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WWF Hong Kong

香港中環纜車徑一號  
No.1 Tramway Path,  
Central, Hong Kong

電話 Tel: +852 2526 1011  
傳真 Fax: +852 2845 2764  
wwf@wwf.org.hk  
wwf.org.hk

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31 December 09

**WQO Review**  
**Environmental Protection Department**  
**Water Policy and Science Group**  
33/F Revenue Tower, 5 Gloucester Road  
Wanchai, Hong Kong  
(E-mail: [wqo\\_review@epd.gov.hk](mailto:wqo_review@epd.gov.hk))

**By E-MAIL only**

Dear Sir/Madam,

**Re: Review and Development of Marine Water Quality Objectives**  
**– First Stage Public Engagement Document**

WWF would like to express the following opinion on the captioned review exercise:

**[A] Views on the objective of the Review**

We welcome the review exercise and encourage EPD to conduct such an exercise regularly to cope with the latest research findings and changing public aspirations. Certainly there has been a major shift in public perception of the value of the sea in recent years.

We urge the Government to adopt a major objective that the review exercise should help the rehabilitation of our fisheries resources (not just maintenance of status quo) by significantly reducing the problem of pollution through revised marine water quality objectives (WQOs). This is not stated in the consultation document.

It is also our view that another key objective of the exercise should be to realise the public's vision of a healthy and clean marine environment with a clear ultimate goal and roadmap. As such, the second stage consultation should propose the long-term marine WQOs and the interim ones within a clear timeframe, the associated pollution control strategies including possible need for land use

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會長： 邵在德先生  
副會長： 鍾逸傑爵士  
楊成漢先生  
主席： 楊子信先生  
行政總裁： 龐毅理先生

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changes and cross-border collaboration, and the monitoring and response mechanisms to ensure that the strategies are effective

### **[B] Views on the key issues of Review**

WWF supports setting numerical standards for physical, nutrients and chemical parameters in accordance with international practices and taking into account the findings of latest scientific research.

Since it is well known that operation of fish culture zone can be a polluting source<sup>1</sup>, WWF views that the Government should consider setting new sets of physical, nutrients, chemical and microbiological criteria for fish culture zones. This will serve as a benchmark for setting appropriate policies and incentive measures to encourage fish culture zone operators to switch to environmentally friendly culture practices.

We also support developing and using biological criteria to directly assess the health of marine species from pollution impact. Two types of biological benchmark should be developed and used:

- a. The first type should look at the biological or physiological changes within individual species that qualify for detecting the acute and chronic toxicity of specific pollutants. We know that EPD has already introduced a biological indicator programme to find suitable biological parameters. One notable example of the many possible biological indicators being proposed is the degree of imposex in gastropods that can indicate the level of harm caused by Tributyltin contamination in marine water originating from the surface paint of vessels.
- b. The second type should look at the changes brought to the population, community and ecosystem processes of the marine environment. With reference to overseas examples such as Australia, these changes can be measured in terms of species richness, species diversity, species composition and structure, gross primary production and so on<sup>2</sup>. Statistical analyses should be conducted to check whether these ecological changes have a correlation with various physical, nutrient-related, chemical and micro-biological parameters<sup>3</sup>. We acknowledge the need to find a suitable reference site in applying this type of biological benchmark and hence it may not be easy. Nevertheless this type of benchmark is important in monitoring the actual ecological impacts from pollution.

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<sup>1</sup> Wu, R.S.S. 1995. The Environmental Impact of a Marine Fish Culture: Towards a Sustainable Future. *Marine Pollution Bulletin* 31 (4-12): 159-166.

<sup>2</sup> Reference is made to Table 8.1.1 of ANZECC and ARMCANZ. 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality: Volume 2 - Aquatic Ecosystems – Rationale and Background Information. Australian and New Zealand Environment and Conservation Council / Agriculture and Resource Management Council of Australian and New Zealand [http://www.mincos.gov.au/publications/australian\\_and\\_new\\_zealand\\_guidelines\\_for\\_fresh\\_and\\_marine\\_water\\_quality/volume\\_2](http://www.mincos.gov.au/publications/australian_and_new_zealand_guidelines_for_fresh_and_marine_water_quality/volume_2)

<sup>3</sup> *Ibid*

We believe that the government should review the existing boundaries of the water quality control zones since they were set in the 80s when the surrounding land uses of certain water quality control zones were significantly different from that today. The delineation of water quality control zones should reflect major differences in factors influencing marine water quality, in particular differences in **types of surrounding land uses** (and hence pollution sources), Pearl River discharge, water circulation, bathymetry and stratification.

We also consider the need to review the number and location of the existing monitoring stations so that they better reflect the overall water characteristics within each control zone.

- i. If a control zone has significant spatial variability of water characteristics, the number of stations needs to be raised to ensure the representativeness of the monitoring results.
- ii. The data collected from the monitoring stations in fixed locations is problematic statistically due to the potential confounding effects from different environmental variables, such as the characteristics of water current, distance from point source pollution, and water depth. WWF considers that setting the locations of monitoring stations should follow the method of stratified random sampling to take into account the problem of great spatial variability within each control zone. This basically means dividing each control zone into several sub-zones and deploying a certain number of stations randomly within each sub-zone. This method is particularly applicable to situations like Inner Deep Bay versus Outer Deep Bay mouth within the Deep Bay control zone and coastal areas versus off-shore waters within every control zone.
- iii. EPD should also ensure that sub-zones containing habitats or species of high conservation value<sup>4</sup> would have more monitoring stations than sub-zones which could be less ecologically sensitive such as those used for navigation or those containing man-made seawalls with multiple sewage discharge points.

We also consider that the Hong Kong Government should gain consensus from the Shenzhen Government and explain to the Hong Kong public the detailed 2007 review result of the Deep Bay (Shenzhen Bay) Water Pollution Control Joint Implementation Programme that was drafted jointly with Guangdong in 2000<sup>5</sup>. It should also explain to the public in detail how the latest water pollution reduction targets were set<sup>6</sup> including the justifications and the constraints. Currently, areas of high conservation value and oyster culture zones in Inner Deep Bay are seriously threatened by

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<sup>4</sup> See "Section C Views on the beneficial uses and sensitive receivers" in this comment

<sup>5</sup> See Section "Pearl River Delta Regional Water Quality Management Cooperation" in EPD's website:

[http://www.epd.gov.hk/epd/english/environmentinhk/water/water\\_maincontent.html](http://www.epd.gov.hk/epd/english/environmentinhk/water/water_maincontent.html)

See also paragraph 16 of a Legco paper titled "Environmental Co-operation between Hong Kong and Guangdong" prepared by EPD [http://www.epd.gov.hk/epd/english/news\\_events/legco/files/EA\\_Panel\\_090715c\\_eng.pdf](http://www.epd.gov.hk/epd/english/news_events/legco/files/EA_Panel_090715c_eng.pdf)

<sup>6</sup> See EPD so-called achievements during the cross-boundary cooperation on Deep Bay Water Quality Protection [http://www.epd.gov.hk/epd/wqo\\_review/en/pdf/deep\\_bay\\_eng.pdf](http://www.epd.gov.hk/epd/wqo_review/en/pdf/deep_bay_eng.pdf)

continued water quality deterioration, however key stakeholders such as WWF and fishermen have never been consulted nor explained to about the workings of the Joint Implementation Programme. We are particularly frustrated by the fact that even if the latest pollution load targets for Biochemical Oxygen Demand, Total Nitrogen and Total Phosphorus set up under the Joint Implementation Programme are met, the pollution load entering Deep Bay would still be significantly higher than the projected carrying capacity of the Deep Bay. This reflects a major need for the Hong Kong Government to explain why such unambitiously low targets were set and whether they have exhausted all technically feasible strategies and measures to reduce the pollution load. It should be borne in mind that an internationally important RAMSAR wetland site, an Important Bird Area (Birdlife International designation), a Shorebird and Anatidae Network Site, SSSI, and pockets of ecological important wetland areas within Inner Deep Bay will be directly affected by any pollution discharge from the catchment on both Shenzhen and Hong Kong sides. The consistently low compliance rate of water quality in Deep Bay over the past two decades<sup>7</sup> and the anticipated failure to control pollutant levels below the assimilative capacity in the next 10 years is unacceptable and warrants drastic action to stop the deteriorating trend.

### **[C] Views on the beneficial uses and sensitive receivers**

WWF views that due to rising demand for marine conservation, EPD should consider establishing new sets of MWQOs for marine parks and marine reserves, sites of special scientific interest (e.g. Inner Deep Bay), and nursery and spawning grounds of fisheries resources.

The revised MWQOs should also recognise the following species and habitats as water sensitive receivers and offer adequate protection to them in the revision:

- a. Natural coastal habitats (e.g. mudflats, sandy shore, rocky shore, mangroves, etc)
- b. All ecological important marine species such as coral communities, Chinese white dolphins, Finless porpoises, Green turtles, seagrass and 'living fossils' horseshoe crabs.
- c. Marine protected areas and ecological important areas such as those mentioned in the previous paragraph.
- d. There is no doubt that fish should be a sensitive receiver since it is a key component of the marine ecosystem and the operation of the whole fisheries industry relies on its diversity and abundance which however are heavily impacted by pollution from the many beneficial uses in a cumulative manner in Hong Kong.

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<sup>7</sup> "WQO compliance rates in the Deep Bay WCZ over the past two decades have consistently been below 50%. In 2005, the overall compliance rate for the Deep Bay WCZ was just 33%. The entire WCZ failed to meet the total inorganic nitrogen (TIN) objective, and the two innermost stations in the bay also failed to comply with the dissolved oxygen objective. Unionised ammonia, which is toxic to marine organisms, was also recorded at above WQO levels except in the outer reaches of the bay." (Quoted from the EPD report titled "20 Years of Marine Water Quality Monitoring in Hong Kong 1985-2005" )  
[http://www.epd.gov.hk/epd/misc/marine\\_quality/1986-2005/textonly/eng/08\\_western.htm](http://www.epd.gov.hk/epd/misc/marine_quality/1986-2005/textonly/eng/08_western.htm)

### **[D] Types of WQOs or parameters that should be considered**

EPD should also set specific reduction targets of marine floating refuse as a new WQO. Marine quality is not only impacted by sewage and pollutants but also affected by floating rubbish that is dumped or drifted to sea from nearby areas every day. Currently Marine Department is one of the departments responsible for rubbish collection depending on whether it is at sea, on beaches and whether the latter are gazetted, un-gazetted or marine parks. Although there is a distinction on solid waste as opposed to chemical waste, this becomes irrelevant when the solid waste decomposes/breaks down and affects the sea and the organisms in it. The lack of coordination between EPD, Marine Department and other responsible agencies results in large amounts of rubbish floating on the sea for months or years.

### **[E] Views on Review approaches**

In setting WQOs for natural parameters, the government stated that "... *'the Reference Site Approach' is commonly adopted for development the numerical values concerned. The approach is to generate required values at measurement sites for each natural parameter, based on at least two years' data at a corresponding reference site, which has similar or the same biological make-up as the water body for which the WQO is to be established ... Any site selected for reference purpose should be unimpaired or minimally impaired*"<sup>8</sup>. However, WWF acknowledges the importance of finding a reference site for setting marine WQOs but we are concerned about how to locate the reference site for each of the western, transition and eastern waters scientifically. For example, most western water of Hong Kong is heavily degraded by pollutants from the estuary and from effluent disposal, spoil disposal, marine fill borrowing and navigation vessels. It is difficult to find a reference site with two years of data for western water. The same is also true for transition waters. It is important to clarify this because, as stated in section A of this comment above, the revised Marine WQOs should serve as a benchmark that can trigger major actions to reduce pollution significantly so as to contribute to fisheries rehabilitation. WWF considers that the "Reference Site Approach" should not be used to justify maintaining the status quo of our existing marine WQOs when we are supposed to aim for more stringent standards.

The government should also clarify why it proposes to apply the "risk assessment approach" to protect at least 80% of the species but not 99%, 95% or 90% as commonly adopted by other countries using a similar approach<sup>9</sup>. According to section 4.2.4 of the Technical Note provided for this consultation, 80% is set for heavily modified ecosystems. If the Government does intend to correct the course of worsening marine pollution in Hong Kong and help fisheries resources thrive

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<sup>8</sup> Page 11 of the First Stage Public Engagement Document

<sup>9</sup> Page 11 and page 15 of the First Stage Public Engagement Document

back, it should treasure the opportunity of setting more stringent MWQOs, in particular for the areas important for marine conservation (see [C] above).

Thank you for your attention to the captioned matter. We look forward to hearing from you.

Yours faithfully,

A handwritten signature in blue ink, appearing to read "Alan" followed by a stylized flourish.

Alan Leung, Ph.D  
Senior Conservation Officer