

## District Council Information Paper

### Enhanced Water Quality Monitoring Programme

#### Purpose

This Paper briefs Members on the Enhanced Water Quality Monitoring Programme (“Enhanced Programme”) under the Action Plan for Enhancing Drinking Water Safety in Hong Kong<sup>1</sup> (“Action Plan”) announced on 21 September 2017.

#### Background

2. The Water Supplies Department (“WSD”) has been supplying drinking water in full compliance with the World Health Organization’s Guidelines for Drinking-water Quality (“WHO Guidelines”) up to the connection points to the consumers (“connection points”).

3. Hong Kong has all along been making reference to the Guideline Values (“GVs”)/Provisional Guideline Values (“PGVs”) of the WHO Guidelines in monitoring the quality of drinking water up to the connection points. WSD has engaged an expert consultant to carry out a comprehensive review on drinking water quality standards and methodologies of setting these standards in overseas jurisdictions<sup>2</sup> for establishing the drinking water standards for Hong Kong. Having taken into account the consultant’s findings and the advice of the International Expert Panel on Drinking Water Safety (“IEP”)<sup>3</sup>, WHO’s GV/PGVs are recommended to be adopted as the drinking water standards in Hong Kong. Nonetheless, IEP advised that a review on the aforesaid standards should be carried out when new information is available from WHO’s revision of its Guidelines or when sufficient local data is available with a view to assessing the appropriateness to adopt standards beyond WHO Guidelines (“WHO+”) for certain parameters. Against this, IEP

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<sup>1</sup> The Action Plan comprises five components viz. "Drinking water standards and enhanced water quality monitoring programme", "Plumbing material control and commissioning requirements for new plumbing installations", "Water safety plans", "Water safety regulatory regime" and "Publicity and public education".

<sup>2</sup> They include two international organisations (viz. World Health Organization (WHO) and European Union (EU)) and seven overseas nations (viz. the United Kingdom (UK), United States of America (USA), Canada, Australia, New Zealand, Singapore and Japan).

<sup>3</sup> The IEP was appointed by the Secretary for Development (“SDEV”) in June 2016, comprising five members viz. three overseas experts from Australia, Canada and the United Kingdom and two local experts, to advise SDEV on the proposal of DEVB/WSD on drinking water safety.

advised that the current water quality monitoring programme<sup>4</sup> of WSD be enhanced by collecting random water samples from consumers' drinking taps for testing six metals, viz. lead, cadmium, chromium, nickel, copper, and antimony, which could be present in the internal plumbing systems.

### **Overview of Enhanced Programme**

4. With reference to overseas practices<sup>5</sup>, the number of water samples would be calculated according to the population of the 18 district council districts. Accordingly, about 670<sup>6</sup> premises will be randomly selected from the water accounts in the territory<sup>7</sup> each year under the Enhanced Programme. WSD has engaged an independent consultant to administer the random selection process. The Registered Consumer(s) ("RC(s)") and occupiers of the selected premises will receive invitation letters to participate in the Enhanced Programme.

5. Participation of the selected premises in the Enhanced Programme is non-mandatory. In order to ensure that the required number of water samples is collected, WSD will issue invitation letters to more premises than the target number of samples required<sup>8</sup>. Thus, WSD may not collect water samples from all the premises that have received the invitation letters under the Enhanced Programme. A sampling team consisting of a WSD's water sampler<sup>9</sup> and the consultant's licensed plumber will visit the premises to collect water samples. The sampling visit will take place during the sampling period mentioned in the invitation letters which commences in about two weeks after the invitation letters are issued. The sampling time in each premises is about an hour for collecting the water samples as detailed below.

6. In regard to the water sampling protocol, the IEP has endorsed the adoption of a two-tier sampling protocol<sup>10</sup> for the six metal parameters

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<sup>4</sup> At present, WSD has been taking water samples for monitoring from its waterworks including water treatment works, service reservoirs and from publicly accessible places such as shopping centres, clinics, community facilities, sports grounds, markets, government offices, estate management offices, etc.

<sup>5</sup> The sampling rates in UK are: one sample for population < 100; four samples for population between 100 and 4 999; and eight samples for population between 5 000 and 100 000.

<sup>6</sup> Based on the latest population data published by the Census and Statistics Department in February 2017.

<sup>7</sup> In addition, in order to put the minds of residents at ease, the IEP agreed that the Government could take additional water samples from post-2005 PRH developments for testing of lead in conjunction with the Enhanced Programme if such developments were not selected for testing under the first year of the programme. The testing results of these additional samples would be separated from the statistics of the Enhanced Programme.

<sup>8</sup> It is to cater for unsuccessful entry to some of the invited premises (e.g. the door is not answered) for collection of water samples.

<sup>9</sup> The WSD's water sampler will wear uniform and carry a WSD's staff card for identification purpose during the visit.

<sup>10</sup> Taking into account the findings of the review of the water sampling protocols adopted in two international

involving the testing of stagnant water, namely (i) Tier 1 – Random Day Time (“RDT”) sampling<sup>11</sup> for determining the metal exposure of consumers to the six metals; and (ii) Tier 2 – 30-minute stagnation (“30MS”) sampling<sup>12</sup> for verification of exceedance found in the Tier 1 water sample<sup>13</sup>, which will only be tested in case of exceedance being found in the Tier 1 water sample<sup>14</sup>. In addition, auxiliary samples<sup>15</sup> will also be collected which will only be tested to provide supplementary information if exceedance case (i.e. when there are exceedances in both the two-tier samples) is found for determining the follow up actions required.

7. WSD will provide the test result of the water sample(s) to the RC and occupier of the concerned premises within two weeks from the sampling day by mail if it is not an exceedance case. WSD will also publish on its website statistics of the water sampling test results under the Enhanced Programme every week. However, WSD will not reveal the identity of the participant and the full address of the premises unless relevant parties (e.g. the RC, the occupier and the owner, etc.) give their explicit permission or when public health is at risk<sup>16</sup>.

### **WSD’s Assistance in case of Exceedance**

8. In the event of exceedance case, WSD will as soon as possible notify the concerned RC and occupier (and the owner as far as practicable) of the test results, provide information on the related health risks, and advise on possible mitigation measures (see Paragraphs 11 and 12 below) and the follow-up actions required. WSD will also offer the RC a one-off free preliminary investigation into the cause and location of exceedance.

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organisations (viz. WHO and EU) and several overseas nations (viz. UK, Germany, United States of America (USA), Canada, Australia, New Zealand, Singapore and Japan) for water quality monitoring.

<sup>11</sup> For RDT sampling, a 1L unflushed sample will be taken at random during normal working hours in daytime from a drinking water tap of consumer. No flushing will be carried out by the sampler before taking the water sample whilst the internal plumbing system may or may not have been used by the consumer before the sampling. Therefore, RDT samples involve taking unflushed samples with various stagnation times. The 4th Edition incorporating the 1st Addendum of the World Health Organization Guidelines for Drinking-water Quality indicates that RDT samples reflect most truly the water that the consumer drinks.

<sup>12</sup> For 30MS sampling, the tap should first be flushed for 5 minutes and then stagnated for 30 minutes before a 1-L unflushed sample is taken.

<sup>13</sup> It is to verify that the exceedance in the Tier 1 RDT sample is not caused by unduly long stagnation (e.g. the water tap has not been used for a long time after vacation or other reasons)

<sup>14</sup> Tier-2 30MS water sample will not be tested if there is no exceedance found in the Tier-1 RDT water sample.

<sup>15</sup> A number of 1-litre sequential samples from taps (generally 4 to 6 samples) will be taken for assessing whether the exceedance is confined to the premises or not, and a 2-minute flushed sample will be taken to confirm applicability of flushing advice as a mitigation measure in case of exceedance.

<sup>16</sup> “Public health is at risk” in the context of the Enhanced Programme is defined as “members of the public, unknowingly, being supplied with contaminated water for consumption”.

9. Moreover, if WSD assesses that there is a possibility<sup>17</sup> of exceedance in other premises in the same building, WSD will notify the relevant parties responsible for maintaining and managing the building (such as building management, owners' associations, etc.) ("Relevant Parties"). They will be advised to arrange detailed investigations including engaging a qualified consultant to verify the problem of exceedance and to establish its extent in the building.

10. To support the Relevant Parties to arrange the detailed investigation in a timely manner, WSD has worked in collaboration with the relevant professional disciplines (e.g. building services engineers, building surveyors, etc.) and drawn up a list of qualified consultants and a list of qualified persons<sup>18</sup> capable of carrying out the investigation. In addition, WSD has issued a guidance manual on the methodology to carry out the detailed investigation for their reference. WSD will also provide support to the Relevant Parties as necessary who require technical advice in the process of the detailed investigation.

### **Mitigation Measures for Exceedance of Six Metals**

11. In the event of exceedance case, the following mitigation measures should be taken before the completion of rectification works for the plumbing systems of the concerned premises:

- (i) If result of the 2-minute flushed sample (see footnote 15) shows no exceedance, consumers should run the drinking water tap for at least two minutes each and every time before drawing water for cooking or drinking. Moreover, if lead is the parameter with exceedance, alternative water sources, such as distilled water or water drawn through a certified filter (e.g. NSF 53 certified filters that have been tested for removal of lead) should be used for the more easily affected groups (i.e. children aged below 6, pregnant women and lactating women) for maximal protection.

- (ii) If result of the 2-minute flushed sample shows exceedance,

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<sup>17</sup> Exceedance of water samples in a premises may either be a standalone case or there may be possibility of similar exceedance in other premises in the same building. For the former, renovation and/or routine maintenance of a premises sometimes may alter the internal plumbing system of the premises (e.g. replacement of water taps or realignment of water pipes) and use water pipes and fittings not complying with the statutory standards resulting in the exceedance. For the latter, the exceedance could be caused by the use of non-compliant water pipes and fittings during construction of the plumbing systems for all or some premises in the building.

<sup>18</sup> The list of qualified consultants and the list of qualified persons are available on WSD website [www.wsd.gov.hk/en/dwsewqmp](http://www.wsd.gov.hk/en/dwsewqmp).

consumers should use only alternative water sources for cooking, drinking or baby formula preparation.

12. The flushing measure mentioned in paragraph 11(i) above is to remove the stagnant water including, if any, the loose metal particulate in the internal plumbing system. It serves as one of the general effective interim measures to substantially reduce the metal content in water. In any event, as hot water may increase the amount of metal leaching from the pipes and fittings, consumers are advised to use only cold tap water for cooking or drinking. Nonetheless, it is of utmost importance to investigate the cause of the exceedance and carry out necessary rectification work for the internal plumbing system.

13. For premises with exceedance and whose drinking water is supplied for potable consumption either by the public (e.g. restaurants) or, in case of lead exceedance, the more easily affected groups (e.g. kindergartens), WSD will work with the RC and occupier of the premises with a view to implementing contingent measures for avoiding water that exceeds the drinking water standards from being supplied to the public or easily affected group in case of lead exceedance. WSD will undertake to follow up the progress of the mitigation/rectification works in these premises.

### **Health Message and Health Advice for Six Metals in Drinking Water**

14. Lead is a naturally occurring heavy metal which has widespread industrial use, and it may be found at low levels in urban dust, contaminated food and water. Antimony, cadmium, chromium, copper and nickel are naturally occurring metals which are widely used by industries and present in the environment.

15. Experience gained from the incident of excess lead in drinking water in 2015 showed that the most important element of clinical management for people having consumed lead contaminated water is cessation of further exposure to contaminated water. No chelation therapy or specific treatment is required for those with mildly elevated blood lead level (BLL). Over time, lead will pass out of the body. Screening of BLL did not affect clinical management.

16. For the five metals, the World Health Organization's drinking water guideline values are stringent and set at levels substantially lower than those causing clinical poisoning. The risk of causing significant health effects due to consumption of drinking water tainted with these metals is assessed to be very low.

17. The public should follow WSD's advice to cultivate good habits of water use<sup>19</sup>. From health perspective, it is always good to have blood lead as low as possible. The Department of Health has published two pamphlets<sup>20</sup> to introduce health effects of lead and the five metals, and practical measures to minimize their exposure from all sources in daily life.

18. Persons with history of consumption of drinking water contaminated with lead and the five metals who present with relevant symptoms or are unduly concerned may consult their doctor for advice and counseling. The doctor will see if investigations and referrals are required as part of clinical management.

### **Commencement of Enhanced Programme**

19. WSD has progressively rolled out the publicity and public education programmes on the Enhanced Programme through various publicity channels<sup>21</sup> in order to raise public awareness of the Enhanced Programme and clearly explain its importance for the drinking water safety in Hong Kong. WSD has sent out invitation letters to the first batch of premises randomly selected for water sampling which will begin by end of December 2017.

20. Members are invited to note the details of the Enhanced Programme.

Water Supplies Department  
Department of Health  
December 2017

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<sup>19</sup> The leaflet on "Water Use Tips" is at **Enclosures**. The leaflet is also available on WSD website [www.wsd.gov.hk/en/actionplan](http://www.wsd.gov.hk/en/actionplan) and is also available to the public at any Customer Enquiry Centre of WSD, Home Affairs Enquiry Centre and PRH estates.

<sup>20</sup> The pamphlets on "What you need to know about lead in drinking water on health" and "What you need to know about antimony, cadmium, chromium, copper and nickel in drinking water on health" are at **Enclosures**. The pamphlets are also available on DH website [http://www.chp.gov.hk/en/view\\_content/40434.html](http://www.chp.gov.hk/en/view_content/40434.html) and are also available to the public at any Customer Enquiry Centre of WSD, Home Affairs Enquiry Centre and PRH estates.

<sup>21</sup> After the announcement of the Action Plan on 21 September 2017, WSD has progressively rolled out the publicity and public education programmes on the Enhanced Programme through various channels such as dedicated webpages, leaflets, public seminars and briefings to different users/stakeholder groups including property management agents and operators of specific premises, such as kindergartens, schools, welfare units, restaurants, etc. The leaflet on "Enhanced Water Quality Monitoring Programme" is at **Enclosures**. The leaflet is also available on WSD website [www.wsd.gov.hk/en/actionplan](http://www.wsd.gov.hk/en/actionplan) and is also available to the public at any Customer Enquiry Centre of WSD, Home Affairs Enquiry Centre and PRH estates.