Ambient water sampling and laboratory analysis shall be conducted during the wet and dry season at designated monitoring stations within Hong Kong waters. Effluents from different treatment plants and pilot plants shall be sampled and analysed.

(1) Ambient water samples shall be collected at sampling stations as shown in Figure A.1 in Appendix A of the Specification. The locations of monitoring stations may be changed from time to time and these will be instructed by the Inspecting Officer before each survey exercise. The Contractor shall request the Inspecting Officer’s confirmation of the locations of monitoring stations before each survey exercise.

(2) The Contractor shall note that for Survey Exercises B1 and B2 in Table B.1 of the Specification, additional sampling work may be required on the same day at up to 3 additional stations (5 stations in total) for analysis of the analytes as stated in Table B.2 (and Table B.3 as optional items). These additional stations for Survey Exercises B1 and B2 will be in close proximity to the 8 stations for Survey Exercise A in Table B.1. The exact number of sampling stations required and the list of analytes to be analysed will be advised by the Government Representative when this service contract commences. The exact locations will be instructed by the Inspecting Officer before the survey starts.

All survey work shall be carried out in accordance with the Survey Programme and Schedule of Sampling and Analysis (Table B.1) detailed in Appendix B of the Specification. All ambient water sampling work shall be conducted during daytime.

(1) All equipment shall comply with the requirements detailed in this Specification together with Appendix C and Appendix D. The Contractor shall ensure that all equipment used be fit for the purpose and provide full details of all equipment to the Inspecting Officer before approval in sufficient time before the first survey exercise.

(2) A copy of the list of equipment approved by the Inspecting Officer for the survey be carried out shall be available on board the vessel for each survey exercise. The Field Survey Manager shall check and sign the list on a Proforma to be provided by the Contractor and a copy of this signed proforma shall be included with the Contractor’s report. Originals or Certified True Copies of all calibration certificates shall be carried on board and shall be made available to the Inspecting Officer for inspection on demand. The Contractor shall not make any changes to the approved equipment list without the prior approval of the Inspecting Officer.

The location of the survey vessel over the monitoring station shall be within 20 m of the specified location. The actual position as measured by the DGPS shall be recorded and included in the Contractor’s report.
Ambient water samples shall be collected:

(a) from the surface (1 m below) for Survey Exercise A

(b) as composite of samples collected 1 m above the seabed, mid-depth and 1 m below the water surface only (a total of 3 depths) for Survey Exercise B1 and B2.

The Contractor shall refer to Table B.1 for details of the Schedule of Sampling. The samples collected shall be delivered to the laboratory for analysis in accordance with Table B.1 and B.2 in Appendix B of the Specification. The volume of water sampled shall be sufficient for all the analysis methods stated by the Contractor.

(2) The water samples to be analysed for metals shall be collected by the “clean sampling technique” as detailed in the five SOPs (SOP-1 to SOP-5) in Appendix D of the Specification regarding field sampling procedures and cleaning methods of all related equipment. The Contractor shall refer to those SOPs for detailed requirements including those for equipment.

If alternative procedures are to be used, the Contractor shall submit the alternative SOPs for approval by the Inspecting Officer. Evidence shall be provided to demonstrate that the alternative procedures are of performance equivalent to (or better than) that of the SOPs in Appendix D.

(3) The water samples to be analysed for all the non-metal analytes shall be collected by appropriate sampling method to the approval of the Inspecting Officer. All sampling equipment shall be cleaned to prevent sample contamination.

(4) Water samples for metal analysis shall be stored and transported according to the SOPs in Appendix D.

Water samples for all other non-metals analytes shall be transferred immediately to clean sample bottles prepared in accordance with the laboratory’s instructions, and labelled with a unique sampling code which shall include the location, date and time of sampling. Unless required otherwise for specific analytes, the samples shall be chilled to 4°C, but not frozen, on board the sampling vessel and shall be stored in coolers such that the temperature can be maintained at 4°C.

(5) Total residual chlorine (Table B.2, Item B5) in ambient water samples shall be determined immediately on-board the survey vessel after sampling.
Two types of effluent samples, namely the CEPT effluent and the BAF (or BAF-equivalent) effluent shall be analysed for all the analytes listed in Table B.2 (and those in Table B.3 as optional items) in appendix B of the Specification. For both the CEPT and BAF effluents, composite samples shall be collected. For the CEPT effluent, a 24-hour composite comprised of at least three samples shall be taken. For the BAF effluent, a composite sample shall be taken to represent operations during one day when pilot plant operations have been optimised.

The Contractor shall collect the samples by using either an automatic sampler or by manual sampling, and shall ensure the accuracy of sampling time and volume. The sampling equipment and storage containers shall be constructed of suitable materials to minimise interference to the subsequent laboratory analysis.

The CEPT and the BAF (or BAF-equivalent) effluents shall be collected at the Stonecutters Island Sewage Treatment Works. The Inspecting Officer will coordinate with the related authorities to arrange for sampling by the Contractor. The exact sampling time shall be instructed by the Inspecting Officer before each sampling exercise. The Contractor shall be responsible for collecting the effluent samples.

The Contractor shall note that effluent sampling for this work will need to be coordinated with other sampling events for the same types of effluents to be conducted by other parties under Contracts other than this one. The Inspecting Officer will advise the Contractor of the day that effluents will be collected by other parties and the Contractor shall collect samples on the day so notified.

Samples collected during the composite sampling shall be maintained at 4 °C on site.

Total residual chlorine (Table B.2, Item B5) shall be determined at the treatment plant immediately upon collection of each effluent sample during the 24-hr sampling period. The Contractor shall thus analyse multiple samples (at least 3) for total residual chlorine for each type of effluent collected at different time over the whole sampling period (rather than analysing only a 24-hour composite sample at the end of sampling).

On docking of the survey vessel, all samples, along with the completed Chain of Custody Forms, shall be immediately transported to the analytical laboratory on the same day. An overnight courier service shall be employed to ensure that any samples sent to overseas laboratories arrive at the laboratory with no delay. Unless required otherwise for specific analytes, samples shall be stored in suitable cool boxes with adequate temperature maintenance measures to ensure that the temperature is maintained at 4°C during transit.
All effluent samples along with the completed Chain of Custody Forms shall be transported immediately to the laboratory after composite sampling is finished. If it is necessary to send the samples to overseas laboratories, an overnight courier service shall be employed to ensure that all the samples arrive at the overseas laboratory with no delay. Unless required otherwise for specific analytes, samples shall be stored in suitable cool boxes with adequate cooler to ensure that the temperature is maintained at 4°C during transit.

The Contractor shall conduct laboratory analysis of the ambient water and effluent samples for analytes as detailed in Table B.1 and Table B.2 in Appendix B of the Specification, in accordance with the data requirements stated therein. The laboratory analysis shall meet all the requirements of detection limit and precision unless otherwise approved by the Inspecting Officer.

Metal analysis shall be conducted in a laboratory with Class 100 clean work environment (e.g. room, chamber, hood, bench etc.) for handling and analysing the samples. The laboratory shall be set up in such a way that the samples for metal analysis will not be outside a Class 100 clean environment at any time. Clean technique shall be used for all procedures to be carried out inside the laboratory. The Contractor shall submit detailed information about such a laboratory to be used, including (but not limited to) its floor plan, design and specification of the clean environment and the relevant QA/QC program and records, for the approval by the Inspecting Officer.

Water samples collected for Survey Exercises B1 and B2 and effluent samples for Survey Exercise C may be required to be analysed for additional analytes as stated in Table B.3 in Appendix B. These optional analytes shall be determined according to the data requirements stated in the Table. The Contractor will be advised by the Government Representative whether these optional analytes are to be included when the contract commences.

The turnaround time of all the analytical results (as draft report) shall be 4 weeks.