

**LOCAL VESSELS ADVISORY COMMITTEE
PILOTAGE ADVISORY COMMITTEE**

**Pilot Deployment of Real-time Hydrographic and Water Quality
Monitoring Station off North Point**

Purpose

Members are invited to note the Annex containing a paper issued by the Environmental Protection Department concerning the captioned matter.

Marine Department
April 2023

**Pilot Deployment of Real-time Hydrographic and Water Quality
Monitoring Station off North Point**

Purpose

Members are invited to note the details of the pilot deployment of a real-time hydrographic monitoring station off North Point as set out in this information paper.

Background

2. To enhance the government's capability in water quality management, the Environmental Protection Department (EPD) has installed two scientific buoys, one off Tsuen Wan Park and one in the north Lantau waters, to monitor the hydrographic/water quality conditions there. The EPD plans to install a third buoy off North Point in Victoria Harbour to monitor the hydrographic and water quality conditions in this important water body of Hong Kong, from which valuable reference information can be obtained to better understand the water quality variation in relationship to tidal flow to and from the harbour area.

3. The EPD will launch a 2-year pilot scheme tentatively in the second quarter of 2023 to deploy a real-time hydrographic and water quality monitoring system mounted on a new tailor-made scientific buoy off North Point for measuring flow speed and direction in the water column, and a few key water quality parameters. Data obtained from the system will be used to support EPD's planned development of near real-time pollutant transport modelling.

Proposal

4. The proposed real-time hydrographic monitoring station in the form of a scientific buoy will be placed at 22°17.647' N 114°11.614' E, which is about 180m from the shoreline and about 150m from the navigation channel. The proposed location and the schematic diagram of the real-time hydrographic monitoring station are shown in **Appendices A and B**.

5. The proposed scientific buoy comprises three main components including scientific instruments for measurement and sensing; communication and data transmitting equipment; and a power unit to harness and store solar

energy. The system is self-contained and running automatically to conduct real-time monitoring of hydrographic and water quality conditions. No discharge will be generated during the operation of monitoring system as the analyses will be carried out acoustically and optically with no chemical reaction involved.

6. The sensing instruments include an Acoustic Doppler Current Profiler (ADCP) that will be deployed on the sea-bed for measurement of sea current and wave data; two multiparameter sensors hanging below the buoy for monitoring the physical properties of sea water and the water quality status; and a camera module for capturing the conditions of the surrounding environment.

7. The scientific buoy is designed with a diameter of 3m and focal height of 3.7m (**Appendix C**). Safety features include lights, top mark, signs, radar reflector and automatic identification system. The scientific buoy is designed in compliance with the specifications and requirements of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guideline No. 1099 on the Hydrostatic design of buoys (Edition 1 May 2013) published by the IALA. According to the Navguide 2018 Marine Aids to Navigation Manual (8th Edition) published by the IALA, the minimum length of mooring chains should be at least two times of the water depth. For the water depth of about 9m, two mooring chains each of about 25m long will be connected to two 10 tonne concrete block sinker for anchoring the scientific buoy. The particulars of the scientific buoy are as follows:

Name	: EPD-3
Position (WGS 84 Datum)	: 22°17.647' N 114°11.614' E
Shape	: Pillar
Colour	: Yellow
Light Characteristics	: Fl (5) Y.20s
Top Mark	: Yellow "X"
Radar Reflector	: Fitted
Automatic Identification System	: Fitted

8. The position of the scientific buoy will be monitored by on-board GPS device in real time. For any drift of the buoy more than 40m from its original position, the contractor will perform inspection and relocate the buoy back to its original position within 1 day if the weather allows. The light of the buoy will be closely monitored 24 hours online via remote terminals and mobile phones. During the early phase of deployment, inspections once per week should be arranged. Afterwards, routine maintenance needs to be conducted on a bimonthly basis.

9. Upon completion of the 2-year pilot scheme, EPD will review its further deployment afterwards.

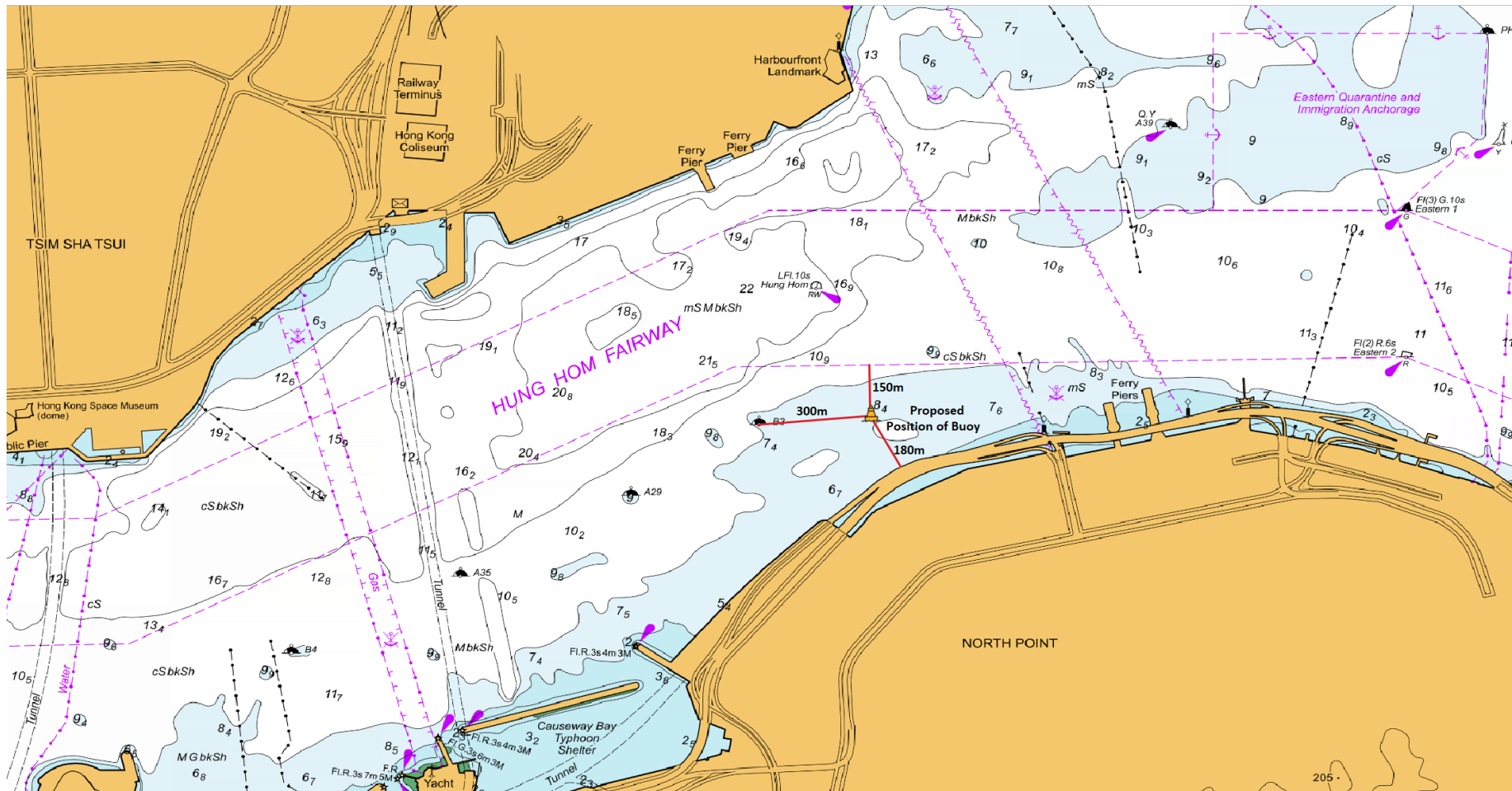
Way Forward

10. EPD will liaise with the Marine Department for the installation of the scientific buoy off North Point.

11. Members are invited to note the details of the proposal described in paragraphs 4 to 9 above. In case of any enquiry on the related matters, please contact Dr. WONG Tse Man, Ken of EPD by phone at 2594 6542, or by email: kentmwong@epd.gov.hk. For matters regarding the 24 hours maintenance of the scientific buoy, please contact Mr. CHAN Lawrence of Sha Tau Kok Marine Innotech Circle Ltd. by phone at 9872 9175.

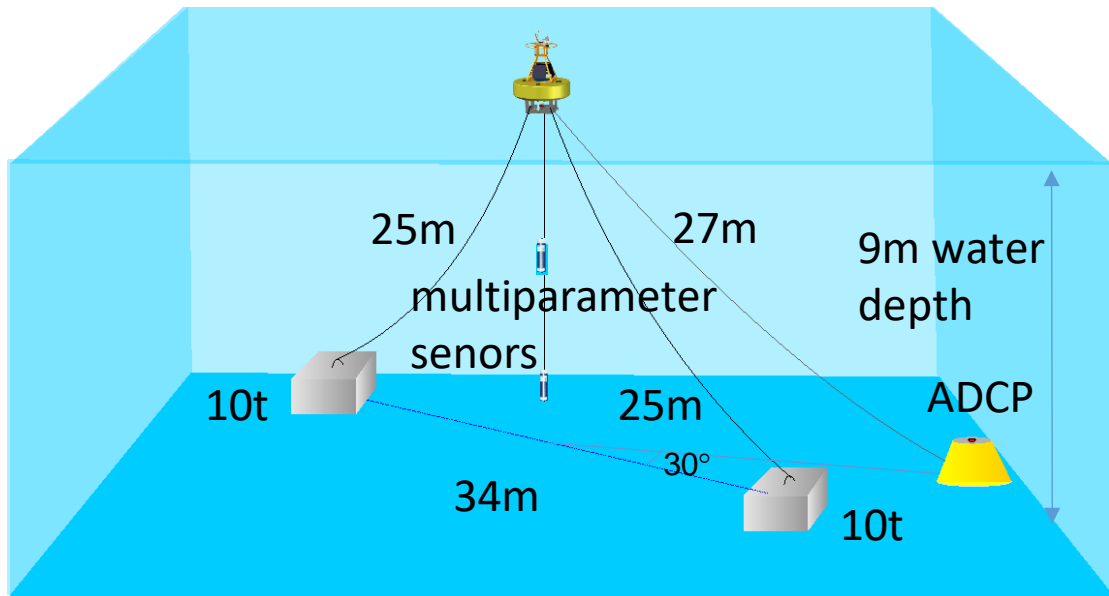
Water Quality Management Group
Environmental Protection Department
April 2023

Location of the proposed real-time hydrographic and water quality monitoring station

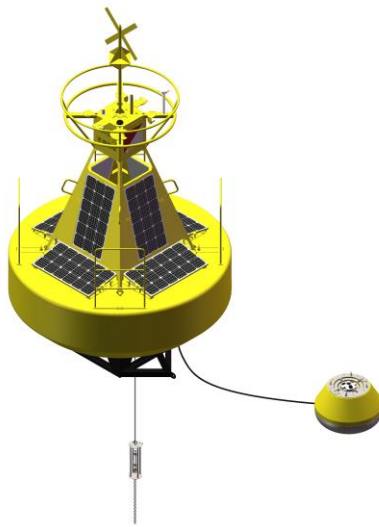


Position: (WGS 84 Datum)

Schematic diagram of real-time hydrographic and water quality monitoring station deployment



Design of the scientific buoy



Dimension and components of buoy

