Drinking Water Safety Advisory Committee
Second Meeting

Date : 31 July 2018 (Tuesday)
Time : 9:30 a.m. to 12:10 p.m.
Venue : Conference Room 1, G/F, Central Government Offices, 2 Tim Mei Avenue, Tamar, Hong Kong

Minutes of Meeting

Members Present

Ir LEUNG Kwong Ho, Edmund	Chairman
Ir Dr CHAN Hon Fai	Vice Chairman
Dr CUNLIFFE David Anthony	
Mr HO Kui Yip, Vincent	
Prof LAU Kar Pui, Susanna	
Ir Prof LO Man Chi, Irene	
Dr MA Yiu Wa, Anthony	
Dr WONG Siu Ming, Raymond	
Dr WONG TAAM Chi Woon, Vivian	
Ir WONG Yiu Sun, Peter	
Mr HON Chi Keung	Permanent Secretary for Development (Works)
Dr CHING Cheuk Tuen, Regina	Consultant Community Medicine (Non-Communicable Disease), Department of Health
Mr WONG Chung Leung	Director of Water Supplies
Mr TSUI Wai	Secretary Team Leader (Water Safety), Development Bureau ("DEVB")

Members Absent with Apology

Prof HO Kin Chung

Prof TSE Lap Ah, Shelly

In Attendance

Mr CHAU Siu Hei, Francis	Deputy Secretary for Development (Works) 3
Mr CHU Siu Ki	Assistant Secretary (Infrastructure Coordination) 2, DEVB
Ms FOK Ka Lai	Assistant Secretary (Water Safety) 1, DEVB
Mr CHAN King Yuen	Assistant Secretary (Water Safety) 2, DEVB
Mr CHAU Sai Wai	Deputy Director of Water Supplies
Mr LAM Saint Kit, Byron	Assistant Director/Task Group, Water Supplies Department ("WSD")
Mr KWOK Yau Ting, Kelvin	Chief Chemist, WSD
Mr YU Chi Wing	Senior Chemist/Water Quality (Standards and Monitoring), WSD
Mr FUNG Cheuk Pong, Ronald	Engineer/Quality System, WSD
For agenda item 3 only	
Mr WONG Albert	Representative of DEVB's consultant
Ms SHIEH Kate	Representative of DEVB's consultant
Mr ROUSE Michael	Representative of DEVB's consultant

Action by

Agenda Item 1: Confirmation of Minutes of the Last Meeting

1. The Secretary circulated the draft minutes of the first meeting on 19 March 2018 and received proposed amendments from a Member. The draft minutes were revised accordingly and circulated on 19 July 2018. Since no further comment was raised at the meeting, the revised draft minutes were confirmed.

Agenda Item 2: Updates on Action Plan for Enhancing Drinking Water Safety in Hong Kong

2. Mr Kelvin KWOK, Chief Chemist of WSD, updated Members on the latest situation of the implementation of the Action Plan.

3. The Chairman asked about the success rate of getting into the selected premises for collecting water samples under the Enhanced Water Quality Monitoring Programme (Enhanced Programme). Mr Kelvin KWOK replied that as the sampling teams would visit the selected premises at any daytime hours, there were some cases of nobody answering the door. For most of the other premises, since they were given the details of the Enhanced Programme such as the objectives and sampling arrangement beforehand through the invitation letters, their response was in general quite good. Mr Kelvin KWOK added that, as a

sufficient number of backup premises had been selected, there was basically no problem in collecting the target number of samples. The Chairman remarked that sufficient promotion of the Enhanced Programme would help the public understand the programme better and in return enable smooth running of the Enhanced Programme.

4. Mr Kelvin KWOK also briefly recapped the details of the Enhanced Programme, including the 2-tier sampling protocol and random selection of sampling premises.

5. Furthermore, Mr Kelvin KWOK briefed Members on the 6-Hour Stagnation (6HS) water sampling test being adopted as one of the commissioning requirements of new plumbing works. In response to a Member's enquiry about the passing rate of the 6HS water sampling test for new plumbing works, Mr Kelvin KWOK replied that, with the completion of the systematic flushing before testing, the passing rate in the first attempt was high. For those isolated cases with test results exceeding the relevant Hong Kong Drinking Water Standards (the Standards), the responsible licensed plumbers would be informed to carry out systematic flushing of the plumbing system again for retesting. On Members' request, WSD would provide statistic of the failure rate in the first attempt of 6HS water sampling test in the commissioning of new plumbing works. **WSD**

6. A Member noted that a different sampling protocol was adopted in handling the recent water quality incident in Kwai Tsui Estate as compared with that adopted under the Enhanced Programme. Besides, he asked whether the tenants/owners of the premises should be present to witness the course of taking water samples. Mr CL WONG, Director of Water Supplies, explained that different sampling protocols would be used for different purposes. For the Enhanced Programme, it involved adoption of a two-tier sampling protocol, viz. the Random Day Time (RDT) and 30-Minute Stagnation (30MS) samples, and random selection of premises for sampling, with a view to collecting water quality data in the territory for reviewing the Standards. On the other hand, for the Kwai Tsui Estate incident, since the plumbing system was newly commissioned, the 6HS sampling protocol was adopted to verify if the new copper alloy fittings had been sufficiently flushed according to the commissioning requirements. Besides, WSD had obtained the consent of the occupiers through Housing Authority (HA) to enter the flats to collect water samples to verify the drinking water quality which had been reported to have exceedance in lead content. Mr CL WONG added that WSD's samplers were well trained to collect water samples, and therefore they would not invite the tenants/occupiers to witness the sampling process but of course would

not decline them to do so. Mr CK HON, Permanent Secretary for Development (Works), supplemented that HA would soon commence retesting of post-2005 Public Rental Housing Estates in respect of lead content in drinking water using the 2-tier sampling protocol of the Enhanced Programme.

Agenda Item 3: Interim Endorsement Mechanism for Hong Kong Drinking Water Standards
(DWSAC Paper No. 6/2018)

7. Mr KY CHAN, Assistant Secretary (Water Safety) 2 of DEVB, briefed Members on the proposal to adopt an interim endorsement mechanism for the Standards based on the recommendations made by their consultant for the study on formulating a suitable water safety regulatory regime for Hong Kong. Mr KY CHAN explained the details of each of the six key steps under the proposed interim endorsement mechanism, namely (1) triggering for review; (2) initiating review and updates to Standards; (3) seeking technical opinions/technical inputs; (4) consulting wider group of stakeholders; (5) endorsing Standards; and (6) notifying and communicating changes.

8. Noting that there would be proposed changes to the Standards for discussion in the coming meeting and the proposal would be quite technical and informative, the Chairman suggested the Secretary to circulate the discussion paper early to allow adequate time for Members' perusal. **Secretary**

9. In response to a Member's suggestion of involving Food and Health Bureau in the interim endorsement mechanism, another Member shared his overseas experience that the regulation of food and water were usually carried out by separate parties. Nevertheless, consultation with the Food and Environmental Hygiene Department on proposed changes to the Standards would be appropriate.

10. In response to a Member's enquiry as to whether the paper only served to notify Members of the implementation of the interim endorsement mechanism, Mr Francis CHAU, Deputy Secretary for Development (Works) 3 of DEVB, clarified that the paper served to seek comments from Members on the proposed endorsement mechanism. If there were comments from Members on the proposed interim mechanism, it could be revised or fine-tuned prior to implementation.

11. A Member asked how events that might trigger a review to the Standards

would be kept track of and which party would be responsible for the work. Mr Francis CHAU replied that there was a dedicated team of colleagues in WSD responsible for keeping track of events, such as emerging contaminants, that might trigger a review to the Standards. In addition, WSD had engaged a consultant to help review overseas drinking water quality incidents and evaluate their implication in local context. With such a "radar" system in place, WSD would be able to identify events that might trigger a review and bring forward the issues for Members' discussion. In response to a Member's follow-up enquiry on whether more details of WSD's "radar" system could be shared with, Mr SW CHAU, Deputy Director of WSD, replied that WSD would introduce the "radar" system in greater detail under Agenda Item No. 7 shortly.

12. Since Members would only meet twice a year, a Member pointed out that urgent issues requiring Members' endorsement to proceed with the review to the Standards might not be able to be discussed in time. In response, Mr Francis CHAU said that for urgent matters, the relevant discussion papers could be circulated to Members for review and comment. Another Member shared his observation of how World Health Organization (WHO) tackled the issue related to emerging contaminants, which would normally involve lengthy researches, monitoring as well as discussions. The whole process might take a few years until the WHO finally provided guidance. **DEVB/WSD**

13. A Member expected that a new legislation would be necessary for the future final endorsement mechanism for the Standards. Mr Francis CHAU pointed out that the proposed interim endorsement mechanism was an interim measure to cater for any proposed changes to the Standards before the permanent arrangement was in place. If there was a new legislation on Drinking Water Safety in future, it would likely include the mechanism for endorsing changes to the Standards, and by then any proposed changes to the Standards would need to go through the necessary statutory procedures.

14. Although the proposed changes to the Standards would likely be technical, a Member pointed out that public consultation was normally conducted when setting or reviewing the drinking water quality standards in overseas jurisdictions. Hence, the Government might consider including public consultation in the interim endorsement mechanism. Another Member suggested that impact assessment to the trades, if any, should also be carried out for consultation with the trades affected.

15. The Chairman concluded that in-depth discussion on the item had been made

by Members and subject to the comments made, the proposed mechanism was endorsed by Members.

Agenda Item 4: Monitoring System for Assuring Drinking Water Quality
(DWSAC Paper No. 7/2018)

16. Mr Alex CHU, Assistant Secretary (Infrastructure Coordination) 2 of DEVB, briefed Members on the proposed approaches to monitor the performance of WSD in respect of drinking water safety, which included (1) examining the results of the WSD's water quality monitoring programme; (2) conducting audits on WSD's Drinking Water Quality Management System (DWQMS); and (3) monitoring the implementation of WSD's Water Quality Incident Management Plan (the Plan). To enhance transparency, annual summaries of the monitoring work would be published at DEVB's website.

17. In response to a Member's enquiry about the number of staff in DEVB's dedicated team and whether their qualifications could meet the requirements of the relevant tasks, Mr Alex CHU replied that three professionals from the fields of engineering and chemistry were working in the team led by a Team Leader to carry out the tasks. The workload and manpower requirement would be reviewed based on the outcome of the consultancy study on the regulatory regime.

18. A Member asked if the quarterly water quality reports submitted to the dedicated team under DEVB would be open for public information. Mr SW CHAU highlighted that the 12-month rolling water quality monitoring data were indeed updated half-yearly and published at WSD's website. In light of Member's recommendation, WSD might notify the public when update was made. **WSD**

19. A Member suggested the Government to consider setting up similar certification scheme for auditors of WSD's DWQMS which was adopted by some overseas countries. As for the Plan, another Member suggested WSD to revisit the categorization of the incidents with clear definition and demarcation of responsibilities. Members agreed that simpler categorization would be easier for the staff concerned to follow. Furthermore, the Plan should be reviewed and refined continuously to make it suitable for the Hong Kong context. Also, in order to enhance communication with other relevant parties, WSD might consider setting up criteria for notifying and engaging the relevant parties concerned, such as informing Environmental Protection Department for catchment incident. In addition, WSD might consider laying down a protocol for closing a water quality

incident. Furthermore, WSD might need to submit quarterly summary of incidents, regardless of their categories, to the DEVB's dedicated team for review. In response, Mr Byron LAM, Assistant Director/Task Group of WSD, explained the details of the Plan with examples of how various incidents were classified according to different levels of severity.

20. In response to a Member's enquiry regarding the content of annual summary reports by DEVB, Mr Alex CHU responded that, making reference to overseas, the regulatory body would provide in the annual report an overview of the drinking water safety and comment on the performance of water suppliers in carrying out their duties of assuring the water quality.

21. As to the suggestion of disclosing the categorization of incidents to the public, a Member opined that since the Plan was intended to be an internal procedural manual which covered immediate actions, post-incident follow-up works including root cause analysis and suggestion of improvement measures, disclosure of the Plan to the public was not recommended so as to avoid unnecessary confusion. In fact, the same practice was adopted by many local authorities or organizations.

22. Members in general showed appreciation for the Government's effort in assuring drinking water quality.

Agenda Item 5: Enhancement of Chlorination Facilities in Water Treatment Works
(DWSAC Paper No. 8/2018)

23. Mr Kelvin KWOK briefed Members on the enhancement work in Water Treatment Works (WTWs) to eliminate the risks associated with transportation and storage of liquid chlorine by installation of on-site chlorine generation (OSCG) plants at large WTWs to produce chlorine gas for pre-chlorination and disinfection in drinking water treatment. Since small-scale OSCG plant was not available in the market, sodium hypochlorite (NaOCl) solution produced by OSCG plants at large WTWs would be used for pre-chlorination and disinfection in drinking water treatment at small WTWs. Furthermore, WSD would purchase NaOCl solution to serve as backup (e.g. during installation and breakdown of the OSCG plants).

24. Mr Kelvin KWOK went on explaining that the major concern with the use of NaOCl solution in drinking water treatment was the formation of disinfection by-

products (DBPs), namely chlorite, chlorate, bromate and perchlorate. Particularly for chlorate, it might be a concern to those suffering from Glucose-6-phosphate dehydrogenase (G6PD) deficiency if its concentration in drinking water was high. He however assured that stringent control and monitoring measures would be put in place to ensure the quality of both the NaOCl solution and the final drinking water. Mr CL WONG added that a tight control for NaOCl solution would be exercised with a view to limiting the chlorate level in the drinking water to less than 300 μg/L which was much more stringent than the 700 μg/L value set in the WHO's Guidelines for Drinking-water Quality; and hence, WSD would not accept any batch of NaOCl solution if the estimated chlorate level in the drinking water after application would exceed 300 μg/L. Mr Kelvin KWOK supplemented that based on WSD's earlier study, a conservative approach had been adopted in predicting the chlorate level in the drinking water under real application of NaOCl solution for disinfection. Based on this study, the stringent target level of 300 μg/L for chlorate was set. In other words, the perceived actual chlorate level in the drinking water during the real application of NaOCL solution should be well below the 300μg/L target, thus ensuring that the treated water would be safe for consumption even for those suffering from G6PD deficiency.

25. Members noted and raised no comments on the enhancement of chlorination facilities in the WTWs in Hong Kong.

[Ir Peter WONG left at this juncture.]

26. A Member asked if WSD would consider other disinfection process to replace chlorination in long-term. Mr Kelvin KWOK replied that residual chlorine would be required for maintaining water quality along the water supply system and hence, there was no plan to replace chlorination with other disinfectants.

27. A Member suggested WSD to explore ways to recover for beneficial use of the hydrogen gas generated during the operation of the OSCG plants. Mr CK HON agreed that WSD should look into this issue. **WSD**

28. In response to a Member's enquiry regarding the consignment testing of NaOCl solution, Mr Kelvin KWOK answered that, apart from controlling the levels of DBPs, the pH value and heavy metal contents would also be tested for checking compliance with the specifications.

Agenda Item 6: Sharing after Visiting Singapore International Water Week 2018

29. The Government had sent representatives to attend the Singapore International Water Week (SIWW) 2018 held in early July 2018, and Mr Kelvin KWOK shared with Members a presentation on Contaminants of Emerging Concerns (CECs) which was one of the topics discussed in a workshop organised by the Water Convention in the SIWW. Members were briefed on the nature and categorisation of CECs as well as the technologies currently available for their removal.

30. A Member suggested WSD to consider working with local academics to conduct more research and development (R&D) projects in drinking water quality that were relevant to Hong Kong. Mr CK HON welcomed the suggestion as it was in line with the Government's commitment on promoting scientific researches and the development of innovation and technology, and said that funding had been made available for carrying out such R&D projects. Mr CL WONG supplemented that WSD had been collaborating with academics to carry out R&D projects including those on drinking water quality and would commission more such R&D projects in future.

31. A Member enquired if biologically active residues in raw water supplied from Dongjiang were being looked into. Mr Kelvin KWOK responded that WSD was conducting a consultancy study on the review of the Standards, and a watch list, which would include emerging contaminants such as microplastics and antibiotics, would be established for further evaluation of relevant parameters prior to consideration of including them into the Standards. **WSD**

Agenda Item 7: Summary on International Water Quality Incident

32. As briefly introduced in the Agenda Item 3 above about the radar service engaged by WSD, Mr Kelvin KWOK supplemented that WSD had introduced a two-tier radar system for the collection of information and handling of issues related to the emerging contaminants, viz. by WSD's internal "Radar Group" and a consultant. The Radar Group comprised Waterworks Chemists from the Water Science Division of WSD, who would search regularly information on water quality incidents from websites and literatures on a monthly basis. For the second-tier, a consultant was engaged in order to broaden the database in the review exercise and monthly updates on overseas drinking water quality incidents

and potential contaminants of emerging interest to the drinking water industry would be provided. Chief Chemist of WSD would vet the monthly reports and raise alarm and trigger follow up action if necessary. In general, the relevant findings would be brought forward for Members' discussion half-yearly.

33. Mr Kelvin KWOK further shared with Members a summary of international water quality incidents recorded during the period from June 2017 to April 2018. The incidents were classified into five hazard categories according to the nature of the causative agents. Mr Kelvin KWOK also presented a summary of lessons learnt from those incidents relevant to Hong Kong including the importance of carrying out risk assessment for each major operation, setting up of an incident management plan for dealing with urgent incidents requiring immediate responses and keeping consumers fully informed, etc.

34. The Chairman reminded Members to raise for discussion if they were aware of any international water quality incidents or issues that were of relevance.

Agenda Item 8: Any Other Business

35. A Member updated that the document regarding the development of drinking-water regulations and standards published by the WHO as mentioned in the last meeting was formally promulgated in early July 2018.

36. There being no other business, the meeting adjourned at 12:10 p.m.