \$20 million and would be provided by the four contractors concerned<sup>2</sup>.

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<sup>2</sup> The four contractors concerned were China State Construction Engineering (Hong Kong) Limited, Paul Y General Contractors Limited, Shui On Building Contractors Limited and Yau Lee Construction Company Limited.

### Measures to assist affected tenants

8. For PRH estates where water samples were found to have exceeded the WHO value, the Housing Department ("HD") and WSD arranged for temporary water supply, including the supply of bottled water and the installation of temporary water tanks and pipes outside each block, to facilitate access to drinking water in each affected estate. Connection pipes were extended from the roof-top water tanks to each floor of the building, and lead-reducing water filters were installed for affected tenants.

9. On 30 December 2015, HD announced that filter installation for the PRH developments with excess lead in drinking water had been completed, and all temporary water points had been put into operation. To rectify the problem of excess lead in drinking water, the four contractors concerned would soon begin trials for rectification works in four PRH estates, namely Lower Ngau Tau Kok Estate Phase 1, Kai Ching Estate, Wing Cheong Estate and Kwai Luen Estate Phase 2, by replacing the water pipes in some common areas.

### Public health measures adopted by the Administration

10. The Department of Health ("DH") has provided free blood tests for the more easily affected groups, namely infants, young children under six years of age (including those who were under six years old when moving into the PRH estates concerned), pregnant women and lactating women, and developed care plan for tenants whose blood lead level exceeded the reference value<sup>3</sup>. The scope of blood testing was later extended to children aged below eight, pregnant women and lactating women. DH also made special arrangements for children whose blood lead level exceeding the reference value to receive development assessment.

### Investigations into the incidents

11. Following the outbreak of incidents concerning excess lead found in

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<sup>3</sup> On 18 July 2015, the Secretary for Food and Health convened an inter-departmental meeting with experts of DH and the Hospital Authority to establish the reference value of lead in blood and care plan for residents of the affected PRH estates. The reference value of blood lead level for the more easily affected groups was 5µg per deciliter ("dL") and for adults aged 18 or above was 10 µg/dL.

the drinking water samples taken from PRH estates, the Development Bureau established a task force<sup>4</sup>, led by WSD, to ascertain the causes and recommend measures to prevent recurrence of similar incidents in future. In addition, HA has formed a review committee<sup>5</sup> to review the quality assurance issues relating to fresh water supply of PRH estates.

12. On 25 September 2015, the aforesaid task force announced its preliminary findings. It was found that leaded solder joints installed in the inside service were the cause of excessive lead in drinking water in Kai Ching Estate and Kwai Luen Estate Phase 2. The task force re-affirmed the above findings in its final report released on 31 October 2015<sup>6</sup>.

13. On 30 September 2015, HA announced that it would not consider any new works tenders submitted by the six building contractors<sup>7</sup> which were found to have been involved in the construction of the 11 PRH estates where excessive lead content was found in drinking water for seven months from 1 March to 30 September 2015. Furthermore, China State Construction Engineering (Hong Kong) Limited, Shui On Building Contractors Limited and Yau Lee Construction Company Limited were removed from HA's Premier League of contractors with effect from 1 October 2015.

14. The review committee formed by HA to review the quality assurance issues relating to fresh water supply of PRH estates released the report on its

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<sup>4</sup> According to the paper provided by the Administration for the special meeting of the Panel on Housing on 22 July 2015, the terms of reference ("TOR") of the Task Force on Excessive Lead Content in Drinking Water were to: (a) carry out investigation to ascertain the causes of the recent incidents leading to presence of lead in water drawn by households; (b) recommend measures to prevent recurrence of similar incidents in future; and (c) follow up on a recent case of Legionnaires' disease found at Kai Ching Estate.

<sup>5</sup> TOR of the Review Committee on Quality Assurance Issues Relating to Lead in Fresh Water of Public Housing Estates are: (a) to comprehensively review the present arrangements for quality control and monitoring in relation to the installation of fresh water supply system in public housing estates; (b) in the process of (a), to critically review various aspects of quality inspection relating to materials used (including prefabricated components), quality inspection and works supervision at different stages of construction; and (c) to report findings to HA and recommend any improvement in procedures/guidelines and follow-up actions as necessary.

<sup>6</sup> The press release and the final report are available on the following website: <http://www.info.gov.hk/gia/general/201510/31/P201510310425.htm>.

<sup>7</sup> The six building contractors included China State Construction Engineering (Hong Kong) Limited, Paul Y. General Contractors Limited, Shui On Building Contractors Limited, Yau Lee Construction Company Limited, China Overseas Building Construction Limited, and Paul Y. Construction Company, Limited.

interim findings<sup>8</sup> on 6 October 2015. It held the view that there had been inadequacies of HA's quality control mechanism in relation to the fresh water supply system, and agreed that certain measures need to be immediately put in place by HA to prevent the recurrence of similar incidents. These included requiring main contractors to take water samples for testing for four heavy metals, including lead, in newly installed inside service, requiring the main contractors to submit a management plan covering plumbing subcontractors' supervision and on-site monitoring of plumbing installations, and using quick test methods to check for the presence of lead in solder joints.

15. A Commission of Inquiry ("CoI")<sup>9</sup> was set up on 13 August 2015 under the Commissions of Inquiry Ordinance (Cap. 86) to conduct an independent and comprehensive investigation into the matter. The CoI had commenced substantive hearing on 2 November 2015 and is expected to report to the Chief Executive within nine months from the date of appointment.

16. At the Council meeting of 14 October 2015, Hon Gary FAN Kwok-wai moved a motion seeking the Council's authorization for the appointment of a select committee to inquire into lead in drinking water incidents and related issues. The motion was negatived.

### **Major views and concerns expressed by Members**

17. The views and concerns expressed by LegCo Members on the subject at the meetings of the Panel on Housing, Panel on Health Services and the House Committee since July 2015 are summarized in the ensuing paragraphs.

#### Ascertaining the source of excess lead found in tap water

18. Members in general considered it a top priority for the Administration to find out the source of excess lead in the drinking water samples taken from PRH estates concerned, and identify residential developments for

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<sup>8</sup> The report is available on the website of HA (<http://www.housingauthority.gov.hk/en/about-us/news-centre/press-releases/report.html>).

<sup>9</sup> The CoI is tasked to: (a) ascertain the causes of excess lead found in drinking water in PRH developments; (b) review and evaluate the adequacy of the present regulatory and monitoring system in respect of drinking water in Hong Kong; and (c) make recommendations with regard to the safety of drinking water in Hong Kong.

which lead was used in the soldering materials of fresh water supply systems. Members urged the Administration to publish the relevant investigation reports in full as soon as practicable.

#### Scope and validity of water sampling tests

19. Members considered that to alleviate public concern, the Administration should draw up a timetable for conducting water sampling tests for all public housing estates. The Panel on Housing passed a motion at the special meeting on 22 July 2015 urging the Government to, inter alia, carry out the water sampling tests expeditiously.

20. According to the Administration, the work of water sampling tests was constrained by the number of accredited laboratories in Hong Kong. HD and HA would conduct water sampling tests for PRH developments, other owners or agents concerned (usually the property management agent or the owners' committees) could employ accredited laboratories to take water samples and carry out the tests.

21. Some Members queried the validity of the water sampling tests conducted by the Government as the water samples were collected after running the tap for a few minutes, and requested the Government to collect and test samples of stagnant water in pipes as well. The Administration explained that the water sampling means and procedures varied across countries/cities depending on their unique situations. The current practice of collecting samples after running the taps for two to five minutes complied with the WHO standard, whereas samples of stagnant water in pipes were only indicative of the quality of drinking water upon remaining in the water pipes for a period of time, and did not reflect the quality of the water to be taken by an individual daily.

#### Measures to assist affected tenants

##### *Water supply for the affected PRH estates*

22. Members stressed the need for the Administration to ensure that the quality of temporary water supply to the affected PRH estates was up to standard, and to assist the elderly, infirm and persons with disabilities to get water from the temporary water supply points.

23. Some Members suggested that the Administration should install lead-reducing water filters for affected tenants. The Administration advised that all the main contractors had submitted proposals to HA to install, for affected households, filters with U.S. National Sanitation Foundation's NSF 53 certification for lead reduction, and to replace the filter cores for them free-of-charge within two years. Members also urged the Administration to replace sub-standard water taps/pipes of the affected PRH estates as soon as practicable.

*Blood tests and medical follow-up for affected tenants*

24. Members strongly urged the Administration to expand the scope of free blood tests to cover children who were under six years old when moving into the concerned PRH estates and residents suffering from chronic diseases. Some Members further considered that blood tests should also be provided for people who belonged to the three easily affected groups and were residing in the affected PRH estates even though they were not the family members of the PRH tenants of the affected estates.

25. Members were deeply concerned about the long waiting time of around three to four weeks for the blood testing services provided by the Hospital Authority and DH. In Members' view, the Administration should expedite collection and testing of blood samples, such as by way of portable devices, and/or deploying additional resources in collaboration with the private healthcare sector. Some Members considered that the Administration should enhance the overall blood lead testing capacity through public-private partnership, such as providing affected residents with "blood testing vouchers" for taking the tests in the private sector, arranging outreach blood-taking services, engaging more overseas laboratories and purchasing more equipment for blood testing.

26. The Administration advised that as at the end of August 2015, the Hospital Authority had arranged seven public hospitals to provide blood taking service at weekends, and made arrangement with two private hospitals in providing additional blood taking service. The Hospital Authority had endeavored to enhance the throughput of blood taking and testing with the purchase of new blood testing equipment, sending of blood samples to overseas laboratories for testing, and the deployment of the Hospital Authority healthcare personnel to work overtime.

27. Some Members were concerned that the current blood test might not be able to detect residue of lead contamination in the body, given that the half-life of lead in blood was approximately 30 days once the source of contamination had been eliminated. They suggested that other than blood test, hair and urine tests for lead should be considered. The Administration advised that whole blood lead level was internationally recognized as the most accurate and reliable method for screening and diagnosis to assess the risk of lead on health. Hair and urine tests for lead were not suitable for screening and diagnosis.

28. Members considered that the Administration should explain clearly to tenants the potential health impacts associated with taking lead-contaminated water, and provide medical assistance to affected tenants with an elevated blood lead level.

#### *Supporting services and compensation*

29. Members opined that the Administration should centralize dissemination of information by various bureaux/departments about the findings of water sampling tests and progress of follow-up measures. There was a suggestion that counselling and emotional support should be provided to affected tenants by setting up one-station service counters at the PRH estates concerned and stationing social workers thereat.

30. Some Members expressed concerns about the inconvenience caused to and expenses incurred by the affected tenants as they had to take water from temporary water supply joints and/or purchase bottled water for consumption. Besides, the tenants might use more water than before as they were advised by the Government to run tap water for a few minutes to flush faucets before using water for drinking or cooking. Members therefore requested the Administration to consider waiving the water charges and/or rentals of the households concerned for a certain period of time and paying the medical expenses for the affected tenants with an elevated blood lead level.

#### Monitoring of waterworks

31. Members considered that the incidents of excess lead found in drinking water reflected inadequacies in respect of waterworks monitoring and inspection, and urged the Administration to take rectification measures to ensure that the supply of water in new housing developments would be up



to standard. In this connection, some Members suggested the Administration review the Waterworks Ordinance (Cap. 102) ("WO") and the licensing requirements for Authorized Persons and licensed plumbers.

32. The Administration advised that subsequent to the incidents, HA had put in place measures to incorporate in all relevant HA contracts additional water sampling requirements and the checking of lead content, and to step up inspection on soldering materials used at water pipe joints of public housing estates. Depending on the findings of the ongoing investigation, the Government would initiate legislative amendments to WO if necessary.

### **Latest development**

33. The Administration will brief members on the final report of the review committee formed by HA at the Panel meeting on 1 February 2016.

### **Relevant papers**

34. A list of relevant papers is set out in **Appendix II**.

Council Business Division 1  
Legislative Council Secretariat  
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# Appendix I

## Test results of water samples taken from public rental housing estates completed before 2005

The Housing Department (HD) and the Water Supplies Department (WSD) had been conducting a representative screening for public rental housing (PRH) estates completed before 2005 in which the fresh water supply systems were installed by the Hong Kong Housing Authority, to determine whether the lead content in drinking water exceeded the World Health Organisation (WHO)'s provisional guideline value of not more than 10 micrograms per litre. In general, HD and WSD took water samples for testing by batches in accordance with the completion year of the PRH estates, starting with newly completed estates and working back to the older ones. HD and WSD have now completed water screening tests for all PRH estates completed before 2005.

(Results announced for 144 PRH estates involving 2634 water samples up to 18 November 2015)

### Lead content in water samples complying with WHO's provisional guideline value

Tsui Ping (South) Estate	Lee On Estate	Butterfly Estate	Choi Fai Estate	Sai Wan Estate	Choi Yuen Estate	Tin Yan Estate	Tsz Lok Estate	Oi Tung Estate
Kwai Shing (East) Estate	Kin Ming Estate	Tin Yuet Estate	Po Tat Estate	Lei Yue Mun Estate	Tin Heng Estate	Tin Chak Estate	Sau Mau Ping Estate	Fu Tai Estate
Wang Tau Hom Estate	Ap Lei Chau Estate	Lei Muk Shue (I) Estate	Chun Shek Estate	Pak Tin Estate	Ka Fuk Estate	On Yam Estate	Sheung Tak Estate	Cheung Hang Estate
Yiu Tung Estate	Tsz Man Estate	Wah Sum Estate	Shek Lei (I) Estate	Tin Wan Estate	Ko Yee Estate	Wan Hon Estate	Sheung Lok Estate	Tsz Ching Estate
Kwai Fong Estate	Chung On Estate	Ho Man Tin Estate	Ko Cheung Court (the PRH portion)	Upper Wong Tai Sin Estate	Tin Shui (II) Estate	Tai Wo Hau Estate	Cheung Hong Estate	Hau Tak Estate
Shun Tin Estate	Wan Tsui Estate	Sun Chui Estate	Mei Lam Estate	Kwong Fuk Estate	Shek Kip Mei Estate	Lung Hang Estate	Lei Muk Shue (II) Estate	Hing Wah (I) Estate
Shek Wai Kok Estate	Oi Man Estate	Yau Oi Estate	Lai Kok Estate	Sam Shing Estate	Kwai Shing West Estate	Lek Yuen Estate	Lai King Estate	Kai Yip Estate
Un Chau Estate	Siu Sai Wan Estate	Hing Man Estate	Chuk Yuen (South) Estate	Cheung Ching Estate	Sha Kok Estate	Tai Yuen Estate	Choi Wan (I) Estate	Cheung Wang Estate
Shui Pin Wai Estate	Ping Shek Estate	Ma Tau Wai Estate	Shek Lei (II) Estate	Tsz Hong Estate	Wah Lai Estate	Kwai Chung Estate	Ping Tin Estate	Lok Fu Estate
Shek Yam East Estate	Wah Fu (II) Estate	Fu Shan Estate	Lai Yiu Estate	Tin Tsz Estate	Hing Tung Estate	Tin Shui (I) Estate	Wu King Estate	Tin Yiu (I) Estate
Tin Yiu (II) Estate	Wah Fu (I) Estate	Mei Tung Estate	Yat Tung (I) Estate	On Ting Estate	Tai Hing Estate	Wo Che Estate	Shun On Estate	Choi Hung Estate
Lung Tin Estate	On Tin Estate	Yau Tong Estate	Cheung Shan Estate	Fuk Loi Estate	Hoi Lai Estate	Tai Hang Tung Estate	Lower Wong Tai Sin (II) Estate	Ma Hang Estate
Shek Yam Estate	Tin Wah Estate	Upper Ngau Tau Kok Estate	Lok Wah (North) Estate	Yat Tung (II) Estate	Fu Cheong Estate	*Tin Yat Estate	*High Prosperity Terrace	*Easeful Court
*Shek Lei Interim Housing	*Hong Tung Estate	*Fu Tung Estate	*Ming Tak Estate	*Shun Lee Estate	*Grandeur Terrace	*Po Tin Estate	*Kam Peng Estate	*Ngan Wan Estate
*Lok Wah (South) Estate	*Yue Wan Estate	*Nga Ning Court	*Tsui Lok Estate	*Kai Tin Estate	*Lai On Estate	*Kwong Tin Estate	*Cheung Kwai Estate	*Chak On Estate
*Sun Tin Wai Estate	*Wo Lok Estate	*Hung Hom Estate	*Choi Wan (II) Estate	*Fortune Estate	*Nam Shan Estate	*Model Housing Estate	*Hing Wah (II) Estate	*Long Bin Interim Housing

\*30 estates announced on 18 November

Source: Annex to the Government press release issued on 18 November 2015 entitled "Hong Kong Housing Authority completes water sampling tests for all public rental housing estates"

**Lead in drinking water incidents**

**List of relevant papers**

Papers issued for Committee meetings

<b>Committee/ Date of meeting</b>	<b>Relevant papers</b>
<p>Panel on Housing (Special meeting on 22 July 2015)</p>	<p><a href="#">Paper</a> provided by the Administration entitled "Excessive Lead in Fresh Water Supply in Public Housing Estates"</p> <p><a href="#">Background brief</a> prepared by the Legislative Council ("LegCo") Secretariat entitled "Excessive Lead found in Tap Water Samples from Public Rental Housing Estates"</p> <p><a href="#">Speaking note</a> of the Secretary for Transport and Housing (Chinese version only)</p> <p><a href="#">Speaking note</a> of the Acting Secretary for Development (Chinese version only)</p> <p><a href="#">Speaking note</a> of the Secretary for Food and Health ("SFH") (Chinese version only)</p> <p><a href="#">Motion</a> on "Excessive lead found in tap water samples from public rental housing estates" passed at the special meeting</p> <p><a href="#">The Administration's response</a> to the concerns and suggestions raised by Members at the special meeting</p>
<p>Panel on Health Services (Special meeting on 24 August 2015)</p>	<p><a href="#">Paper</a> provided by the Administration entitled "Public health measures for the lead in drinking water incidents"</p> <p><a href="#">Background brief</a> prepared by the LegCo Secretariat entitled "Public health measures for the lead in drinking water incidents"</p>
<p>House Committee (Special meeting on 1 September 2015)</p>	<p><a href="#">Paper</a> provided by the Administration entitled "Lead in drinking water incidents"</p> <p><a href="#">Background brief</a> prepared by the LegCo Secretariat entitled "Lead in drinking water incidents"</p>

<b>Committee/ Date of meeting</b>	<b>Relevant papers</b>
	<p><a href="#">Information</a> on the test results of blood lead level of public estate residents affected by lead in drinking water incidents (as at 1700 hours on 27 August 2015) provided by the Administration</p> <p><a href="#">Speaking note</a> of the Chief Secretary for Administration (Chinese version only)</p>
<p>House Committee (Special meeting on 8 October 2015)</p>	<p><a href="#">Paper</a> provided by the Administration entitled "Lead in drinking water incidents"</p> <p><a href="#">Updated background brief</a> prepared by the LegCo Secretariat entitled "Lead in drinking water incidents"</p> <p><a href="#">Speaking note</a> of the Chief Secretary for Administration (Chinese version only)</p> <p><a href="#">Speaking note</a> of the Acting Secretary for Transport and Housing (Chinese version only)</p>
<p>House Committee (Meeting on 9 October 2015)</p> <p>Legislative Council (Meeting on 14 October 2015)</p>	<p><a href="#">Joint letter</a> dated 14 August 2015 from 27 Members seeking the Council's authorization for the appointment of a select committee to inquire into lead in drinking water incidents and related issues (Chinese version only) <i>(for discussion at the House Committee meeting)</i></p> <p><a href="#">Two motions</a> moved by Hon Gary FAN Kwok-wai and Hon Cyd HO Sau-lan under the Legislative Council (Powers and Privileges) Ordinance (Cap. 382)</p>
<p>Panel on Housing (Meeting on 2 November 2015)</p>	<p><a href="#">Paper</a> provided by the Administration entitled "Excess lead in drinking water in public housing estates incident"</p> <p><a href="#">Background brief</a> prepared by the LegCo Secretariat entitled "Lead in drinking water incidents"</p> <p><a href="#">Speaking note</a> of the Under Secretary for Transport and Housing (Chinese version only)</p> <p><a href="#">The Administration's response</a> to the concerns and suggestions raised by members at the meeting</p>

Government press releases

Press releases issued by the Government on the incidents of excess lead in drinking water are available on the following website:  
<http://www.isd.gov.hk/drinkingwater/eng/press.html>.

Council Business Division 1  
Legislative Council Secretariat  
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