

Local Vessels Advisory Committee

**Pilot Deployment of Real-time Hydrographic Monitoring Station
in North Lantau Waters**

Purpose

Members are invited to refer to the Annex for perusal of a paper concerning the captioned matter, and submit any comments on the paper by replying to the Secretariat on or before 13 September 2021.

Marine Department
30 August 2021

**Pilot Deployment of Real-time Hydrographic Monitoring Station
in North Lantau Waters**

Purpose

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

Background

2. To enhance the government's capability in water quality management, the Environmental Protection Department (EPD) plans to install a scientific buoy in the north Lantau waters to monitor the hydrographic conditions there, from which valuable reference information can be obtained to better understand the Pearl River flow entering Hong Kong and the consequential impact to the water quality in Hong Kong waters.

3. The EPD will launch a 2-year pilot scheme tentatively in the fourth quarter of 2021 to deploy a real-time hydrographic monitoring system mounted on a new tailor-made scientific buoy in the north Lantau waters for measuring flow speed and direction in the water column. 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°20.370' N 114°0.154' E, which is about 400m outside the boundary of The Brothers Marine Park and about 200m away from the nearest submarine cables. 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 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. The performance of the buoy will be closely monitored via remote terminals and mobile phones. During the early phase of deployment, more frequent inspections (up to once per week) may be arranged if necessary. Afterwards, routine maintenance needs to be conducted on a quarterly basis.

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 Conductivity-Temperature-Depth (CTD) sensors hanging below the buoy for monitoring the physical properties of sea water; 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 two times of the water depth. For the water depth of about 17m, two mooring chains each of about 43m 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-2
Position (WGS 84 Datum)	: 22°20.370' N 114°0.154' 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 60m 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.

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

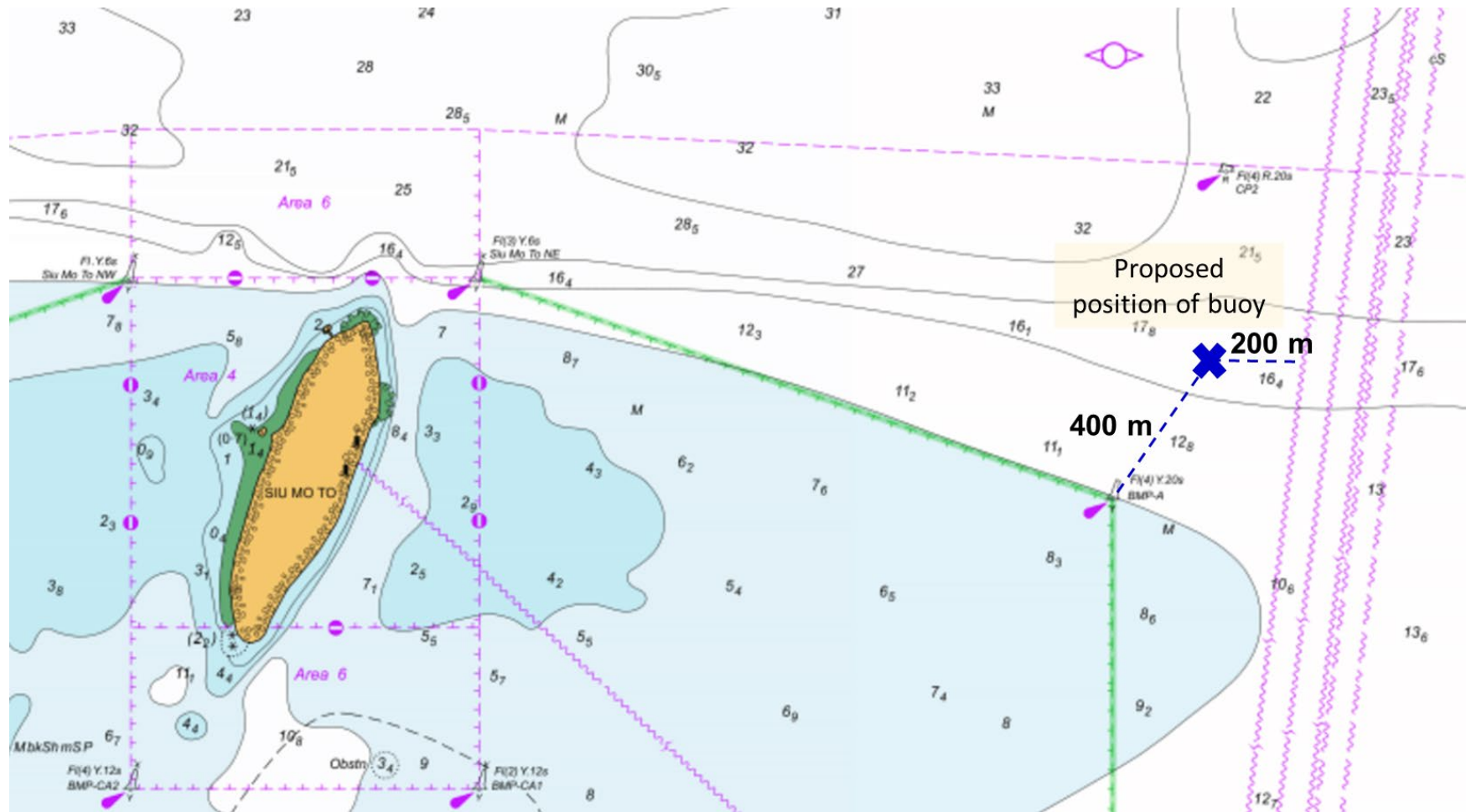
Way Forward

10. EPD will liaise with the Marine Department for the installation of the scientific buoy in north Lantau waters.

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. LIU Cham Chuen, Ben of EPD by phone at [2594 6531](tel:25946531), or by email: ccliu@epd.gov.hk.

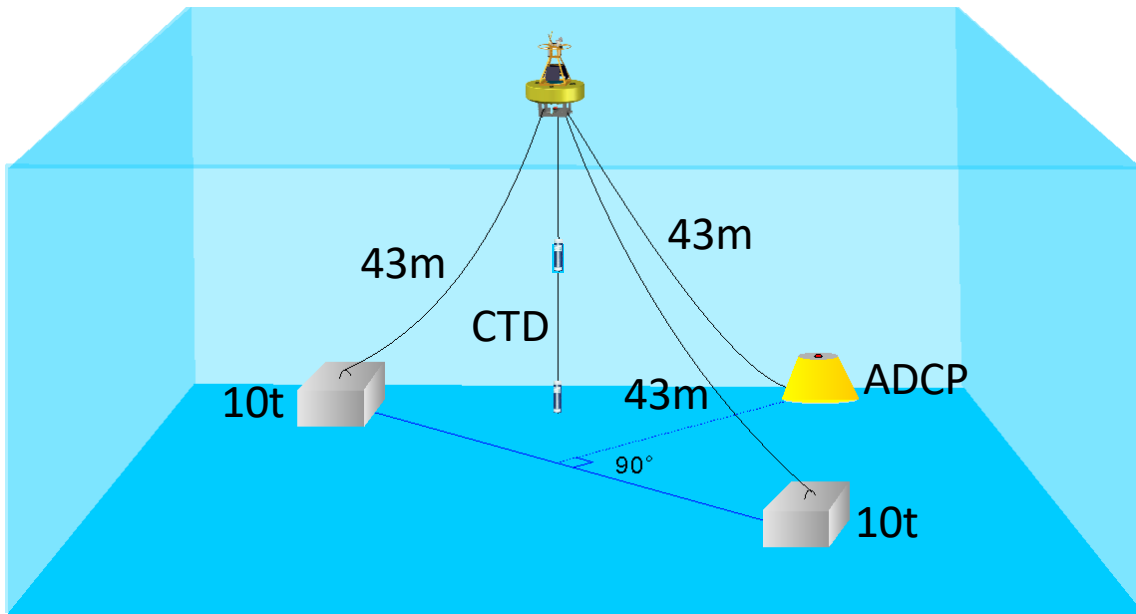
Water Policy and Science Group
Environmental Protection Department
August 2021

Location of the proposed real-time hydrographic monitoring station

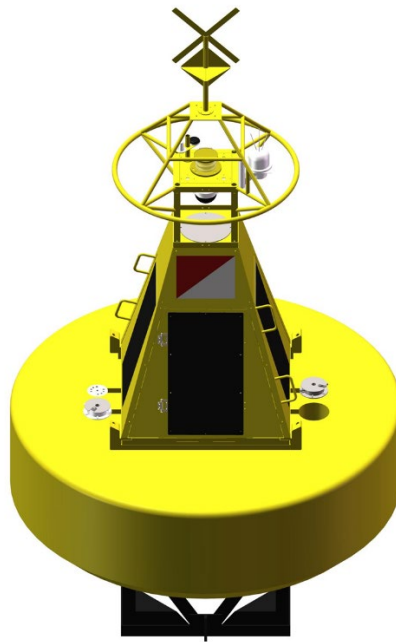


Position: 22°20.370'N 114°0.154'E (WGS 84 Datum)

**Schematic diagram
of real-time hydrographic monitoring station deployment**



Design of the scientific buoy



Dimension and components of buoy

