AJC JOINT VENTURE

By Post & Email

The EIA Ordinance Register Office,
Environmental Protection Department,
27th floor, Southorn Centre,
130 Hennessy Road,
Wanchai, Hong Kong

Ref.: AJC/EPD/210001

Date: 7 January 2021

Attn.: Miss Tiffany Cheung

Dear Madam,

RE: CONTRACT NO.: 13/WSD/17
DESIGN, BUILD AND OPERATE FIRST STAGE OF TSEUNG KWAN O DESALINATION PLANT
Addendum to Silt Curtain Deployment Plan (EP Condition 2.10) – Updated Silt Curtain Efficiency Test Plan

As a result of the latest work programme development, the implementation schedule of the silt curtain efficiency test requires adjustment that the test will be carried out at marine outfall instead of the seawater intake location. In effect, the monitoring stations would be relocated while the approved efficiency test procedure shall remain unchanged.

Attached please find the addendum of updated Silt Curtain Efficiency Test Plan together with the respective ETL's certification and IEC's verification letters for the Authority's approval.

Should you have any enquiry, please do not hesitate to contact our Environmental Monitoring Manager, Brian Kam at 9456 9541.

Thank you for your attention.

Yours faithfully
For and on behalf of AJC Joint Venture

Stephen Yeung
Project Manager

SY/SP/LW/BK/sk

Encl.
- ETL's Certification Letter
- IEC's Verification Letter
- Addendum of updated Silt Curtain Efficiency Test Plan

c.c.: Black & Veatch Hong Kong Limited – Ms. Christina Ko (By Email)
Black & Veatch Hong Kong Limited – Mr. Roger Wu (By Email)
ANewR Consulting Limited – Mr. Adi Lee (IEC) (By Email)
Acuity Sustainability Consulting Limited – Jacky Leung (ET) (By Email)

CDX/LT/ER5/2021/1239

AJC Joint Venture
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Our Ref. : L202101006
Date : 6 January 2021

By Email

AJC Joint Venture
5/F, Tower A, Manulife Financial Centre,
223-231 Wai Yip Street,
Kwun Tong, Kowloon, Hong Kong
Attn: Mr. Brian Kam (Environmental Monitoring Manager)

Dear Mr. Kam,

Contract No. 13/WSD/17
Design, Build and Operate First Stage of Tseung Kwan O Desalination Plant
Updated Monitoring Locations and Layout of Silt Curtain Efficiency Test

I refer to the updated monitoring locations and layout of silt curtain efficiency test issued on 4 January 2021. In view of the no objection of EPD on the proposing of carrying out the silt curtain efficiency test at marine outfall, where the first dredging work would be taken place, please note that we herewith certify the captioned update on top of the Section 5 of the approved Silt Curtain Deployment Plan submitted in October 2020 in accordance with Condition 2.10 of Environmental Permit EP-503/2015/A and Further Environmental Permit FEP-01/503/2015/A.

Should you have any queries, please do not hesitate to contact the undersigned at 2698 6833.

Yours faithfully,

For and on behalf of
Acuity Sustainability Consulting Limited

Jacky Leung
Environmental Team Leader

ANEWR

Water Supplies Department
New Works Branch
Consultants Management Division
6/F Sha Tin Government Offices
1 Sheung Wo Che Road
Sha Tin
New Territories

Your reference:

Our reference: HKWSD202/50/106988

Date: 7 January 2021

Attention: Mr W K Lau

BY EMAIL & POST
(email: simon_wk_lau@wsd.gov.hk)

Dear Sirs

Agreement No. CE 5/2019 (EP)
Independent Environmental Checker for First Stage of
Tseung Kwan O Desalination Plant– Investigation
Verification of Updated Silt Curtain Efficiency Test Plan

We refer to email of 4 January 2021 attaching an updated Silt Curtain Efficiency Test Plan for the captioned project prepared by the AJC Joint Venture.

We have no further comment and hereby verify the updated Silt Curtain Efficiency Test Plan in accordance with Clause 2.10 of the Environmental Permit no. EP-503/2015/A and the Further Environmental Permit no. FEP-01/503/2015/A.

Should you have any queries regarding the above, please do not hesitate to contact the undersigned or our Ms Reasonlie Cheung on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

Adi Lee
Independent Environmental Checker

LYMA/CYYR/lsmt

ANewR Consulting Limited
Unit 517, 5/F, Tower A, Regent Centre
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ISO 9001 : 2015
Certificate No.: CC 3988

5. Silt Curtain Efficiency Test Plan

Reference is made to EMIS and Annex C of the EM&A Manual that a pilot test for silt removal efficiency of the combined use of single layer of floating type silt curtain and a cage type silt curtain would be conducted during the first carrying out of dredging work. Given short period of dredging for inconsiderable dredging volume is anticipated, a small-scale efficiency test would be proposed on the first two days of dredging.

5.1 Monitoring Locations

The monitoring locations would be determined based upon the locations of dredging activities and safe distance from the working grab or plant. Three (3) sets of monitoring stations would be arranged, comprising both Impact zone and Outer zone of the silt curtain as well as upstream control stations for impact water quality monitoring. The locations of the sampling station are described in Table 5.1 and depicted in Figure 5.1.

Station ID	Description	Coordinates*
In'	Impact zone – area enclosed by both layers of silt curtains	E: 846697 N: 813765
Oe'	Outer zone – downstream location of ebb tide at approximately 100m from the dredging area	E: 846749 N: 813851
Of'	Outer zone – downstream location of flood tide at approximately 100m from the dredging area	E: 846645 N: 813680
Ce	Upstream control station during ebb tide	E: 845800 N: 814110
Cf	Upstream control station during flood tide	E: 848910 N: 813340

* Subject to adjustment according to site activities and situations

Table 5.1 – Monitoring Stations for the Silt Curtain Efficiency Testing

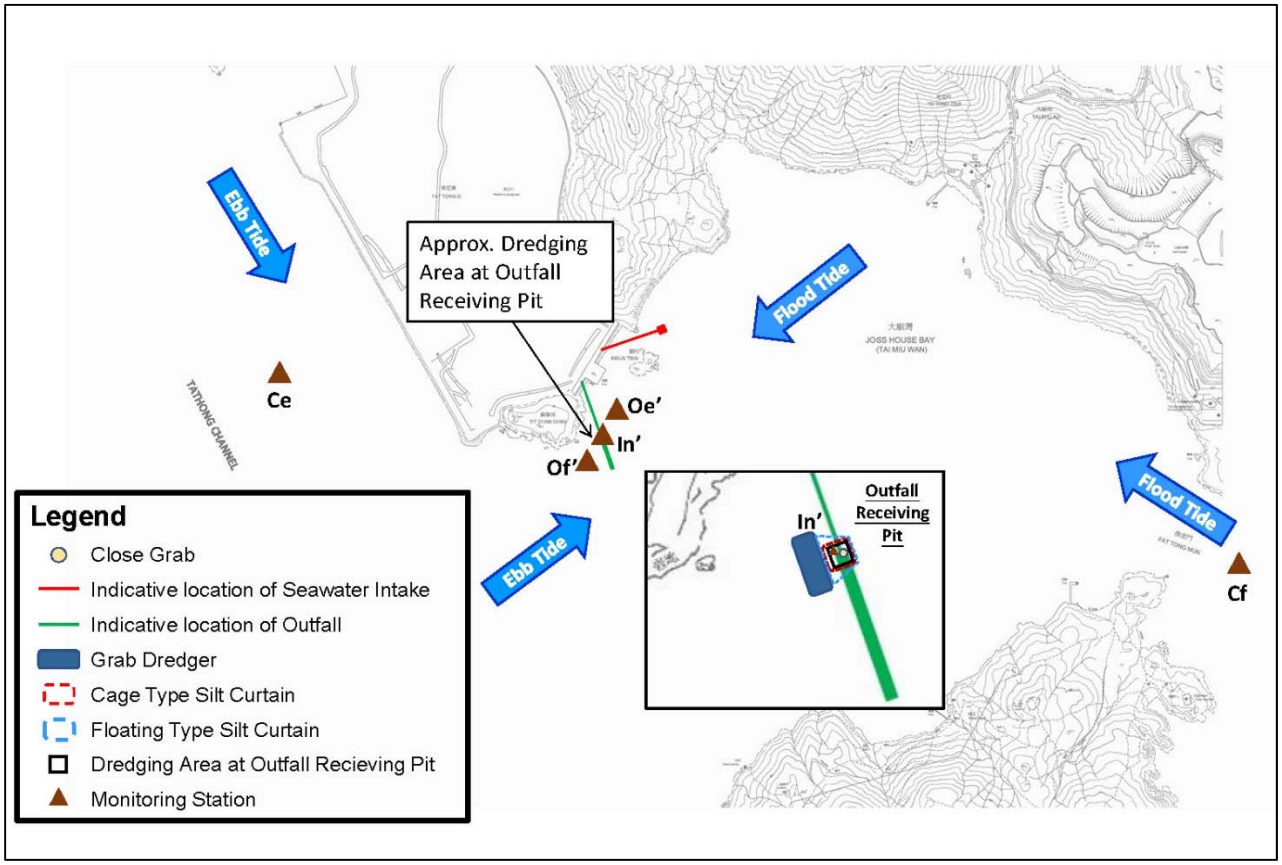

Figure 5.1 – Monitoring Stations of Silt Curtain Efficiency Testing

5.2 Monitoring Parameters

The parameters selected for measurement *in situ* and in the laboratory are those recommended in the EIA Report that could be affected by the dredging work and other general water quality parameters. Suspended solid would be measured in the laboratory for silt curtain efficiency evaluation. The water quality parameters to be measured are tabulated in Table 5.2.

Water Quality Parameter	Measurement Type
Suspended Solids	Laboratory analysis
Turbidity	*In-situ*
Dissolved Oxygen	*In-situ*
Salinity	*In-situ*
Temperature	*In-situ*

Table 5.2 – Water Quality Parameters to be Measured

In addition to the water quality parameters, other relevant data, including the locations of sampling locations, water depth, time, weather conditions, sea conditions, tidal stage, current direction and velocity would also be measured and logged. Specific observations and work activities undertaken around the monitoring and works area that may influence the monitoring results should be recorded.

5.3 Monitoring Equipment

- ***Dissolved Oxygen and Temperature Measuring Equipment*** - The instrument will be a portable, weatherproof dissolved oxygen measuring instrument complete with cable, sensor, comprehensive operation manuals, and will be operable from a DC power source. It will be capable of measuring: dissolved oxygen levels in the range of 0 - 20 mg/L and 0 - 200% saturation; and a temperature of 0 - 45 degrees Celsius. It shall have a membrane electrode with automatic temperature compensation complete with a cable of not less than 35 m in length. Sufficient stocks of spare electrodes and cables shall be available for replacement where necessary (e.g. YSI model 59 DO meter, YSI 5739 probe, YSI 5795A submersible stirrer with reel and cable or an approved similar instrument).

- ***Turbidity Measurement Equipment*** - The instrument will be a portable, weatherproof turbidity-measuring unit complete with cable, sensor and comprehensive operation manuals. The equipment will be operated from a DC power source, it will have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU and will be complete with a cable with at least 35 m in length (for example Hach 2100P or an approved similar instrument).

- ***Salinity Measurement Instrument*** - A portable salinometer capable of measuring salinity in the range of 0 - 40 ppt will be provided for measuring salinity of the water at each monitoring location.

- ***Water Depth Gauge*** – A portable, battery-operated echo sounder (for example Seafarer 700 or a similar approved instrument) will be used for the determination of water depth at each designated monitoring station. This unit will preferably be affixed to the bottom of the work boat if the same vessel is to be used throughout the monitoring period.

- ***Current Velocity and Direction*** – A current meter capable of measuring the velocity and direction of flow in the range of 0 – 6 m/s (± 0.01 m/s) and 0° to 360° (± 2°), respectively, will be used (e.g. Falmouth Scientific, Inc. 2-Dimensional Acoustic Current Meter or a similar approved instrument).

- ***Positioning Device*** – A Differential Global Positioning System (DGPS) shall be used during monitoring to allow accurate recording of the position of the monitoring vessel before taking measurements. The DGPS should be suitably calibrated at appropriate checkpoint to verify that the monitoring station is at the correct position before the water quality monitoring commences.

- ***Water Sampling Equipment*** - A water sampler, consisting of a PVC or glass cylinder of not less than two litres, which can be effectively sealed with cups at both ends, will be used (e.g. Kahlsico Water Sampler 13SWB203 or an approved similar instrument). The water sampler will have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.

Prior to the Pilot Tests, the valid calibration certificates of the monitoring equipment to be used in situ will be provided to the SOR, the ET, and IEC for agreement. All valid calibration certificates will be attached to the monitoring report.

5.4 Sampling/ Testing Protocols

All *in situ* monitoring instruments will be checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use. Responses of sensors and electrodes will be checked with certified standard solutions before each use.

On-site calibration of field equipment shall follow the *"Guide to On-Site Test Methods for the Analysis of Waters"*, BS 1427: 2009. Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when equipment is under maintenance, calibration etc.

5.5 Laboratory Measurement and Analysis

All laboratory work shall be carried out in a HOKLAS accredited laboratory. Water samples of about 1,000 mL shall be collected at the monitoring and control stations for carrying out the laboratory analyses. Water samples for SS measurements will be collected in high density polythene bottles, packed in ice (cooled to 4° C without being frozen), and delivered to a HOKLAS laboratory as soon as possible after collection.

The determination work shall start within the next working day after collection of the water samples. The SS laboratory measurements shall be provided to the client within 7 working days upon the receipt of the samples. The analyses shall follow the standard methods as described in APHA Standard Methods for the Examination of Water and Wastewater, 19th Edition, unless otherwise specified (APHA 2540D for SS) with a detection limit of 0.5 mg/ L.

5.6 Sampling Depths and Replication

Unless otherwise specified, each station will be sampled and measurements will be taken at three depths, 1 m below sea surface, mid-depth and 1 m above the seabed. Duplicate (2) readings of the *in situ* measurements and duplicate (2) SS samples will be made at each water depth at each station. For stations that are less than 3 m in depth and the Impact zone (In') station where the water column inside dredging zone would be readily mixed, only the mid depth sample will be taken. For stations that are less than 6 m in depth, the mid-depth station will be omitted. As the QA/QC procedures for

the in-situ measurement of DO and Turbidity, where the difference in value between the first and subsequent measurements at a certain depth is more than 25% of the value of the first measurement, the measurements should be discarded and further measurements should be taken to confirm the values.

5.7 Monitoring Frequency and Arrangements

Monitoring will be conducted at all designated stations on the day with dredging work. The monitoring will be conducted at an interval of two hour throughout the day. A total of 7 sampling event will be conducted. The first monitoring event should be conducted right before the dredging event to serve as a baseline condition.

Time	Monitoring	Stations	Sample Quantities	Duration
Day 1				
14:00	Baseline	In', Ce, Oe', Cf, Of'	2 replicates x (3 depths 5 stations = 30	Prior to impact monitoring when no dredging work is carried out
Day 2				
08:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	First impact sampling event
10:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	After 2 hrs from the previous sampling event
12:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	After 2 hrs from the previous sampling event
14:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	After 2 hrs from the previous sampling event
16:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	After 2 hrs from the previous sampling event
18:00	Impact	(In'#, Ce, Oe') OR (In'#, Cf, Of')*	2 replicates x (3 depths x 2 stations + 1 depth x 1 station) = 14	After 2 hrs from the previous sampling event

During dredging operation at the receiving pit, the whole water column inside the enveloped impact station would be readily mixed thus one mid-depth sample would be considered representative. Safety considerations were also taken to minimize the duration of the sampling technician who would stay close to the dredging grab.
* Only monitoring stations at the corresponding tide would be required. For instance, only the impact station (In'), control stations for ebb tide (Ce) and outer station for ebb tide (Oe') would be required for an ebb tide condition.

5.8 Evaluation of Loss Reduction Factor

The efficiency of the silt curtains will be evaluated against the relevant loss reduction factor for suspended solids, using the following equation.

$$(SS_{inside} - SS_{outside}) / SS_{inside} \times 100\%$$

5.9 Reporting of Evaluation Results

The monitoring results and respective evaluation of loss reduction factor against the EIA assumption of ≥ 95% would be reported within 30 working days following the completion of the monitoring. Copies of the monitoring results of the Silt Curtain Efficiency Test will be provided to SOR, ET, IEC and EPD as appropriate for record.