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Response to [Public Consultation: Supply of Recycled Water In Hong Kong](#) from Civic Exchange

While the Hong Kong government has a long-established policy direction to conserve water and to develop a water supply structure with six different sources, the city's water consumption today still heavily relies on only three water "taps": Dongjiang water, local reservoirs and seawater. Infrastructure for developing alternative water sources, such as recycled water, remains as pilot projects and small-scale test sites.

Wastewater can make tremendous contribution to Hong Kong's future water security when it is recycled, treated and used in a "fit for purpose" manner. Civic Exchange welcomes the government's plan to begin deploying recycled water as one of the main water sources for Hong Kong; however, we would like to urge the government to be more entrepreneurial in the application of recycled water while exercising caution on the impact to public health – such caution should not be merely based on perception, but be founded in proper research and technology. Treating recycled wastewater to a drinkable standard can be an expensive alternative when compared to the use of freshwater for now. However, flushing should be just one of the many non-potable usage recycled water can take in Hong Kong. International experiences show that recycled water can be used for cleaning roads and vehicles, irrigating parks and sport fields, firefighting, industrial productions, landscaping, public fountains, cooling towers and many more.

We would also urge the government to develop a holistic water strategy with long-term vision and aspirational goals. This water blueprint, coupled with public engagement and policy support, will galvanise our society to join hands in conserving this precious resource and ensuring the sustainable development of our city.

The followings are our response and recommendations to the questions in the consultation:

Question 1: Do you agree to use recycled water in Hong Kong for non-potable applications only? If not, why?

Position: Agreed.

Justifications: As it currently stands, recycled water in Hong Kong faces two important hurdles before the public could consider it as acceptable for potable use. As mentioned in the consultation document, the 2008 public survey regarding the Ngong Ping Sewage Treatment Works (NPSTW)

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pilot scheme noted a 10% acceptance rate, which would indicate strong public opinions against (direct) potable use. While recycled water is an expensive alternative to potable water from fresh water sources at this point, it could be an economical replacement for non-potable water (pending the results of empirical research on this question). Wastewater should no longer be considered as a 'waste product' to be discarded, and it should instead be considered a 'resource' to tap into.

Recommendation: Recycled water can have value if used in a 'fit for purpose' manner – a view already espoused by the Government of Western Australia's Department of Health. Fit for purpose usage for non-potable applications can initially start with toilet flushing, landscaping, street cleaning, water for the fire department and moving onto for commercial laundry, car washing and so on.

Hong Kong should actively use education initiatives to inform the public on the merits of recycled water, which may lead consumers to fully accept reclaimed water for household use, as the technology matures and costs become competitive. For example, many downstream cities (including Shenzhen and Shanghai) today get their water from what upstream cities have already consumed. These facts should be integrated into public knowledge.

The last public survey that this consultation is based on was conducted some 10 years ago. The HKSARG should conduct another public opinion survey on the use of recycled water, and issue such public opinion surveys regularly – e.g. once every 3 years – to accurately and regularly gauge public opinion on this issue to inform policy design.

Question 2: Do you agree that the Government should supply recycled water for non-potable uses in lieu of fresh water to conserve precious water resource when opportunities arise and cost effective to do so? If not, why?

Position: Agreed.

Justifications: Water is a precious water resource and should be conserved. International experiences on the use of reclaimed water show that it could be used for cleaning roads and vehicles, irrigating parks and sport fields, flushing toilets, firefighting, industrial productions, urban development and landscaping, and public fountains.

Recommendation: The Hong Kong government should proactively explore initiatives to expand the supply of recycled water when it is cost-effective to do so, and if it is considered only for non-potable uses, then the applications should be considered for a wider set of applications.

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Question 3: Do you agree to use recycled water for flushing in lieu of saltwater in the existing saltwater supply zones if it is justified after consideration of the various factors, such as environmental impact, cost-effectiveness, etc? If not, why?

Position: Agreed.

Justifications: While seawater flushing has helped reduce fresh water consumption throughout the years, its continued long-term use presents several challenges. Due to its salt content, the corrosion of pipe infrastructure has increased the long-term maintenance cost of the seawater flushing system. According to HKSARG's Waterworks Operating Account documents, fresh water government mains depreciate on a 30-year schedule, while saltwater mains depreciate fully after 20 years, or 30% faster. This means that in the long-term, saltwater supply zones require much more frequent maintenance and therefore higher costs on a per unit basis.

Recommendation: The Hong Kong government should proactively identify initiatives to increase the supply of recycled water when it is cost-effective to do so.

Question 4: Do you agree to put in place legal provisions requiring collection and transmission of greywater in separation from sewage from water-closets, latrines, urinals, or similar fitments in buildings in designated areas to affect the subsequent production of recycled water by WSD, and impose penalty on a person who fails to comply with the legal provisions?

If affirmative, should penalty be imposed to:

- a) A person who carries out the works in contravention of the legal provisions; or
- b) A person who instructs the works in contravention of the legal provisions or
- c) Both of them?

If not, why?

Position: Agreed (Option C).

Justifications: Hong Kong's Water Pollution Control (Sewage) Regulation mandates the connection of works and structures of land and/or property to a communal sewer, for the purposes of transporting waste to a designated venue. Property owners are also responsible for maintaining these works. In the same vein, efforts to collect, separate, and reuse greywater should be governed under similar legal provisions.

Recommendation: Both the person carrying out these processes and the supervisor or management body should receive penalties if such provisions are not met.

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Question 5: Do you agree to have legal provisions to regulate and control the use of recycled water to be supplied by WSD, and impose penalties on contravention of such provisions (Eg intentional misuse of recycled water)? If not, why not?

Position: Agreed.

Justifications: As WSD plans to treat recycled water only up to standards fit for non-potable use at this time, it should therefore be used only in applications where it meets the applicable treatment standards (for 'fit for purpose' uses, as outlined in Q1) to ensure public health is adequately protected. WSD currently has regulations for the misuse of fresh water and seawater, so this would be in-line with current practices.

Recommendation: We strongly advise WSD to build sufficient flexibility into its regulatory regime to ensure that the expanded scope of usage of recycled water in the future would not be hampered.

Question 6: Do you agree to the addition of dye to recycled water (i.e. "colour-labelling") to be supplied by WSD, as an additional measure to prevent cross-connection between recycled water and fresh water supply systems and misuse of recycled water, which may limit to the major application in flushing only but not minor applications for other non-potable uses? If not, why?

Position: Provisionally Agreed.

Justification: Since full details of the exact dye addition are not yet known (i.e. effect on treatment; duration and frequency of use; effect on existing pipes), we provisionally agree to applying dye as colour-labelling. Periodic dye application for testing purposes can boost public confidence in Hong Kong's water system.

However, if WSD plans to provide recycled water that is treated to a high standard, and is suitable for non-potable uses beyond flushing, the addition of dye to the water would complicate its application to potential additional uses outlined in and beyond this consultation. Non-potable uses such as landscaping, construction dust suppression, firefighting, building cooling, and other commercial/industrial systems present ideal candidates for the expansion of recycled water to other uses, but are hampered by the addition of dyes which may stain or foul equipment. In addition to government properties and facilities, uses in non-residential sectors of the economy must be considered as potential major applications of recycled water as well. If these uses are not considered at the onset, additional costs may be incurred to modify the system.

There is also the potential that the addition of dye to non-potable water may negatively affect public perception of recycled water, making it more difficult to increase use in the future.

Recommendation: If WSD only wishes to provide non-potable water at flushing quality only, dye should still not be used as it can adversely affect toilet fixtures over time. Globally, plumbing codes seem to be moving away from colored water and focus on colored piping and equipment to prevent

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misuse. Looking to international examples, Australia and the Uniform plumbing code in the US have replaced dye coloring with pipe sizing and coloring.

Question 7: Notwithstanding Question 6, do you agree to the following non-potable uses of recycled water to be supplied by WSD without colour-labelling, for uses by Government departments to conserve fresh water resource in areas where the risks of cross-connection and/or misuse are minimal and appropriate preventive measures are in place? (A) Landscape Irrigation; (B) Street Cleansing; (C) Water Features; (D) Car Washing; and (E) Others (please specify). If affirmative, please select the relevant uses, and specify other uses in (E) when necessary. If not, why?

Position: Agreed.

Justifications: If WSD plans to provide recycled water that is treated to a high standard, and is suitable for non-potable uses beyond flushing, the addition of dye to the water would complicate its application to potential additional uses outlined in and beyond this consultation.

Recommendation: The WSD should consider recycled water for as many areas as possible to conserve fresh water resources for purely potable uses. In addition to irrigation, street cleaning, car washing, and water features, WSD should look at other potential applications, such as: fire hydrants/suppression systems, laundry (commercial and residential), pet/animal washing and feeding, and potentially reservoir recharge in dry seasons in the future dependent upon public acceptance and cost consideration. In addition to government departments, the WSD should consider allowing these applications in the commercial and industrial sectors as a start, to demonstrate its potential uses to help increase overall public acceptance rates.

Question 8: Do you agree that the WA should also be empowered with flexibility to permit non-potable uses of recycled water other than flushing when opportunities arise and the corresponding risks are under control, instead of effecting changes on the legislation from time to time? If not, why?

Position: Agreed.

Justifications: As the primary decision-making body on water-related matters in Hong Kong, the Water Authority should gain the flexibility to address multiple issues as they arise. These would include both risks and opportunities that should be dealt with on an individual case by case basis, rather than submitting legislative changes.

Recommendation: In lieu of proposing legislation for each possible use of recycle water, the WSO should consider source-neutral water quality standards dependent upon end use, instead of permitting each potential use by source. This would give the WSD flexibility to meet needs with the least expensive water that meets all relevant standards, minimizing risk to the end-users, ensuring that the water is fit for purpose regardless of the source.

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Question 9: Do you agree to the free-of-charge arrangement for the use of recycled water for flushing like that of the existing flushing supplies? If not, why?

Position: Disagreed.

Justification: As recycled water is a more expensive resource than seawater, it is imperative that the WSD follow the user-pays principle to ensure it recovers its costs, and that these higher costs do not result in the need for greater subsidies. In addition, not charging for recycled water may limit the ability to charge for it in the future and limit the ability to expand its use to other non-potable uses. By not charging for this resource in a similar way as fresh water has been charged, the public may develop a misplaced perception that recycled water is of low quality and it is not fit for other purposes.

Recommendation: WSD should consider charging for the use of recycled water, at a minimum, as they currently do for fresh water used for flushing.

Question 10: If the recycled water is permitted for non-potable uses other than flushing, do you agree that it should be charged? If not, why?

Position: Agreed.

Justifications: This is necessary to ensure public perception, education, and to build trust in recycled water as a water source. Charging for recycled water is necessary to ensure that usage is accompanied by fair payment and pricing.

Recommendation: It is imperative that WSD fully enforces the user pays principle, for both fresh water and seawater.

Question 11: Do you agree that the regulatory control by the existing legislations on the supply of recycled water by parties other than WSD is adequate? If not, should the regulatory control on the following aspects of the supply of recycled water by parties other than WSD be strengthened by legislation: (A) plumbing; or (B) water quality; or (C) use of recycled water or (D) any combination of (A), (B) and (C) (please specify)?

Position: Disagreed.

Justifications: Utilizing non-source specific standards will allow for a streamlining of existing legislations and consolidate the requirements for different end uses, which are based solely on quality standards, not by source. This will provide some needed flexibility for meeting demand needs in the future.

Recommendation: The WSD should remove legislation by source and replace it with non-source specific quality requirements.

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Question 12: Do you agree that amendments to legislation in relation to the supply of recycled water (including those pertinent to the supply by parties other than WSD if required) would not take retrospective effects? If not, why?

Position: Agreed.

Justifications: Grandfathering of existing systems is important to ensure private investment. Retroactive application of legislative changes should only occur in rare circumstances where public health would be affected.

Recommendation: If the WSD wishes to encourage private investment in recycled water, the retroactive application of amendments and standards may deter such investment.

For questions related to this submission, please contact our team at Civic Exchange.

Yours sincerely,



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