DELHI POLLUTION CONTROL COMMITTEE

4th & 5th Floor, ISBT Building, Kashmere Gate, New Delhi-110006
Website: www.dpcc.delhigovt.nic.in

Tender for Supply, Installation and Commissioning of Online Monitoring Station (OLMS) for 5 Years of Operation and Maintenance

[Monitoring Parameters: Measurement of Flow, pH, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Nitrogen (TN) (as Nitrates & Nitrites), Total Phosphorus (TP), Ammonia (NH3), Dissolved Oxygen (DO), Temperature, and Conductivity]

Tender Document No. : DPCC/Lab/2024/T08
Issued on : 07/08/2024
Contact Person : Dr. Nandita Moitra (waterlabdpcc12@gmail.com)

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TENDER DOCUMENT No.: DPCC/Lab/2024/T08 **Dated:** 07 August 2024

I. NOTICE INVITING TENDER (NIT)

DPCC inviting proposals through *http://govtprocurement.delhi.gov.in* from interested firms who meet the eligibility criteria as per the Tender Document for Supply, Installation and Commissioning of Online Monitoring Station (OLMS) with 5 Years of Operation and Maintenance.

The interested bidders should submit the proposals along with the necessary documents have to be submitted only on http://govtprocurement.delhi.gov.in as stipulated in the Tender Document.

Bidders shall submit as part of its Proposal, a 'Bid Security Declaration Form' in the form and manner specified in the Tender Document.

For detailed eligibility criteria and terms of reference, please refer to the Tender Document which can be downloaded from DPCC Website (*www.dpcc.delhigovt.nic.in*) and *http://govtprocurement.delhi.gov.in* as per the schedule**.**

DPCC reserves the right to cancel the bid at any time or amend / withdraw any of the terms and conditions contained in the Bid Document without assigning any reasonthereof.

Member Secretary
Delhi Pollution Control Committee

II. INSTRUCTIONS TO BIDDERS

1. **Cost of Bid:** The bidder shall bear all costs associated with the preparation and submissionof bid and DPCC in no case shall be responsible or liable for those costs, regardless of the conduct or outcome of the tender process.
2. The OLMS system shall be supplied with Solar system (Solar Panel, Battery & Charge controller), the OLMS system including all equipment shall be operational with Solar Supply.
3. The bidder shall supply the Porta cabin for installation of the OLMS as per site requirement.
4. Safety and security shall be in the scope of the vendor.
5. The Supplier shall, in his own interest, insure the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery. The Supplier shall be responsible till the entire stores contracted for arrive in good condition at destination. The transit risk in this respect shall be covered by the Supplier by getting the stores duly insured. The insurance cover shall be obtained by the Supplier in its own name and not in the name of the DPCC or its Consignee.
6. Any civil/mechanical/electrical work required for installation, testing & commissioning of OLMS shall be in Vendor scope.
7. The bidder is expected to examine all instructions, forms, terms and conditions in the Tender Document. Failure to furnish all information required by the Tender Document or submissionof a tender not substantially responsive to the Tender Document in every respect will be at the bidder's risk and may result in rejection of the bid.
8. The bidder shall not make or cause to be made by any alternation, erasure or obliterationto the text of the Tender Document.
9. The bidder shall be a Single Entity. Joint Venture/ Consortium of entities is not allowed.

10. Preparation of Bids

10.1 **Language:** Bids and all accompanying document shall be in English language. In case any accompanying documents are in other languages, it shall be accompanied by an English Translation. The English version shall prevail in matters of interpretation.

10.2 **Form of Bid:** The form of bid shall be completed in all respects and duly signed and stamped by an authorized representative of the Bidder. Relevant power of attorney for signing the bid should be attached.

10.3 **Currencies of Bid and Payment:** The bidder shall submit his financial bid in Indian Rupeesand payment under this contract will be made in Indian Rupees.

11. Clarifications by Bidders

11.1 Bidders requiring any clarification on the Tender Document may submit their queries received via email (at **waterlabdpcc12@gmail.com**) to the DPCC before the date mentioned in the Schedule of Bidding Process at Clause 22.

11.2 DPCC shall endeavour to respond to the queries within the period specified therein but not later than the date specified in the clause 22. The DPCC will reply to all such queries and without identifying the source of queries. DPCC shall not be held responsible in any manner if prospective Bidders miss any notifications placed on

http://govtprocurement.delhi.gov.in.

11.3 DPCC reserves the right not to respond to any questions or provide any clarifications, in its sole discretion, and nothing in this Clause 11 shall be construed as obliging the DPCC to respond to any question or to provide any clarification.

12. Amendment of Tender Document

12.1 At any time prior to the deadline for submission of Proposal, the DPCC may, for any reason, whether at its own initiative or in response to clarifications requested by any Bidder, modify the Tender Document by the issuance of Addendum/ Amendment and postingit on http://govtprocurement.delhi.gov.in .

12.2 In order to afford the Bidders a reasonable time for taking an amendment into account, or for any other reason, the DPCC may, in its sole discretion, extend the Proposal Due Date.

13. Pre-Bid Meeting

13.1 To clarify and discuss issues with respect to the Project and the Tender Document, a Pre-Proposal meeting ("Pre-Bid Meeting") will be conducted in the room of In-charge Water Lab, 4th floor, ISBT Kashmere Gate Building, Delhi Pollution Control Committee, Delhi-110006 (Ph. No. +91-9717593521) on the date and time specified in Clause 22.

13.2 Attendance of the Bidders at the Pre-Bid Meeting is not mandatory. DPCC will endeavor to respond to all queries received by the scheduled date as per clause 22 from all Bidders, irrespective of attendance of the Bidder in the Pre-Bid Meeting.

14. Format and Signing of Bid

14.1 The documents comprising the bid shall be typed and all pages of the bid shall be signed by a person duly authorised to sign on behalf of the bidder. At the time of uploading, the Proposals shall be digitally signed by the bidder or a person or persons duly authorised to bind the bidder to the contract.

14.2 The bid shall contain no alternations, omissions or additions except those to comply with instruction issued by DPCC, or are necessary to correct errors made by the bidder, in which case such corrections shall be initialled/signed by the person signing the bid.

15. Submission of Bids

15.1 The Bidders shall upload the electronic copy of the Proposal (with **all pages numbered** serially and **by giving an index of submissions**) through *http://govtprocurement.delhi.gov.in* after digitallysigning of all the documents**.**

15.2 The Bidder shall upload the Technical Proposal and the Financial Proposal separately by using the appropriate sections on http://.govtprocurement.delhi.gov.in.

15.3 DPCC, if required, will request the Bidder to submit the hard copy of original Bid Securing Declaration and Power of Attorney for scrutiny.

15.4 The Proposal shall be made in the Forms specified in this Tender Document. Any attachment to such Forms must be provided on separate sheets of paper and only information that is directlyrelevant should be provided. This may include photocopies of

the relevant pages of printed documents. No separate documents like printed annual statements, company brochures, copy of contracts etc. will be entertained.

15.5 The rates quoted shall be firm throughout the period of performance of the assignment and discharge of all obligations of the agency under the Agreement.

15.6 **Validity of Bid**: The bid must remain valid and open for acceptance for a period of 180 *[One Hundred and Eighty]* days from the date of opening of Bid.

16. Late and Delayed Bids:

Bidders are encouraged to submit their proposals online well in advance before the prescribed due date and time to avoid any delay or problem during the bid submission process. The Tender Inviting Authority will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to link failure/ internet problem etc.

17. Opening and Evaluation of Technical Bid

17.1 The electronic "Technical Proposals" shall be opened first, through Http://govtprocurement.delhi.gov.in on the date and time specified in clause 22. The "Financial Proposals" shall remain unopened in the Http://govtprocurement.delhi.gov.in , until the subsequent public opening following theevaluation of the Technical Proposals.

17.2 The Technical Bid of the bidder would be evaluated as per the eligibility criteria set out in the Tender Document. Bids will be evaluated based on the information submitted by the bidders. However, DPCC reserves the right to seek clarification/documents from the bidders, if DPCC considers it necessary for proper assessment of the bid.

17.3 The Technical Bids will be evaluated based on eligibility criteria and only those Bidders who meet the requirement shall qualify for further evaluation.

17.4 DPCC may seek clarification related to the tender document during the process of evaluation of technical bid.

18. Opening of Financial Bid and Final Evaluation

18.1 The electronic "Financial Proposals" of the technically qualified bidders shall be opened, through http://govtprocurement.delhi.gov.in on the date and time specified.

18.2 The selection of the bidder shall be based on Least Cost Selection method.

18.3 Failure of the Successful Bidder to comply with the requirements shall constitute sufficient grounds for the annulment of the LOA. In such an event, DPCC reserves the right to,

(a) invite the second lowest bidder and negotiate upon the following scenario, or

(b) take any such measure as may be deemed fit in the sole discretion of DPCC, including annulment of the Bidding Process.

18.4 The Prices offered shall be valid for one year from date of award of Contract, and the agency / firm has to supply the goods with same discount rate throughout contract period irrespective of change of price schedules. There will be no additional charges for Delivery. The Delivery will be FOR on Free of Cost basis. The companies which cannot provide validity of rates for One Year and price list need not to apply.

18.5 If more than one bidder happens to quote the same lowest price, DPCC reserves the rightto decide the criteria, decision of DPCC shall be final.

19. Right to accept any Bid and to reject any or all Bids

19.1 DPCC is not bound to accept the lowest bid or any bid and may at any time by giving notice in writing terminate the tendering process.

19.2 DPCC may terminate the contract/cancel the LOA if it is found that the bidder is blacklisted/banned/debarred/penalized/disqualified for reasons of corrupt and fraudulent practices on previous occasions by any of the central/state government ministry/ department/ institutions/local bodies/municipalities/PSUs, etc.

19.3 DPCC may also terminate the contract/cancel the LOA in the event the Successful Bidder fails to furnish the performance security or fails to execute the agreement.

20. Award of Contract

20.1 DPCC will award the contract to the Successful Bidder to perform the contract satisfactorily as per the terms and conditions incorporated in the Tender Document.

20.2 DPCC will communicate the Successful Bidder by Mail confirmed by letter transmitted by registered/speed post that his bid has been accepted. This letter (hereinafter and in the condition of contract called the "Letter of Award") shall prescribe the amount which DPCC will pay to the Successful Bidder in consideration of the execution of work/services by them as prescribed in the contract.

20.3 The Successful Bidder will be required to commence the assignment at the earliest as communicated by DPCC in this regard.

20.4 The Successful Bidder will be required to execute the contract for the services within a period of sixty (60) days from the date of issue of Letter of Award.

21. Bid Security and Performance Security

21.1 Bid Security

The Bidder shall furnish as part of its Proposal, 'Bid Securing Declaration Form' as per theformat stipulated in the Tender Document.

21.2 Performance Security

The Successful Bidder shall be required to furnish a Performance Security prior to sign the contract (for an amount which is 5% of total project cost) in the form of Bank Guarantee from a scheduled Bank in acceptable form in favour of 'Delhi Pollution Control Committee' payable at New Delhi. The Performance Security shall remain valid for a period of 60 (sixty)days beyond the date of completion of all contractual obligations. In case the contract period is extended further, the validity of Performance Security shall also be extended by the Successful Bidder accordingly. The format for BG for Bid Security is provided at Annexure-VIII.

Failure of the Successful Bidder to comply with the requirements of above clauses shall constitute sufficient grounds or the annulment of the award and other actions as deemed necessary.

22. Schedule of Bidding Process

DPCC would endeavour to adhere to the following schedule:

S.No.	Event Description	Date and Time
1.	TENDER DOCUMENT Publish date	07th August 2024
2.	TENDER DOCUMENT download start date	07th August 2024 from 17:00 Hrs.
3.	Clarification start date	09th August 2024 from 18:00 Hrs.
4.	Clarification end date and time	13th August 2024 at 18:00 Hrs.
5.	Pre-Bid Meeting	14th August 2024 at 12:00 Hrs.
6.	DPCC response to queries	22th August 2024
7.	Bid Submission Start Date &Time	23rd August 2024 at 11:00 Hrs.
8.	Bid Submission end date &time	28th August 2024 upto 12:00 Hrs.
9.	Last date & time for downloading the TENDER DOCUMENT	28th August 2024 upto 12:00 Hrs.
10.	Last date & time for submission (upload) of online bidding document (Proposal Due Date or PDD)	28th August 2024 upto 12:00 Hrs.
11.	Opening of Technical Proposals through http://govtprocurement.delhi.gov.in	28th August 2024 upto 14:00 Hrs.
12.	Opening of Financial Proposal through http://govtprocurement.delhi.gov.in	To be informed later
13.	Signing of Agreement	Within 15 days of acceptance of LoA
14.	Validity of Bid	180 days from opening of the bid.

III. ELIGIBILITY AND EVALUATION CRITERIA

Technical

1. Having successfully completed the work for **Supply, Installation, Testing and Commissioning (SITC) of Online Monitoring System (OLMS) for Water Quality for any 05 (five) parameters such as COD, BOD, TSS, pH, Ammonia, etc. along with Flow (Radar type), in 01 (one) project** in any Govt., Semi Govt., Govt. undertaking body, during **last 05 (five) years.**

2. Having successfully completed at least 03 (three) years CMC/O&M for a minimum of 10 (ten) nos. of locations in River/Drain/STP/CETP/ETP in any Govt., Semi Govt., Govt. undertaking body, during last 05 (five) years and Satisfactory completion performance certificate duly signed by Authorized Signatory.

3. Authorization from Original Equipment Manufacturer (O.E.M.) by mentioning the Tender Number in the authorization certificate/letter for the quoted instruments/systems, if the bidder is not an O.E.M.

4. Bidder or O.E.M. should be directly operational with office set up in India for a minimum of last 05 (five) years from the date of N.I.T.

5. The bidder shall submit a declaration on letter head with signed and stamped that they are meeting the complete technical specifications as mentioned in the tender document.

6. The bidder shall submit the literature, catalogues, brochures for quoted instruments/systems, servers, software & hardware, solar panel and related accessories as requested in the tender documents. This is required to verify the technical specifications quoted in the tender.

7. The bidder must comply each and every point of CPCB Guidelines https://cpcb.nic.in/upload/thrust-area/revised-GUIDELINES-final-sent-for-publication-on07.11.2014.pdf as per latest guidelines and it will be tenderer's responsibility to comply all SOP points during commissioning and Operation & Maintenance of OLMS system.

8. The bidder should provide a complete list of spares and consumables required for 05 (five) years for trouble free operation and maintenance of the instrument and a certificate to be given by O.E.M. that spare parts will be made available for five years.

Financial

9. (i) The bidder shall submit an Earnest Money Deposit (EMD) of Rs. 50 Lakhs (Rupees Fifty Lakhs only) in the form of Bank Guarantee/DD/FDR in favor of DELHI POLLUTION CONTROL COMMITTEE, payable at Delhi. The EMD amount as specified above must accompany the tender. EMD is required to be submitted in original separately on or before the last date of submission of bid as per the NIT in DPCC. Scanned copy of EMD is required to be uploaded along with Technical Bid.

   (ii) EMD exemption shall be given to MSMEs as per applicable rules provided, they are registered for the said particular category/activity. If any MSME is not fulfilling the criteria as prescribed in the tender, their bid shall not be considered for evaluation. In case the Bidder falls in these categories, they should furnish certified copy of their registration with

MSME or NSIC, clearly specifying the details of items for which they are registered.

(iii) No relaxation shall be given to the Startups as the project under consideration relates to public safety and health.

(iv) The EMD shall be valid for a period of 120 days from the date of opening of the bid.

10. The Minimum required average annual turnover in respect of Procurement of Supply, Installation, Testing, and Commissioning of goods for the successful Bidder/ Bidders' Manufacturer in the last 03 (three) years shall be minimum INR 20 Crore (Twenty Crore).
11. The bidder shall submit Audited Balance Sheets of last 03 (three) financial years (2020-21, 2021-22, 2022-23) with auditor's certificate regarding annual turnover from contracting business in each year.
12. The bidder shall submit Profit/Loss A/c for last 03 (three) financial years (2020-21, 2021-22, 2022-23), out of which the company should not be in loss more than 01 (one) financial year.
13. The bidder shall submit Valid GST registration certificate, Professional Tax (if applicable), Income Tax Returns for last 03 (three) financial years with "PAN Card" and Trade License.
14. The bidder shall submit a written declaration in the form of the affidavit duly notarized as to correctness of the copies of all documents submitted and a declaration that presently the bidder is not blacklisted/banned/debarred/penalized/disqualified for reasons of corrupt and fraudulent practices by any State/Central Govt./PSU on date of bid submission.

My Document (Non-Statutory Cover) containing

- **Certificates:**

1. Credential with completion certificates during last 05 (five) years under any Govt/Semi Govt. /Statutory or Local Bodies for successful completion of the work for "**Online Data Acquisition, Monitoring & Control System through Local & Remote Terminals, based on GSM/WiFi or any other suitable System, including Supply of Field Instruments, for a minimum of 10 nos. of locations in River/Drain/STP/CETP/ETP"** having value not less than **INR 09 Crore (Nine Crore)** with a performance certificate.
   Or
   As stated in Eligibility for Participation,

- **Company Details**

   1. Registered Deed for Partnership Firm
   2. Trade License for Proprietorship Firms.
   3. Memorandum and Articles of Association for Limited Companies
   4. Society Registration and Bye-Laws for Cooperative Societies.

- The bidder should not have record of poor performance or they should not have been blacklisted/banned/debarred/penalized/disqualified by any employer during the last 03 (three) years prior to the date of the NIT. Such abandonment or punishment will be considered as disqualification towards eligibility. A declaration in this respect through affidavit has to be furnished by the prospective bidders.

- **Completion Certificate:**

  i. Completion Certificates for fully completed works during the last five financial years will only be accepted.

  ii. Completion Certificate of works executed in Departments of Central/ State Government or Govt. undertaken organizations, may also be considered. Such Completion Certificates are to be duly signed by Authorized Signatory.

IV. TECHNICAL SPECIFICATION OF THE PROPOSED OLMS SYSTEM

Monitoring Parameters: Measurement of Flow (Radar type), pH, Biological Oxygen Demand(BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Nitrogen (TN)(as Nitrates & Nitrites) Total Phosphorus (TP), Ammonia (NH3), Dissolved Oxygen (DO), Temperature, and Conductivity

The specification of the Controllers, Probes/Sensors, Server for centralized data connectivity for the OLMS, Calibration of OLMS, OLMS Function check, Continuous Validation of OLMS shall strictly be in compliance with the latest "Guidelines for Online Continuous Effluent Monitoring Systems (OLMS)" & "latest S.O.P. Version", issued by CPCB.

Some salient features of the equipment are as follows: - (The specifications given below are indicative and not exhaustive. The tenderer has to consider all technical aspect of the equipment to comply the latest Guidelines & S.O.P. issued by CPCB.)

1. Original Equipment Manufacture Qualification Criteria:

Sr. No	Item	Description of Requirement
1	Bidder or OEM Office	Bidder or OEM should be directly operational in India since last 2 years from the bid calling date.
2	OEM Company Certificates	TUV/USEPA/EPA/MCERTS

2. Technical Specifications and Salient Features Regarding Online Water Quality MonitoringSystem.

i. Should be capable of operating unattended over prolonged period of time.
ii. System should be UV-Visible double beam spectrometry.
iii. System should have multipoint calibration facility.
iv. System should be complied as per latest CPCB Direction.
v. System should be complied new SOP published by CPCB.
vi. Should produce analytically valid results with precision and repeatability.
vii. The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.
viii. The Analyzer should have inbuilt features for automatic water matrix change adaption.
ix. The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices.
x. Should have data validation facility with features to transmit raw and validated data to DPCC central server.
xi. Should have Remote system access from DPCC central server provisioning log file

access.

xii. Should have provision for Multi-server data transmission from each station without intermediate PC or plant server.

xiii. Should have provision to send system alarm/sms/whatsapp/email to DPCC in case any changes made in configuration or calibration.

xiv. Should have provision to record all operation information in log file.

xv. For each parameter there should be provision for independent analysis, validation, calibration & data transmission.

xvi. Must have provision of a system memory (non-volatile) to record data for at-least one year of continuous operation.

xvii. Should have provision of Plant level data viewing and retrieval with selection of Ethernet, wireless, Modbus & USB.

xviii. The correlation/interpretation factor for estimating COD and BOD using UV-Visible Absorption Technique shall be regularly authenticated/ validated and details provided.

xix. Record of calibration and validation should be available on real time basis on DPCC central server from each location/parameter.

xx. Record of online diagnostic features including sensor status should be available in database for user friendly maintenance.

xxi. Expandable program to calculate parameter load daily, weekly or monthly basis for future evaluation with flow rate signal input.

xxii. Must have low operation and maintenance requirements with low chemical consumption and recurring cost of consumables and spares.

xxiii. System must support visualization of parameters data onboard which is real time and records on real time basis. The parameter files recorded on data logger of 4GB are non-editable to safeguard authenticity of parameters.

xxiv. Sensor should be operational in high Chloride applications.

xxv. Sensor and cable should be with IP68 rating and specially designed for submerged installations.

xxvi. MOC of Sensor should be SS316L with compressed air cleaning facility.

xxvii. Sensor must measure full spectrum scanning for each parameter at specific bands of multiple wavelengths and provides sum parameter for COD, BOD, TSS, pH, TN, TP, DO etc.

xxviii. Extended life of xenon flash lamp in spectrophotometric sensor with minimum 10^{19} flashes should be available.

xxix. All the remote stations should be operational in a real time mode and DPCC central station should be able to access any remote station.

xxx. The remote stations should be field operational and tolerant to extreme environmental conditions in India, in high or low temperatures, high humidity coastalconditions and high temperature.

xxxi. The communication between Remote and DPCC Central Receiving station must be two-way communication system utilizing GPRS.

xxxii. Remote station should have built in GPS receiver for automatic position determination.

xxxiii. DPCC Central Receiving station (Installed by Vendor)must have the capability to remotely configure allremote stations.

xxxiv. Multiple Component Analysis with Pattern Recognition & Library of Effluent MatrixVariant.

xxxv. Multiple Component analysis with Multi- Point Calibration for Total COD, BOD, TSSetc.

xxxvi. Individual parameter method analysis, Individual Calibration, Individual Validationwithout any coefficient calculation from one parameter to another.

xxxvii. Automatic Sampling during calibration as per published CPCB SOP must be featured as integral part of OLMS and every sample collection automatic real time monitoring must be part of data submission to DPCC and other agency with sample collection tag number and sample collection timeline. The sample must be collected as per USEPA/CPCB compliance and document in this direction must be submitted by bidder.

xxxviii. Online data acquisition, monitoring & control system through local & remote terminals, based on GSM/WiFi or any other suitable System, including Supply of Field Instruments for the OLMS.

2.1. Additional Technical Points:

i. System should work on wavelength of 200-750nm and all analyses should have independent values.

ii. System should have UV Visible dual beam technology.

iii. System must have Automatic File Transfer features.

iv. Automatic Sampling for laboratory measurement Feature Onboard.

v. PLC Based basic features for process control to comply regulatory guidelines.

vi. Probes and stations must be accessible remotely from any suitable device from any standard web browser e.g. via PC, Tablet, Notebook or Smart Phone.

vii. System must have Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.

viii. System must have optimal display readability with Classic-, Day- and Night-Mode.

ix. Quality controlled and documented status management of probes and stations mustbe available to eliminate the need for paper log books.

x. Analyzer must provide self-adaptive, self-controlled data validation in real time.

xi. It must ensure both sensitive and reliable alarm limits respectively setpoints for process control.

xii. Analyzer System must analyze noise, outliers and other combinations in real time to reliably detect any malfunction at an early stage.

xiii. Analyzer System must help to dramatically reduce false alarm rates.

xiv. Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.

xv. Analyzer System must have unmatched event detection tools based on proven algorithms for real-time event detection that use data streams from all connected probes separately and in combination.

xvi. Analyzer System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection.

xvii. Analyzer System must be optimized for use of multi-dimensional spectral data Analyzer System must have configurable auto-correction of data based on threshold,

outlier and noise analysis.

3. Sensors shall meet following specifications:

Spectrometry Based multi-parameter probe:

i. No parts to be replaced within 3 years, no consumables required.
ii. System should have built-in spectral information for Drain/ River Water Quality data.
iii. No sample preparation required.
iv. Sensor shall be submersible in open channels or tanks.
v. No moving parts in contact with Drain/River water.
vi. Auto compensation of potential interference by turbidity/solids.
vii. All sensor should be IP68 and transmitter/display should be IP65.
viii. Auto diagnostic features.

3.1. Minimum specification for pH Sensor

Parameter	Specification
Basic Requirement	**pH Sensor Specifications:** • Integrated temperature measurement and compensation should be provided in the pH sensor. • The pH sensor should have galvanically separated input. • Calibration history should be stored automatically in the sensor. • Field Sensor calibration • Signal Output – Digital • Sensor Check function/Diagnostics should be available in the pH sensor • protection type: IP 68 for both Sensor and Cable
Measuring Range	• Measuring Range: pH: 0 - 12 (Sensor should be designed forwastewater application) • Measuring: 0 to 60 Deg C
Measuring Principle	ISE - Potentiometric -combined, non-porous reference electrode
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions
Operating Temperature	Temp Compensation: 0 to +60 Deg C
Material of construction of sensor	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.
Calibration	Calibrate pH meter with Certified (having international traceability) Buffer solutions of pH 4, 7, 9.2 & 10. Perform at-least two-point calibration within the expected range of the pH in the plant. For example, if pH is expected to be 7.8 then perform two points calibration with pH 7 and 9.2.
Certifications	TUV/MCERT/USEPA

Reagent Free	The pH combination electrodes should require very little maintenance and there should be no electrolyte replacement.
Voltage Protection	Transient Voltage Protection should be integrated in the sensor
Accuracy	≤ 0.1 units of pH certified reference standard
Resolution	≤ 0.01 units of pH
Response Time	≤ 30 seconds
Method of Measurement	Potentiometric-Automatic compensation of Temperature
Cleaning	Automatic cleaning
Operating Humidity	5 to 95% non-condensing
Interface connection to display	sys plug (IP 67), RS485
Power	12V/24V DC Nominal
Protection Class	IP68 for sensor
Operating Pressure	0... 400mbar
Signal output	Compatible with Data Acquisition System
Transmitter output	Default: 2 X 4-20 mAAdditional optional: MODBUS RS485, HART, PROFIBUS.
Transmiter Mounting	Pole/wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics
Enclosure Material	Stainless Steel with epoxy coating for Analyser
Calibration frequency	Once after every 2 weeks
Tag plate	SS Tag plate

3.2. Specifications for Biochemical Oxygen Demand (BOD) sensor

Parameter	Specification
Basic Requirement	Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology • System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values. • System should have spectrophotometric probe made of SS316L/Titanium or equivalent. • Multi Parameter probe ideal for monitoring of BOD/COD/TSSin Municipal Wastewater. • The Sensor should have optimized function check referencing for excellent zero point and long-term stability. • The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum. • System should be UV-Visible double beam spectrometry • System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020 • System should be complied as per latest CPCB Direction, SOP& Guidelines. • Should produce analytically valid results with precision and repeatability. • The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status. • The Analyzer should have inbuilt features for automatic water matrix change adaption. • The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices. • For each parameter there should be provision for independent analysis, validation, Independent parameter calibration & data transmission. • Sensor and cable should be with IP68 rating and specially designed for submerged installations.
Measuring Range	0 - 200 mg/L (with possibility to check higher ranges and should be expandable).
Accuracy	+/- 2.0 % in reference solution. +/- 10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.

Reagent & Consumables Free	• The Sensor should not use any reagents and should be easy to use and operate without any running costs. • The sensor should completely be reagent free for operation.
Measuring Principle	Should be as per the CPCB guidelines UV-Visible is double Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum
Measurement	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant
Operating Temperature	Operating temperature: 0°C to +45 °C; Storage temperature: -20 °C to +60 °C
MOC	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.
Light Source	Must emit UV and Vis wavelength of light.
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions
Inbuilt Cleaning	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a predefined interval. Chemical cleaning is not recommended.
Calibration	Multipoint calibration for each spectrophotometric parameter
Protection Rating	Protection type: IP 68 for both Sensor and Cable
Certifications	TUV/MCERT/USEPA
Automatic compensation cross sensitivities	Turbidity / solids and temperature
Interface connection to display	MIL/M16 connection, IP 68, RS485, 12 VDC
Operating Humidity	5 to 95% non-condensing
Pressure	10 Bar
Power	12V DC Nominal
Signal output	Compatible with Data Acquisition System
Resolution	≤ 1 mg/L or better
Response Time	≤ 60 seconds
Protection	Sensor IP-68 and Transmitter IP-67
Enclosure	Stainless Steel with epoxy coating for Analyser
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics
Calibration frequency	Once in a month

Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.
Transmitter Mounting	Pole/ wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight
Surge Protection	Inbuilt
Tag Plate	SS tag plate

3.3. Specifications for Chemical Oxygen Demand (COD) Sensor

Parameter	Specification
Basic Requirement	Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology • System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values. • System should have spectrophotometric probe made of SS316L/Titanium or equivalent. • Multi Parameter probe ideal for monitoring of BOD/COD/TSSin Municipal Wastewater. • The Sensor should have optimized function check referencing for excellent zero point and long-term stability. • The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum. • System should be UV-Visible double beam spectrometry • System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020
	• System should be complied as per latest CPCB Direction, SOP& Guidelines. • Should produce analytically valid results with precision and repeatability. • The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status. • The Analyzer should have inbuilt features for automatic water matrix change adaption. • The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices. • For each parameter there should be provision forindependent analysis, validation, Independent parameter calibration & data transmission. • Sensor and cable should be with IP68 rating and specially designed for submerged installations.
Measuring Range	0 - 300 mg/L(with possibility to check higher ranges)
Accuracy	+/- 2.5% in reference solution. +/- 10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.

Reagent & Consumables Free	• The Sensor should not use any reagents and should be easy to use and operate without any running costs. • The sensor should completely be reagent free for operation.
Resolution	≤ 1 mg/L or better
Response Time	≤ 60 seconds
Measuring Principle	Should be as per CPCB Guidelines. UV-Visible is double Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum
Measurement	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant
Operating Temperature	Operating temperature: 0°C to 45 °C; Storage temperature: -20 °C to 60 °C
MOC	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.
Light Source	Must emit UV and Vis wavelength of light.
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions
Inbuilt Cleaning	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a predefined interval. Chemical cleaning is not recommended.
Calibration	Multipoint calibration for each spectrophotometric parameter
Protection Rating	Protection type: IP 68 for both Sensor and Cable
Certifications	TUV/MCERT/USEPA
Automatic compensation cross sensitivities	turbidity / solids
Interface connection to display	MIL connector, IP 68, RS485, 12 VDC
Operating Humidity	5 to 95% non-condensing
Pressure	10 Bar
Power	12V/24V DC Nominal
Signal Output	Compatible with Data Acquisition system
Protection	Sensor IP-68 and Transmitter IP-67
Enclosure	Stainless Steel with epoxy coating for Analyser
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics

Calibration frequency	Once in a month
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.
Transmitter Mounting	Pole/ wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight
Surge Protection	Inbuilt

3.4. Specification for Total suspended solids (TSS) sensor

Parameter	Specification
Basic Requirement	Continuous Effluent Monitoring of BOD, COD, TSS with UV-V is Full Spectrum dual beam technology • System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values. • System should have spectrophotometric probe made of SS316L/Titanium or equivalent. • Multi Parameter probe ideal for monitoring of BOD/COD/TSSin Municipal Wastewater. • The Sensor should have optimized function check referencing for excellent zero point and long-term stability. • The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum. • System should be UV-Visible double beam spectrometry • System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020 • System should be complied as per latest CPCB Direction, SOP& Guidelines. • Should produce analytically valid results with precision and repeatability. • The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status. • The Analyzer should have inbuilt features for automatic water matrix change adaption. • The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices. • For each parameter there should be provision forindependent analysis, validation, Independent parameter calibration & data transmission. • Sensor and cable should be with IP68 rating and specially designed for submerged installations.
Measuring Range	0 - 300 mg/L(with possibility to check higher ranges)
Accuracy	With Calibration: <1% of the measured value ±0.01 FNU/NTU+/-10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.

Parameter	Specification
Reagent & Consumables Free	• The Sensor should not use any reagents and should be easy to use and operate without any running costs. • The sensor should completely be reagent free for operation.
Resolution	≤ 1 mg/L or better
Response Time	≤ 60 seconds
Measuring Principle	Should be as per CPCB Guidelines. UV-Visible is double Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum
	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant
Operating Temperature	Operating temperature: -4°C to +50 °C; Storage temperature: -20 °C to +60 °C
MOC	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.
Light Source	Must emit UV and Vis wavelength of light.
Sensor Cable	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions
Inbuilt Cleaning	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a predefined interval. Chemical cleaning is not recommended.
Calibration	Multipoint calibration for each spectrophotometric parameter
Protection Rating	Protection type: IP 68 for both Sensor and Cable
Certifications	TUV/MCERT/USEPA
Automatic compensation cross sensitivities	turbidity / solids
Interface connection to display	MIL connector, IP 65, RS485, 12 VDC
Operating Humidity	5 to 95% non-condensing
Pressure	10 Bar
Power	12V DC Nominal
Signal output	Compatible with Data Acquisition System
Protection	Sensor IP-68 and Transmitter IP-65
Enclosure	Stainless Steel with epoxy coating for Analyser
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.

Parameter	Specification
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics
Calibration frequency	Once in a month
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.
Transmitter Mounting	Pole/ wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight
Surge Protection	Inbuilt

3.5. Specification for Total Nitrogen (TN)

Parameter	Specification
Basic Requirement	**Total Nitrogen Sensor Specifications:** • Integrated measurement for parameters compensation should be provided in the Total Nitrogen Sensor. • Calibration history should be stored automatically in the sensor. • Field calibration facility • Signal Output –Digital • Sensor Check function/Diagnostics should be available in the Total Nitrogen Sensor. • Protection type: IP 68 for both Sensor and Cable • Preferably built-in automatic sensor aperture cleaning assembly
Measurement Principal	Should be as per International Reference Methods to measure Total Nitrogen. I) Based on 720°C thermal decomposition with Chemiluminescence Detection technology, Reference method ASTM 8083-16. II) Based in colorimetric method to measure Total Nitrogen as per APHA 4500
Reagent Free	The Ammoniacal Nitrogen and Nitrate Nitrogen electrodes should require very little maintenance and they should not require any add on chemical for continuous measurement.
MOC	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.
Sensor Cable	Integrated 15-meter cable with arrangement to increase length as per site conditions
Voltage Protection	Integrated in the sensor
Measuring Range	Total Nitrogen: 0…500 mg/L (measurable up to 1000 mg/l considering the sewage waste water environment)
Calibration	Matrix adjustment against any reference value, multi-point calibration possible with multiple standard solution.
Measurement Accuracy	± 5 % of measured value ± 0.2 mg/l in standard solutions
Operating Temperature	Temp Compensation: 0 to +60 Deg C
Certifications	TUV/MCERT/USEPA
Response time	60 sec
Power supply	10 - 30 VDC
Interface connection	sys plug, IP 67, RS485
Operating pressure	0 - 1 bar
Protection	Sensor IP-68 and Transmitter IP-67

Enclosure	Stainless Steel with epoxy coating for Analyser
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics
Calibration frequency	Once in a month
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485,HART, PROFIBUS.
Transmitter Mounting	Pole/ wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight
Surge Protection	Inbuilt

3.6. Specification for Total Phosphorus analyzer

Parameter	Specification (as per CPCB Guidelines)
Measurement Range	Auto-ranging: 0.0016 to 16.3 ppm (Total Phosphorus)
CHEMICAL METHOD	
Phosphate	Phosphomolybdenum blue
Background color correction	Compensated at the measurement wavelength
Self-cleaning	Programmable automatic chemical rinsing – piston cleaned every measurement
MEASUREMENT MODE	
Batch measurement	User-selectable 1 to 4 measurements per hour
Sample streams	Single or up to 3 streams – sequencing is programmable
MEASUREMENT PERFORMANCE	
Accuracy	<±5 % of reading or ±0.005 ppm (whichever is the greater)
Repeatability	<Max. ±5 % of reading3 or ±0.030 ppm (whichever is the greater)
Resolution	0.001 ppm or 1 ppb
Measurement units	mg/l, ppm, ppb, µg/l
Calibration	2-point, automatic calibration, with the option of manual initiation. The interval between automatic calibrations manually selectable from four times a day to once per week
ENVIRONMENTAL DATA	
Ambient Operating Temperature	5 to 45 ºC (41 to 113 ºF)
Ambient Operating Humidity	Up to 95 % RH non-condensing
Sample Temperature	1 °C to 40 °C (32 °F to 104 °F)
Sample Flow	Continuous, 200 to 500 ml/min
Sample Pressure	5 psi maximum
Sample Limitations	Samples containing particles 100 microns (0.004 in) in diameter or larger may require pre-filtration
MAINTENANCE	
Routine service interval	12 months
Reagent consumption	0.75 ml of each reagent per measurement
Display	Color, TFT, liquid crystal display (LCD) with built-in backlight and brightness adjustment Diagonal display area 145 mm (5.7 in) 76800 pixel display
MECHANICAL DATA	
Ingress protection	IP31
Sample connections	Inlet: 6 mm OD push-fit x 1/4 in BSP elbow Outlet: 10 mm OD push-fit x 3/8 in BSP elbow

Materials of construction	Electronics enclosure: 10 % glass loaded polycarbonate Main enclosure: Any Non-Corrosive material with laboratory report of NABL accredited lab.
ELECTRICAL	
Power supply ranges	100 to 240 V max. AC 50/60 Hz ± 10 %
ANALOG OUTPUTS	
Single and multi-stream analyzers	6 isolated current outputs, fully assignable and programmable over a 0 to 20 mA range (up to 22 mA if required)
ALARMS/RELAY OUTPUTS	
Single- and multi-stream analyzers	One per unit: · Stop relay · Attention relay · Failure relay · Calibrate relay Six per unit Fully user-assignable alarm relays
Rating	Voltage 250 V AC 30 V DCCurrent 5 A AC 5 A DC Loading (non-inductive) 1250 VA 150 W
CONNECTIVITY/COMMUNICATIONS	
Ethernet connection	Web server with ftp For real-time monitoring, configuration, data file access and email capability
Data Handling, Storage and Display	
Security	Multi-level security: Operator and configuration Password or security switch
Storage	Removable Secure Digital (SD) card
Trend analysis	Local and remote
Data transfer	SD card or FTP
Diagnostics features	System diagnostics: power shutdown, sensor failure, data transmission failure.
	Parameter diagnostics: Calibration timeframe, calibration drift alert
	High/low parameter permissible thresholds limit diagnostic
	Maintenance and calibration schedule diagnostics
Calibration frequency	Once in a month
Transmitter output	Default: 2 X 4-20 mA Additional optional: MODBUS RS485,HART, PROFIBUS.
Transmitter Mounting	Pole/ wall mounted
Display	Colour TFT LCD 640X480 pixels with LED backlight

Surge Protection	Inbuilt

3.7. Specification for Dissolved Oxygen

Parameter	**Specification**
measuring principle	fluorescence
resolution	0.01 mg/l O2
accuracy (standard solution)	O2: +/- 0.02 mg/l or +/- 1 %* (*whichever is greater)
response time (T90)	60 ... 0 sec.
reference standard	saturated sodium sulfite solution
integrated temperature sensor	0 ... 50 °C
operating temperature	0 ... 60 °C
operating pressure	0 ... 7 bar
installation / mounting	submersed or in a flow cell
ingress protection class	IP68
automatic cleaning	media: compressed air permissible pressure: 2 4.5 bar
storage temperature	0 ... 60 °C

3.8. Specification for Conductivity

Parameter	**Specification**
measuring principle	4-electrode, direct-contact
Resolution	1 µS/cm or 0.01 mS/cm or 0.1 PSU
accuracy (standard solution)	0.1% of reading
automatic compensation instrument	temperature
integrated temperature sensor	-20 ... 90 °C
operating temperature	0 ... 70 °C
operating pressure	0 ... 20 bar
installation / mounting	submersed or in a flow cell
process connection	quick connect
flow velocity	0.01 m/s (min.) 3 m/s (max.)
automatic cleaning	media: compressed air permissible pressure: 2 ... 6 bar
storage temperature	0 ... 60 °C
conformity - EMC	EN 61326-1
protection class (-000)	IP67
protection class (-075)	IP68

3.9. Specification for Ammonium

Parameter	Specification
measuring principle	ISE
measuring principle detail	NH4-N: ionophore membrane
resolution	NH4-N, 0.01 at 0.02…19.99 mg/l 0.1 at 20.0… 99.9 mg/l 1 at 100… 1000 mg/l T: 0.1 °C
accuracy (standard solution)	NH4-N: +/-3% or +/-0.5mg/l* (*whichever is greater)
response time (T90)	0 ... 60 sec.
operating temperature	0 ... 60 °C
operating pressure	0 ... 1 bar
installation / mounting	submersed or in a flow cell
flow velocity	0.01 m/s (min.), 3 m/s (max.)
automatic cleaning	media: compressed air permissible pressure: 2 ... 4 bar
storage temperature (electrode)	2 ... 40 °C
storage temperature (sensor)	2 ... 40 °C
protection class (-000)	IP67
protection class (-075)	IP68

3.10. Specification for Smart Controller and Data logger

Parameter	Specification
Basic Requirement	Controller should have the latest features of highly advanced Multi Parameter Controller having capability of handling at least 5 (five) Sensors in a single controller configuration for the parameters COD, BOD, TSS, pH, TN, TP and must be expandable for more parameters & sensors as and when required. • With Sensor ID recognition • High EMC interference immunity • Control unit should be latest touch screen display for the quick selection of software functions • Integrated lightning protection • With integrated back up controller function • The system should start automatically after the power is reset to the system (in case of power failure). • The system should have Service mode for cleaning /calibration/maintenance activities. • High-end IoT (Internet of Things) terminal preferably based on an industrial PC, minimum IP65 grade. • Large graphic display (5" or above) with backlight with adequate contrast for clear viewing in low ambient light and sunlit bright outdoor lighting conditions. • Sensor and station management of up to 20 parameters: automatic cleaning, data logging, sample & calibration incl. history and multipoint calibration, sensor function check, user management, easy data transfer via USB-stick etc. • The Controller should preferably be able to power all the sensors and terminals or accessories attached to it without having to need any additional power sources in the system for increasedprotection against lightening and possible electromagnetic interference. The controller shall be low power operation andoperable in 220VAC / DC (to be generated within the controller itself). • IoT (Internet of Things) and M2M (Machine to Machine) connectivity: Minimum 1 Gb/s Ethernet, 300 Mb/s Wi-Fi

Parameter	Specification
	802.11a/b/g/n and optional worldwide HSPA+ 3G interface, remote control (http), data transfer into cloud via FTP, SSH and TML • Process interface to SCADA via: Modbus RTU/TCP, SDI-12, ProfibusDP, analog 0/4-20mA and relay outputs • Integration of third party sensors via: analog 0/4-20 mA and digital (solid state) inputs, Modbus RTU/TCP • Easily extendable: 8 slots to customize I/Os, additional software features like online data validation and event detection optional
Display	• With (size 5" or above preferably), both touch screen & key pad type are acceptable. The system should preferably have the facility of Impressive real-time zoomable, scrollable graphical visualization ofall historical data including 3D-optical spectra. • Display should be with improved reading precision through special backlit graphic touch screen display.
Power Supply	• 10-36VDC or 100-240VAC Power Supply. • The controller should be low power consuming with consumption of less than 5W.
Number of sensors to be connected	• Minimum 4 (Four) Sensors to be connected
Output Communication	• Galvanically Separated current outputs (0/4-20 mA) that can be assigned arbitrarily • USB-interface for data transfer, upgrading firmware etc. • It should be possible to download the data via the USB interface an extremely fast data exchange to USB memory stick.
Data Logger	• 2 GB RA M minimum or higher as suitable for the system • Internal integrated Data logger with minimum data memory for 5 years parameters recording & logs data recoding (when 8 parameters, logged every 15 minutes) • The controller should store the sensor configurations and calibrations and shall preferably depict the details when remotely accessed. • The controller should have Log file to record the diagnostics. • Data logger must have provision of a system memory (Non-volatile) to record data for at least one year of continuous operation. • Lifetime Free firmware update.

Parameter	Specification
Accessibility	• The system should be fully programmable with multiple levels of access control with help of Electronic-Key for data security and protection against non-authorized access to avoid any tampering or changes to the system configuration by unauthorized access
Status LED	• The system should have a status LED on Data logger terminal as well as on spectrophotometric probe that gives reliable and fast information regarding function and status of system. And the Controller/Probe must show a LED for diagnostic purposes on the front. These LED should show diagnostic alert about normal and malfunctions of the system at a glance.
Operating Temperature	• Ambient Conditions Operating temperature: -4°C to +50 °C • Storage temperature: -20 °C to +60 °C
Housing Material	• Non corrosive e.g. Acrylonitrile-Styrene-Acryl ester polymer / Powder Coated Aluminium Alloy / Stainless Steel 316
Protection Rating	• IP 66 / equivalent NEMA standard for controller • Integrated Lightning Protection. According to EN 61326 enhanced overvoltage protection for the entire system, implemented in each component • IEC/EN/UL/CSA 61010-1 IEC/EN/UL/CSA 61010-2-201 IEC/EN 60529
Essential features for the System	• System must have Automatic File Transfer features • Automatic Sampling for laboratory measurement Feature Onboard • PLC Based basic features for process control to comply regulatory guidelines • Camera separately in data uploading device and not in controller. • System must have display unit (size 5" or above preferably) both touch screen & key pad type are acceptable. The system should preferably have the Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra. • Remote system must be protected by a multiuser password protection. • Analyzer must provide self-adaptive, self-controlled data validation in real time. • Analyzer System must have unmatched event detection tools based on proven algorithms for real-time event detection that use

Parameter	Specification
	data streams from all connected probes separately and in combination • Analyzer System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection • Analyzer System must be optimized for use of multi-dimensional spectral data. • Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.

3.11. Specification for Non-Contact Radar type Flow Measurement System

Parameter	Specification
Site Conditions	
Ambient Temperature	From -5 to +60 ºC
Humidity	0 to 100 %
Altitude	0 to 2500 meter
Water Level Radar Type Sensor	
Sensor Type	Microwave non-contact sensor
Range	35 Meters
Resolution	1 mm
Accuracy	0.02 % FSO
Beam Angle:	≤ 16°
Velocity Measurement Sensor Non-Contact Radar Type	
Sensor Type	Microwave non-contact sensor
Measurement Principle	Bi-directional microwave velocity measurement
Detectable measurement range	0.3 to 15m/s (depending on flow conditions)
Accuracy	±0.01m/s or ±1% of full scale whichever is better
	(under normal flow conditions) < ± 0.5% of mean velocity reading
Resolution	1mm/s
Direction recognition	Bidirectional, Sensor shall have facility of bidirectional flow measurement
Measurement duration	5 to 240 seconds
Measurement interval	8 seconds to 5 hours
Beam angle	10 to 15 degree
Inclination	Angle measured directly
Distance to water surface	0.5 to 35 m or higher as per requirement
Sensors Digital interface	SDI-12/RS 485/ RS232 / MODBUS /USB
General Features	
Housing	Water resistant and weatherproof.
Protection from water	IP 67 or better
Protection	Lightening protection, over voltage, reverse power etc.
Power supply	To be powered by Solar Panel provided by bidder with DCP

Tools	Complete tool kit for operation and routine maintenance
Manuals	Full Documentation and maintenance manual in English
Accessories	Sensor Mounting support, cables and other accessories as required
Horizontal Mounting/Installation Arrangements	Below a bridge girder wherever available otherwise horizontal cantilever arrangement from a mast/wall/pedestal/SS tower to be provided. The Sensor shall be easy to dismount and replace in the event of malfunction.
Discharge Measurement Computing System	
Method	Velocity-Area method and refined using In-built Index-velocity rating. This system shall be fully integrated as flow meter to calculate the discharge based on the Velocity and the wetted area.
Accuracy	The accuracy of velocity measurement shall be 0.5% of mean velocity reading < ± 3 % of discharge reading (under normal flow conditions)
Resolution	The resolution of velocity measurement should be 1mm/s.

Central Server: The Central Server shall be provided as per the functional requirement of the OLMS by the bidder.

Objective:

As per the directive of Hon'ble High Court order dated 08/04/2024 and as per decision taken in 70th DPCC Board meeting, DPCC has to install 32 numbers online water quality monitoring system (OLMS) for online monitoring of the drains/river for different parameters like Measurement of Flow, pH, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Nitrogen (TN) (as Nitrates & Nitrites), Total Phosphorus (TP), Ammonia (NH3), Dissolved Oxygen (DO), Temperature, and Conductivity through installation of Online Continuous Effluent Monitoring System (OLMS) for all the 32 locations as mentioned in Annexure XI. This (OLMS) is supposed to monitor the desired data online with a continuous data transmission facility to the server of DPCC, in a 24X7 manner in exact compliance with the latest Guidelines & S.O.P. published by CPCB.

Scope of the contract:

The turn-key contract comprises Design, Engineering, supply, storage, Installation and commissioning of the Electro-Mechanical Equipment, trial Run for three month and comprehensive operation and maintenance for a period of five years after upon completionof trial run except in so for as the contract otherwise provides, the provision of all labour, materials, constructional plant, temporary works and everything (whether temporary or permanent in nature) required for completion and operation & maintenance so far as the necessity for providing the same is specified in or reasonably to be inferred from the contract.

IMPORTANT: - BIDDER CAN QUOTE THE RATES FOR ALL THE INSTRUMENTS OR SOME OF THE INSTRUMENTSAGAINST ONETENDER DOCUMENT. HOWEVER, SEPARATE PRICEBIDAND TECHNICAL BID SHOULD BE SUBMITTED FOR EACH ITEM CLEARLY MENTIONING THE ITEM CODE NUMBER, ITEM NAME ON THE TOP OF THE ENVELOPES WITH SENDERS NAME AND ADDRESS. THE DPCC RESERVES THE RIGHT TO ACCEPT THE TENDER IN FULL OR IN PART. THE BID FOR EACH ITEM SHOULD BE IN SEPARATE SHEETS/PAGES AND FOR THE SAKE OF IDENTITY, COMPILATION, INSTRUMENT/ITEM CODE NUMBER AND DESCRIPTION OF ITEM SHOULD BE WRITTEN ON THE TOP OF EACH BID. ITEMS-WISE TECHNICAL SPECIFICATION AND PRICE SHOULD BE IN SEPARATE SHEETS i.e. THERE SHOULD BE SEPARATE ENVELOPES

FOR EACH ITEMS CONTAINING TECHNICAL, PRICE BID & ITEMS WISE EMD; IN CASE,

BIDDERS DESIRES TO QUOTE MORE THAN ONE ITEM. **Those tenders do not comply the above instructions will not be considered.**

EVALUATION CRITERIA AND PROCEDURE

The bidder who fulfills the requirement specified under qualification requirement will be short listed.

The detailed techno-commercial evaluation to be carried out shall be restricted to these short listed bidders only.

After completing the techno-commercial evaluation, DPCC will notify the technically qualified bidders and the date of time for opening the financial bids of the technically qualified bidders.

EVALUATION AND COMPARISON OF FINANCIAL BID

Evaluation Procedure

The DPCC will evaluate the Financial Bids of technically qualified bidders.
The DPCC's evaluation of a bid will take into account the following factors:

Total cost of supply, installation & commissioning at the identified locations at Delhi of the equipment as below:

I. SUPPLY OF THE EQUIPMENT
1) For goods supplied
   a. Cost of goods off-the-self as per of Online Analysis Instruments (OLMS) For Drain/River supplied in Delhi-including all duties except GST.
   b. Cost of installation and commissioning
   c. Price of other incidental costs if any,
2) For the Goods/Central server
   a. Cost of Central server at DPCC Headquarter in case DPCC installed own Server/ use the Server of Supplier
   b. Commission, Incidental expenses as Networking, Data Communication Equipment and Accessories

II. COST OF TRAINING: Lump sum for Online Analysis Instruments (OLMS) For Drain/River
III. QUOTED PRICE (QP) : (I + II)
IV. Total O&M cost (Including insurance) for 05 years

GRAND TOTAL CONTRACT PRICE (III+ IV)

NOTE: Taxes and duties shall not be considered for the purpose of evaluation. The DPCC will evaluate and compare Bid as a complete package. The above details shall be submitted as per Annexure-XII – Part I and Part II.

Clarification on Financial Bid
For the purpose of examination, evaluation and comparison of the Financial Bid, the DPCC may at his discretion request the Bidder in writing to clarify his Financial Bid, but no change in the Bid Price or substance of the Bid will be sought, offered or permitted.

Withdrawal for deviations
Bidders may note that all deviations / variations and additional conditions etc. found in the bid, save those pertaining to any rebates, shall not be given effect to in evaluation and it will be assumed that the bidder complies to all the conditions of Bidding Documents. In case bidder refuses to withdraw, without any cost of the Owner, those deviations, the bid shall be rejected and the bid security of the bidder may be forfeited.

Tender Evaluation Criteria: The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened. After examination of the technical bid and price bid, DPCC will finalise the list of selected bidder for instruments. DPCC will issue the letter of award to the selected bidder for respective numbers of instruments for

delivery at respective locations/DPCC office.

The decision of DPCC will be final in case the quote received for any item is equal for the technically qualifying bidders, which will be governed by criteria, including number of such instrument supplied in past, proximity of the service centers or proximity and availability of service engineer to the place of installation, other factors required to be considered for optimized cost to the client on its life cycle cost analysis of 5 years.

DPCC shall evaluate all the proposals and the shortlisted proposals to issue work order for execution of work.

Supervisory Staff:

The Contractor shall engage an experienced and qualified Site Manager to be in day to day charge of the work. The Contractor shall, during working hours, maintain engineer and supervisors of sufficient training and experience to supervise the various items and operations of the work. Orders and directions given to such engineers and supervisors or other staff of the Contractor shall be deemed to have been given to the Contractor. The Contractor responsible for this work, by whatever designation he may be known, but who will be specified on award of the Contract shall at least once in a fortnight inspect the works.

TERMS OF PAYMENT:

A. Supply, Installation, Commissioning & one-year mandatory O&M of the equipment

(i) 60% value of the item shall be payable after successfully installation of the equipment of the OLMS.
(ii) The next 10% value of equipment shall be payable on successful completion and performance of the commissioning of equipment.
(iii) The next 10% value of the equipment shall be payable after successful completion of the Operation & Maintenance work of the entire installation for the first year.
(iv) Balance 20% (5% for each year = 20 %) value of the equipment shall be payable after efficient & successful completion of the Operation & Maintenance work of the entire installation for the subsequent 4 years.

B. Operation & Maintenance

Standards:

1. All Electro-mechanical supply of materials and or equipment under this specification shall be designed, manufactured, constructed and tested in accordance with latest revision of the relevant Indian Standards (IS), British Standards (BS). Hydraulic Institute Standards (HIS), CPHEEO manual, ISO and International Electro Technical Commission (IEC) publication unless otherwise stated.
2. All electro mechanical installation shall meet the requirement of latest revision of relevant code of practice. In addition, all electrical installations shall also meet the requirement of Indian Electricity Rules, 1956 and Indian Electricity Act, 2003 as amended upto date.
3. In addition, any rules or regulation applicable to the work shall also be followed and obeyed. In case of any discrepancy, the decision of the competent authority shall be final and binding upon the contractor.

Daily Operation of the OLMS:

1. The installation generally mean all electro-mechanical equipment and accessories supplied, installed, tested, commissioned with allied civil works by the contractor

2. Primary responsibility of the contractor is to operate and maintain the stated installation daily at the set time fixed by the department in good workmanship like manner. The set time is not firm and may vary.
3. The tenderers are advised to quote their rates for the specific item of comprehensive O&M considering all pros and cons of the situation which may eventually affect their rate. No claim what so ever shall be entertained by the department on such account.
4. The cost of all consumables, hardware and any goods which may be required during this period shall have to be provided by the contractor and the same shall also be taken into consideration while pricing the specific item of O & M.
5. Printed log book shall be provided by the contractor and all data, readings during operations of the OLMS shall have to be recorded by the contractor. The format of the log recording shall have to be got approved by the department before printing.
6. During such operation and maintenance by the contractor, the conditions of the equipment and accessories shall be monitored and if necessary, remedial measure shall be taken by the contractor at his own cost.

Day to day routine maintenance of the installation:

1. The contractor has to ensure the operativeness of the entire installation in the best conditions by supplying and or fixing any items or any goods required for the smooth and trouble free operation and maintenance of the OLMS.
2. All consumables, hardware like grease, petroleum jelly, CTC, CRC, HRC fuses, wire fuses, indicating lamps including tube / SV / MV lamps and other spares for electrical luminaries (ballast, igniter, capacitors etc.) shall be supplied by the contractor during the O & M phase of work. The cost for such repair and or replacement shall be included in the specific item of operation and maintenance of the station.
3. Cleaning of the OLMS with equipment including lighting shed to achieve maximum light output from the lighting installations shall also be the responsibility of the contractor within this contract.
4. The contractor has to carry out the routine maintenance in such a way so as to up-keep the installation at all time. Any damage and or defects observed in the performance of the each and the individual equipment and or in any instruments and accessories during the pendency of the operation and maintenance period under this contract shall be mend good and or set right by the contractor at his own cost.
5. The contractor has to contact and liaison with municipal engineers and or any responsible person of the municipality in case of any site need and or demand since the entire job is being done for the beneficiaries of the local area.
6. In the event of necessity at site, the contractor shall have to contact the local police or security authority for maintaining all sort of normalcy in the premises.

Damages due to faulty erection and or due to faulty operation & maintenance:

Any damages caused to the equipment and or any installations due to the faulty and or defective erection and or operation and maintenance made by the contractor, shall be made good by the contractor at his cost and risk. Decision of the department in this regard shall be final and binding upon the contractor. In the event of failure to repair, mend good or set right the defects observed within a reasonable period of time from such intimation by the department, the same shall be repaired, mend good as the case may be, at the risk and cost of contractor.

Comprehensive maintenances:

The contractor has to bear in mind that this operation and maintenance are exclusively comprehensive in nature. Any item / items / spares if any is / are required to be replaced / repaired / mend good for smooth and trouble free operation of the entire installations, the same shall be met

by the contractor at his cost. Decision on the requirement / replacements / mending good damages shall be taken by the department and binding upon the contractor.

Completion Period and payment schedule:

A. Payment of fees for Supply, installation and operation.

Construction, Operation & maintenance	**Time Allowed**	**Job to be completed for declaration of completion of the work**	**% of fee paid**	**Cumulative %**
1st Milestone	60 days	Supply, delivery, storage of the Equipment / Materials.	60 %	60 %
2nd Milestone	50 days	Installation, testing including pre- commissioning tests and commissioning of the system. (Including trial run for 30 days of entire installation as per requirement)	10 %	70%
3rd Milestone	365 days	Comprehensive mandatory efficient & successful Operation & Maintenance work of the entire installation for 1st years.	10 %	80%
4th Milestone	1460 days	Comprehensive mandatory efficient & successful completion of the Operation & Maintenance work of the entire installation for the subsequent 4 years.	5% for each year = 20 %	100%

B. Payment of fees for O & M.

S.No.	**Time Allowed**	**Particulars**	**% of Fee Paid**	**Cumulative %**
1	1460 days	Comprehensive mandatory operation & maintenance of the successfully OLMS with all associated equipment for 4 years.	6% for each quarter = 16 %	96 %
2	1825 days	Final completion certification of O & M period.	4 %	100%

Handing Over of Station:

On expiry/closure/termination of the Contract Agreement, stations shall be handed over to Committee in working condition to the satisfaction of Committee. Few or all the spares procured by the Operator and unused as on date of handing over may be purchased by the DPCC at his discretion provided Operator is able to provide reasonability of the costs of such spares. In addition the Operator shall provide consumables equivalent to three months consumption on expiry/closure/termination of the Contract Agreement without any extra financial implication.

Relocation of Station:

During contract period, if intends to shift OLMS from one location to another location, due to some reason functional or otherwise, Bidder shall shift the OLMS for which cost of shifting including dismantling, loading & transportation, reinstallation at new location and construction of foundation will be done by the bidder and bidder should also provide the cost of relocation separately.

Penalties:

During O&M period, in case of any OLMS failure, penalty will be charged by @ Rs.1,000/- (One thousand) per day per Analyzer after a grace period of three (3) continuous non-working days. The grace period of three (3) continuous non-working days shall be given only once per quarter (3 months).

For a failure of Data display on Board/panel, a penalty will be charged by @ Rs. 1,000/- (one thousand) per day after a grace period of three (3) continuous non-working days. The grace period of three (3) continuous non-working days shall be given only once per quarter (3 months), if it is installed at OLMS.

Total penalty per year during O&M period on account of above conditions shall be limited to 30% of total O&M charges for one year. Failing which defective/ malfunctioning analyzers/ system has to be replaced.

In case penalty in the year exceeds 30% as above, the Operator shall be required to replace the defective part with new ones at his own cost, failing which the shall have the right to terminate the O&M contract.

Free maintenance services including spares shall be provided by the Bidder during warranty period

Annexure-I

Tender Submission Letter

To
Delhi Pollution Control Committee,
4th & 5th Floor, ISBT Building,
Kashmere Gate, New Delhi-110006

Sub: TENDER DOCUMENT for *[insert project name]*

Ref: TENDER DOCUMENT No. .....

I/ We, the undersigned, offer to provide our services as per scope of work, as mentioned in TENDER DOCUMENT, to Delhi Pollution Control Committee. We are hereby submitting our bid, in a sealed envelope.

I/We, hereby declare that:

(a) We are submitting herewith our Bid, with the details as per the requirements of the tender, for your evaluation and consideration.
(b) We submitted the Bid Security Declaration Form in accordance with the tender Document.
(c) I/We have read carefully the terms and conditions of tender document attached hereto and hereby agree to abide by the said terms and conditions.
(d) The bid is unconditional.
(e) I/We undertake that documents submitted are genuine/authentic and nothing material has been concealed. I/We understand that the contract is liable to be cancelled, if it is found to be having obtained, through fraudulent means/concealment of information.
(f) We shall make available to the DPCC any additional information it may find necessary or require to clarify, supplement or authenticate the Bid.
(g) Until a formal agreement is prepared and executed, acceptance of this tender document shall constitute a binding contract between DPCC and us subject to the modifications, as may be mutually agreed to, between DPCC and us.
(h) We agree to keep this bid valid for acceptance for a period of *[insert number of days as per tender requirement]* from the date of opening the bid.

We understand that the DPCC is not bound to accept any tender that the DPCC receives.

Yours faithfully,

Authorised Signatory
(with Name, Designation, Contact no. and Seal)

Note: On the Letterhead of the Bidder.

Annexure-II

Bidder's Authorisation Certificate

To
Delhi Pollution Control Committee,
4th & 5th Floor, ISBT Building,
Kashmere Gate, New Delhi-110006

Sub: TENDER DOCUMENT for *[insert project name]*

Ref: TENDER DOCUMENT No. .....

Dear Sir,

I/ We {Name/ Designation} hereby declare/ certify that {Name/ Designation} is hereby authorised to sign relevant documents on behalf of the Agency in dealing with tender No. _____ dated.....He/ She is also authorised to attend meetings & submit technical & commercial information/ clarifications as may be required by you in the course of processing the Bid. For the purpose of validation, his/ her verified signatures are as under.

Thanking you,

Name of the Bidder: -

Authorised Signatory: - Verified

Signature:-Seal of the Organisation :-

Date:-

Place:-

Note: Please attach the valid power of attorney in favour of person signing this authorisation letter.

Annexure-III

Performa for Affidavit

(on non-judicial stamp paper of Rs. 100/-)

I_____Proprietor/Director/Partner of the Agency M/s._____do hereby solemnly affirm that our Agency M/s._____has never been blacklisted/debarred by any organization/office and there has not been any work cancelled against them for poor performance in the last three years reckoned from the date of invitation of Bid.

……
…… Name of the Bidder
……
…… Signature of the Authorised Signatory
……
…… Name of the Authorised Signatory

Place:_____
Date: _____

Annexure-IV

Information on Bidder's Organisation

S.No.	Particulars	Details
1)	Name of the Bidder	
2)	Address of the Bidder	
3)	Incorporation status of the Bidder / Associate (Relevant Certificate to be submitted in Technical Bid)	
4)	Year of Establishment	
5)	Valid GST registration No. (Copy of certificate to besubmitted)	
6)	Permanent Account No. (PAN) (Copy of PAN Card to besubmitted)	
7)	Name and Designation of the contact person to whom all references shall be made regarding this Bid	
8)	Telephone No. (with STD Code)	
9)	E-mail id of the Contact Person	
10)	Fax No. (with STD Code)	
11)	Website (if any)	

……

…… Name of the Bidder

……

…… Signature of the Authorised Signatory

……

…… Name of the Authorised Signatory

Place:_____
Date: _____

Annexure-V

Relevant Experience undertaken during the last 5 years

[table to be updated as per the requirement]

S. No.	Description of Project / Scope of the work	Locatio nof the work	Name of the Client	Actual value of the Project	Stipulated time for completion	Actua l time taken for completion
1.						
2.						
3.						

Supporting documents such as copies of documents as stipulated in the **Eligibility Criteria** to be attached.

……
…… Name of the Bidder

Signature of the authorised signatory: _____

Name of the Authorised Signatory**:** _____

Date:_____
Place: _____

Annexure-VI

Financial Information of Bidder's Organisation

Amount in Rupees.

S.No.	Parameters	FY …..
1	Turnover	

Note:

Copy of audited balance sheet and profit and loss account for the aforesaid financial years must be submitted.

……

…… Name of the Bidder

……

…… Signature of the Authorised Signatory

……

…… Name of the Authorised Signatory

Place:_____
Date: _____

Annexure-VII

FORM OF BID SECURING DECLARATION

Date: _____

Tender Reference No.: _____

Project Name: _____

To:

_____

We, the undersigned, declare that:

We understand that, according to your conditions, Bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for Bidding, or submitting Proposals in any contract with the Employer for the period of time of 6 (six) months from the date of notification, if we are in breach of our obligation(s) under the Bid conditions, because we:

(a) have submitted a non-responsive proposal; or

(b) have withdrawn our Bid during the period of Bid validity specified in the Letter of Bid; or

(c) having been notified of the acceptance of our Bid by the Employer during the period of Bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security in accordance with the Bid conditions.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) notification of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Name of the Bidder

Name of the person duly authorized to sign the Bid on behalf of the Bidder _____

Title of the person signing the Bid _____

Signature of the person named above _____

Date signed_____day of_____, _____

_____

Annexure-VIII

Form of Bank Guarantee for Performance Security

To
Delhi Pollution Control Committee
4th & 5th Floor, ISBT Building,
Kashmere Gate, New Delhi-110006

WHEREAS_____[Name and address of the Manpower Service Provider] (hereinafter called "the Agency") has undertaken, in pursuance of Contract No. _____ dated_____to provide the services on terms and conditions set forth in this Contract _____ [Name of contract and brief description of works) (hereinafter called the "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Agency shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Agency such a Bank Guarantee;

NOW THEREOF we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Agency up to a total of_____[amount of Guarantee]_____[in words], such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of_____[amount of Guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Agency before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the services to be performed there under or of any of the Contract documents which may be made between you and the Agency shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

The liability of the Bank under this Guarantee shall not be affected by any change in the constitution of the Agency or of the Bank.

"This guarantee shall also be operatable at our…….. Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation."

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs._____(Rs._____) and the guarantee shall remain valid till_____. Unless a claim or a demand in writing is made upon us on or before _____ all our liability under this guarantee shall cease.

Notwithstanding anything contained hereinabove"

A. Our liability under this guarantee shall not exceed Rs._____(Rupees_____).
B. This bank guarantee shall be valid up to_____.
C. We are liable to pay the guarantee amount or any part thereof under this bank guarantee only and only if you serve upon us, a written claim or demand on or before_____.

Signature and Seal of the Guarantor _____

In presence of

Name and Designation

1._____
(Name, Signature & Occupation)

Name of the Bank

Address

2._____
(Name & Occupation)
Date

Annexure IX

DRAFT CONTRACT

Supply, Installation and Commissioning of Online Continuous Effluent Monitoring System (OLMS) Instruments with 5 Years of Operation and Maintenance

I. CONTRACT

THIS CONTRACT (hereinafter called the "RC Contract/ Contract/ RC" is made on the_____day of the month of____, 2024 between **Delhi Pollution Control Committee (DPCC),** an autonomous regulatory body, having its office at 4th & 5th Floor, ISBT Building, Kashmere Gate, New Delhi-110006 (hereinafter called "Purchaser" or "DPCC" which expression shall, unless excluded by or repugnant to be context be deemed to include its administrators, successors and assigns) of the one part

And

_____*{Name of the Firm}* having its office at _____ (hereinafter called the "Supplier" which expression shall, unless excluded by or repugnant to be context be deemed toinclude its successors, legal assigns, executors or administrators) of the second part.

WHEREAS

a) the Purchaser had invited bids (vide its Tender no ..... dated_____for Supply of the goods to DPCC (hereinafter called "the Materials");

b) the Supplier, having represented to the Purchaser that he has the required experience and resources, has offered to provide in response to the aforesaid tender;

c) the Purchaser has accepted the proposal of the Supplier and agrees to buy and the Supplier agrees to supply the Materials in conformity with the specifications specified in Appendix A of this Contract and in accordance with the terms and conditions of this Contract.

NOW, THEREFORE, IT IS HEREBY AGREED between the parties as follows:

1. The following documents attached hereto shall be deemed to form an integral part of this Contract:
   a) The General Conditions of Contract;
   b) The Special Conditions of Contract;
   c) The following Appendices:

      Appendix A: Bill of Materials

      Appendix B: Letter of Award (LoA) issued by the PurchaserAppendix C: Copy of BOQ

Appendix D: Performance Bank Guarantee

2. The mutual rights and obligations of the Purchaser and the Supplier shall be as set forth in the Contract, in particular:

   a) the Supplier shall carry out and complete the supply of Materials in accordance with the provisions of the Contract; and

   b) the Purchaser shall make payments to the Supplier in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

All other terms and conditions of the tender document, clarifications, corrigendum and addendum if any shall form integral part of this Contract.

For and on behalf of **Delhi Pollution Control Committee**	For and on behalf of ***{Name of the Supplier}***
……. …….	……. …….

II. General Terms and Conditions

1. GENERAL PROVISIONS

1.1. **Definitions** Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

(a) "Applicable Law" means the laws and any other instruments having the force of law in India for the time being.

(b) "Supplier" means the firm/agency that will supply the Materials to the Purchaser under the Contract.

(c) "Contract" means the Contract signed by the Parties and all the attached documents listedin its Clause 1,i.e. the General Conditions (GC), the Special Conditions (SC), and the Appendices.

(d) "Materials" means supply of T-Shirts, Bags, Caps, Badges, Aprons and Bands by the Supplier to the Purchaser.

(e) "Effective Date" means the date on which this Contract comes into force and effect pursuant to Clause GC 2.

(f) "GC" means these General Conditions of Contract.

(g) "SC" means the Special Conditions of Contract by which the GC may be amended orsupplemented.

(h) "Government" means the Government of India.

(i) "Party" means the "Purchaser" or the "Supplier", as the case may be, and "Parties" means both of them.

(j) "Services" means the work to be performed by the Supplier pursuant to this Contract, as described in Appendix A hereto.

(k) "In writing" means communicated in written form with proof of receipt.

1.2. Law governing the Contract

This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the applicable laws of India, for time being in force as amended from time to time.

1.3. Subletting:

The Supplier shall not sublet, transfer or assign this contract or any part thereof without the prior written consent/approval of the DPCC. In the event of the Supplier contravening this condition, the contract is liable to be terminated and the Purchaser will be free to get the balance work or services under the contract executed at the risk and cost of the Supplier. The Supplier shall be liable for all the losses, damage which the DPCC may sustain in consequence or arising out the services being provided under the contract.

1.4. Notices:

1.4.1. Any notice, request or consent required or permitted to be given or made pursuant to this Contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered post/e-mail to such Party at the address specified in the SC.

1.4.2. A Party may change its address for notice hereunder by giving the other Party notice in writing of such change to the address specified in the SC.

2. Contract Period

The contract will be effective from the date of award of work or signing of this Contract. The Contract is deemed to have started from_____(hereinafter referred to as "Date of Start/Effective Date"). The Contract is for a period of 24 months. The Purchaser shall have the right to extend the term for subsequent year(s) based on the satisfactory performance of the Supplier and mutually agreed terms and conditions.

3. Contract Price

(a) The total value of the Project is as per Financial Bid and is Rs._____(Rupees_____ only) ("Contract Price").

(b) The Contract Price shall be paid as per the Financial Bid subject to any additions and adjustments thereto, or deductions there from, as may be made pursuant to the Contract.

(c) Prices charged by the Supplier for the Materials delivered and the related services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid.

(d) Prices will remain valid and firm during the Contract Period.

4. Scope of Contract

The Supplier undertakes to supply to the Purchaser, and the Purchaser undertakes to accept and pay for on the terms and conditions stipulated in this Contract.

The estimated annual quantities of the Materials are indicated at Scope of Work of this Tender Document. This RC is in the nature of a standing offer for items of quantity of which may or may not be ordered in full. The Purchaser will place work orders during the currency of this RC for meeting requirements of Materials as and when required. The Supplier is bound to supply any quantity at the contracted rate during the currency of this contract as per the provisions of contract.

5. Delivery

(a) Items mentioned in Scope of Work will be transported in bulk quantity to office of DPCC during the contract period;

(b) The delivery of the Materials shall be completed within the stipulated time period indicated in work order issued from time to time as and when required.

(c) Work order may include some or all the items, the Supplier shall submit the invoice for the items supplied as per work order on every such occasions.

(d) The Supplier has to deliver the Materials to the Purchasers' office without any extra cost irrespective of the quantities involved. The expected timelines are given below:

Activity	Expected Timeline
Supply of Material mentioned in Scope of Work	Within 10 days from the date of work order having been placed during the Contract Period or any other timeline as mentioned in the work order.

(e) The Supplier, if faced with problems in timely delivery, which are beyond their control at any time during the contract, shall immediately inform the Purchaser in writing, about the causes of the delay and tentative duration of such delay etc. The Purchaser, on receipt of such notice, shall analyze the facts at the earliest and may at its sole discretion, extend the delivery/ Contract Period as deemed reasonable.

(f) Any delay by the Supplier in the supply of Materials will make the Supplier liable to any orall of the following:

i. Forfeiture of Performance Bank Guarantee
ii. Imposition of Liquidated Damage
iii. Termination of the Contract for default

6. Payment Terms

(a) Supply, Installation, Commissioning & one-year mandatory O&M of the equipment

I. 60% value of the item shall be payable on receipt of materials at site.
II. The next 10% value of equipment shall be payable on successful completion of the commissioning of equipment.
III. The next 10% value of the equipment shall be payable after successful completion of the Operation & Maintenance work of the entireinstallation for the first year.
IV. Balance 20% (5% for each year = 20 %) value of the equipment shall be payable after efficient & successful completion of the Operation & Maintenance work of the entire installation for the subsequent 4 years.
V. O& M payment

(b) Completion Period and payment schedule:

A. Payment of fees for Supply, installation and operation.

Construction, Operation & maintenance	Time Allowed	Job to be completed for declaration of completion of thework	% of fee paid	Cumulative %
1st Milestone	60 days	Supply, delivery, storage of theEquipment / Materials.	60 %	60 %
2nd Milestone	50 days	Installation, testing including pre- commissioning tests and commissioning of the system. (Including trial run for 30 days of entire installation as per requirement)	10 %	70%
3rd Milestone	365 days	Comprehensive mandatory efficient & successful Operation & Maintenance work of the entire installation for 1st years.	10 %	80%
4th Milestone	1460 days	Comprehensive mandatory efficient & successful completion of the Operation & Maintenance work of the entire installation for the subsequent 4 years.	5% for each year = 20 %	100%

(c) B. Payment of fees for O & M.

S.No.	Time Allowed	Particulars	% of Fee Paid	Cumulative %
1	1460 days	Comprehensive mandatory operation & maintenance of the successfully build pumping station with all associated equipment for 4 years.	6% for each quarter = 16 %	96 %
2	1825 days	Final completion certification of O & M period.	4 %	100%

(d) In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to supply the Materials and remedy any defects therein in all respects and in conformity with the provisions of the Contract.

(e) The Purchaser hereby covenants to pay the Supplier in consideration of the supply of the Materials and remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed in the Contract.

(f) The Supplier's request for payment shall be made to the purchaser in writing, accompanied by invoices describing, as appropriate, the Materials delivered and related services performed, and by the required documents submitted pursuant to conditions ofthe Contract and upon fulfillment of all the obligations stipulated in the Contract.

(g) Payment will be made to the Supplier within fifteen (15) days on completion of supply and acceptance by the Purchaser for each supplies. The Supplier shall submit a pre-receipted bill/invoice along with satisfactory supply reports/ delivery challans duly signed by the Purchaser.

(h) DPCC has right to inspect/ cross verify/ ask for delivery receipts pertaining to any/ all consignment at the time of processing of invoice.

(i) All payments will be made in Indian Rupees only.

(j) Any penalties/ Liquidated Damages, as applicable, for delay and non-performance, as mentioned in this Contract, will be deducted from the payments for the respective supplies.

(k) Taxes, if any and as applicable, will be deducted/ paid as per the prevalent rules and regulations.

(l) Payment in case of those Materials which replacement or removal for defects or rejected shall be made only prescribed specification or alternate Materials have been delivered to the destination as required by the Purchaser.

(m) That in the event of the Supplier having failed to execute the Contract or any part of the Contract and /or failed to rectify any defect or any obligation within the Contract after issue of notice of 15 days, the Supplier shall be liable for damages and the Purchaser shall have the right to get it done on the risk and expenses of the Supplier.

(n) All payments under this Contract shall be made to the accounts of the Supplier as specified in SC.

7. Purchaser's Rights

(a) The Purchaser reserves the right to make changes within the Scope of the Contract at any point of time.

(b) The Purchaser reserves the right to place work order(s) during any period up to 24 months from the effective date of contract taking into account the same unit price for individual items as mentioned in the Financial Bid. The right of refusal of not getting the work done lies with the Purchaser.

(c) If the Purchaser does not procure any subject matter of procurement specified in the tender document/ Contract due to change in circumstances, the Supplier shall not be entitled for any claim or compensation.

(d) Since the Contract is for rates for various items, thus orders for items as per required quantities may be placed on the rates and conditions given in the Contract which will be valid for 24 months from the effective date of Contract.

(e) As per the requirements, from time to time, the Purchaser shall issue a work order to the Supplier for supply of various items in one or more categories. However, the Contract does not guarantee the Supplier to receive any minimum/ committed number of work order(s) from Purchaser.

(f) The work order shall specify the quantity of various items to be supplied along with delivery schedule.

(g) The Contract for the Supply (RC) can be repudiated at any time by the Purchaser, if the supplies are not made to his satisfaction after giving an opportunity to the Supplier of being heard and recording the reasons for repudiation.

(h) Before accepting the supply of Materials, the Materials will be inspected by the Purchaser. The Supplier has to ensure that the Materials supplied are in conformity with the specifications specified in the contract and the same can be checked during period of the Contract at the cost of the Supplier.

8. Quantity Variation Clause

The quantities mentioned in this contract are indicative only. The required quantities may vary to +/- 25%. However, the approved rate of each item as per Financial Bid and other terms and conditions shall remain unchanged during the period of the Contract. It will be entirely the discretion of the Purchaser to exercise this variation option or not. Additionally, the Purchaser reserves the right to not buy the quantities of some of the items that it does not require as stated in the Financial Bid.

9. Liquidated Damages / Penalty for delay

If the contractor fails to complete the work within the stipulated time or time extended by DPCC (if any), liquidated damages at the rate of 1% per week subject to maximum of 10% of the total work value shall be deducted / recovered from the contractor.

10. Defect Liability Period

The materials & work of the contractor shall be under 01 (One) year Defect Liability Period (DLP) from the date of work completion as decided by DPCC. Defect/s noticed during the defect liability period shall be rectified by the contractor without any cost to DPCC, failing which the Security Deposit of the Contractor shall be forfeited. The contractor may also be debarred from any future tendering in DPCC.

11. Performance Standards

(a) The Supplier has to supply the Materials to the Purchaser within the timelines mentionedin the tender during the Contract Period or the timelines mentioned in the work order.

(b) That in the event of the Supplier having failed to execute the Contract or any part of the Contract in accordance with the terms of the Contract or within reasonable time allowed by the Purchaser or shall be failing to perform the Contract or there shall be sub-standard performance on the Contract, the Performance Guarantee shall be forfeited and in that connection the decision of the Purchaser shall be final and binding.

(c) In case any counterfeit or sub-standard Materials supplied by the Supplier, the Purchaser,at its own discretion, can also get the Materials audited for a random check to discouragethe supply of counterfeit Materials supplied by the Supplier. Supply of counterfeit or sub-standard Materials will also attract termination of Contract and other suitable action against the Supplier.

12. Performance Security

The Supplier has furnished Performance Bank Guarantee No._____dated _____amounting to Rs._____/- (which is 10% of the total estimated value of the contract) and valid for a period of sixty (60) days beyond the date of completion of all contractual obligations. In case the contract period is extended further, the validity of Performance Bank Guarantee shall also be extended by the Supplier accordingly.

13. Specifications and Standards

(a) All items supplied shall strictly conform to the specifications laid down in the tender document/contract and wherever Materials have been required according to ISI/ ISO/ other applicable specifications/ certifications/ standards, those items should conform strictly to those specifications/ certifications/ standards. The supply shall be of best quality and description. The decision of the competent authority of the Purchaser whether the Materials supplied conform to the specifications shall be final and binding on the Supplier.

(b) The Materials supplied under this Contract shall conform to the standards mentioned in bidding document and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the country of origin of the Materials.

14. Rejection of Materials

(a) Materials not approved during inspection shall be rejected and will have to be replaced by the Supplier at his own cost within the time fixed by the Purchaser.

(b) The rejected Materials shall be removed from Purchaser's premises by the Supplier within Ten (10) days of intimation of rejection, after which Purchaser shall not be responsible for any loss, shortage or damage and shall have the right to dispose of such Materials at his discretion, at the Supplier's risk and on his account.

15. Packing

(a) The Supplier shall provide such packing of the Materials as is required to prevent its damage or deterioration during transit to reach destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation and open storage.

(b) The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as is required for such Materials.

16. Transportation

The Supplier shall be responsible for transport by any means viz. sea, rail, road or air and delivery of the material in the good condition to the Purchaser at destination. In the event of any loss, damage or any shortage the Supplier shall be liable to make good such loss and shortage found at the checking/ inspection of the Materials by the Purchaser. No extra cost on such account shall be admissible.

17. Assignment or Transfer of Obligation:

This Contract shall inure to the benefit of each of the parties and their respective successors and neither party shall otherwise assign the benefit or burden of this Contract to any others, without the previous written consent of the other party.

18. Force Majeure

(a) Notwithstanding the provisions stated above, the service provider shall not be liable for forfeiture of its performance security, penalty, or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the contract is the result of an event of force majeure.

(b) For purpose of this clause "Force Majeure" means an event beyond the control of the service provider and not involving the contractor/service provider's fault or negligence and not foreseeable. Such events may include, but are not limited to acts or the service provider either in its sovereign or contractual capacity, war or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

(c) If a Force Majeure situation arises, the contractor/service provider shall promptly notify DPCC in writing of such conditions and the cause thereof. Unless otherwise directed by the employer in writing, the service provider shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

19. Termination

(a) Termination on expiry of the Contract: The Contract shall be deemed to have been automatically terminated on the expiry of the Contract period unless the Purchaser has exercised its option to extend the Contract in accordance with the provisions, if any, of the Contract.

(b) Termination on account of Force Majeure: Either party shall have the right to terminate the Contract on account of Force Majeure, as set forth in this contract.

(c) Termination on account of Insolvency: In the event the Supplier at any time during the term of the Contract becomes insolvent or makes a voluntary assignment of its assets for the benefit of creditors or is adjudged bankrupt, then the Purchaser shall, by a notice in writing have the right to terminate the Contract and all the Supplier's rights and privileges hereunder, shall stand terminated forthwith.

(d) Termination for Default: The Purchaser may, without prejudice to any other remedy for breach of contract, by a written notice of default of at least thirty (30) days sent to the Supplier, terminate the Contract in whole or in part:

(i) If the Supplier fails to deliver any or all quantities of the Materials within the time period specified in the Contract or any extension thereof granted by Purchaser;

or

(ii) If the Supplier fails to perform any other obligation under the contract within the specified period of delivery of service or any extension granted thereof; or

(iii) If the Supplier, in the judgement of the Purchaser, is found to be engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the contract; or

(iv) If the Supplier commits breach of any condition of the contract.

(e) Termination for Delay: The Supplier shall be required to supply the Materials as per defined schedule in the workorder. If the Supplier fails to do so within 20 days, the Contract may be terminated by the Purchaser by giving thirty (30) days written notice unless the Purchaser has extended the period with levy of Liquidated Damages.

(f) Termination for Convenience

Purchaser, by a written notice of at least thirty (30) days sent to the Supplier may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated and the date upon which such termination becomes effective.

(g) Consequences of Termination: The Materials that are delivered at destination within seven (7) days after issue of the notice of termination to the Supplier shall be accepted by the Purchaser at the Contract terms and prices and paid for subject to other terms and conditions of this Contract. In all cases of termination herein set forth, the obligation of the Purchaser to pay shall be limited to the period upto the date of effective termination unless stated otherwise in this Contract. Notwithstanding the termination of the Contract, the parties shall continue to be bound by the provisions of the Contract that reasonably require some action or forbearance after such termination.

20. Indemnity

The Supplier shall indemnify, protect and save the Purchaser/DPCC against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from infringement of any law pertaining to patent, trademarks, copyrights etc. or such other statutoryinfringements in respect of all the Materials supplied by him.

Purchaser reserves the right to recover the cost towards any damage/loss caused due to the negligence on the part of the Supplier engaged.

21. Settlement of Disputes

21.1. **Amicable Settlement:** Performance of the contract is governed by the terms & conditions of the contract, in case of dispute arises between the parties regarding any matter under the contract, either Party of the contract may send a written Notice of Dispute to the other party. The Party receiving the Notice of Dispute will consider the Notice and respond to it in writing within 30 days after receipt. If that party fails to respond within 30 days, or the dispute cannot be amicably settled within 60 days following the response of that party, Arbitration clause mentioned hereunder shall become applicable.

21.2. **Resolution of Dispute:** All disputes arising out of this contract shall be referred to arbitration. Each party shall nominate one arbitrator and the two arbitrators shall then appoint one umpire before proceeding with the reference. Award shall be final and binding on both the parties. The Arbitration shall be governed under the Indian Arbitration Act 1996, the Arbitration and Conciliation (Amendment) Act 2015 (3 of 2016) or any statutory modifications or re-enactment thereof and rules made there under and for the time being in force shall apply to the arbitration proceeding under this contract.

22. Jurisdiction of Courts

Jurisdiction of courts for dispute resolution shall be New Delhi only.

III. SPECIAL CONDITIONS OF CONTRACT

SCC Clause No.	Ref. of GCClause No.	Amendments of, and Supplements to, Clauses in the GeneralConditions of Contract
1.	1.4	**Addresses:** **DPCC:** Delhi Pollution Control Committee 4th & 5th Floor, ISBT Building, Kashmere Gate, New Delhi-110006 Tel: +91-9717593521 **Supplier:** **(Contact Persons name and contact details)** …… …… ……
2.	2	Effective date of contract……
3.	3	The Contract Price is Rs._____(Rupees……) exclusive of allapplicable taxes and duties.
4.	9 (j)	Account Details of the Supplier: Name and Address of the Beneficiary:Bank: Branch: Address of the Bank: Account Number: Account Type: RTGS/NEFT/IFSC CODE: MICR NO:

Annexure X

INDEMNITY BOND FOR HANDING OVER OF ONLINE ANALYSIS INSTRUMENTS (OLMS) FOR DRAIN/RIVER INCLUDING ALL EQUIPMENT TO THE O&M CONTRACTOR

This Indemnity Bond is made this…….Day of 2024…….by a Company registered under the Companies Act, 1956/Partnership firm/Proprietary concern having its registered office at…… (Hereinafter called as ‒Contractor‖ or ‒obligator‖ which expression shall include its successors and permitted assigns)in favor of **DPCC** with Office at----------
- --------, which term shall include permitted assigns and successors, (hereinafter called ‒DPCC‖ which expression shall include its successors and assigns).

Whereas DPCC has awarded to the Contractor, a contract for O&M of Online Analysis Instruments (OLMS)for Drain/River located at----
----------, vide its Letter of Intent/Award Letter/Contract No……..dated……..(hereinafter called the ‒Contract‖), in the terms of which Contractor shall be responsible for the Equipment to be handed over to it by DPCC for the purpose ofperformance of the Contract (herein after called the ‒Equipment‖).

Now, therefore this Indemnity Bond witnessed as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at Rs. _____ (Rupees……..) to be handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep DPCC indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per details in the Schedule appended hereto.

2. That the Contractor is obliged and shall remain absolutely responsible for the safe custody of the Equipment at belonging to DPCC against all risks whatsoever till the Equipment are duly used in accordance with all terms of the Contract. The Contractor undertakes to keep DPCC harmless against any loss or damage that may because to the Equipment.

3. The Contract or undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the Equipment shall be utilized for any other work or purpose what so ever. It is clearly understood by the Contract or that non-observance of the obligation sunder this Indemnity Bond by the Contract or shall inter-alia constitute a criminal breach of trust on the part of the Contract or for all intents and purposes including legal/penal consequences.

4. That DPCC is and shall remain the exclusive Owner of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The Equipment shall at all times be open to inspection and checking by Project-in-Charge DPCC shall always be free at all time to take possession of the Equipment in whatever form the Equipment may be. If in its opinion, the Equipment are likely to been dangered, misutilised or converted to uses other than those specified in the Contract, by any act of omission or commission on the part of the Contractor; he find itself and under takes to comply with the direction or demand of DPCC to return the Equipment without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever then the Contract or here by agrees that the decision of the Project-in- Charge of DPCC as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contract or bind sit self and undertakes to replace the lost and/or damaged Equipment at it neither sow nor remedy that may be available to DPCC against the Contract or under the Contract and under this Indemnity Bond.

6. Now the condition of this Bond is that if the Contract or shall duly and punctually complies with the terms and conditions of this bond to the satisfaction of DPCC, then the above bond shall be void, but otherwise, it shall remaining full force and virtue.

In witness whereof, the Contract or has here unto set its hand through its authorized representative under the common seal of the company, the day month and year first above mentioned.

SCHEDULE NO.1

Particular of the equipment handedover	Quantity	Value of the equipment	Signature of Authorized person

Witness I

1. Signature
2. Name

For and on behalf of M/s…….

3. Address

Name
Signature
Designation
Authorized representative

Witness II

1. Signature
2. Name
3. Address

(Common Seal) (In case of company)

Annexure XI

List of proposed Locations of OLMS:

<table>
<tr><td>River Locations (14 Nos.)</td><td colspan="2">22 Nos. of Open drains which out falls in river Yamuna (18 Nos.)</td></tr>
<tr><td rowspan="11"><u>A. River Locations</u>: 06 Nos.
1. Palla
2. ISBT Bridge
3. ITO Bridge
4. Nizamuddin Bridge
5. Okhla Barrage
6. River Yamuna at Asgarpur (After confluence of Shahdara & Tuglakabad drains)</td><td>C. Drains</td><td>Current Status</td></tr>
<tr><td>1</td><td>Najafgarh Drain
1. U/s of Najafgarh Jheel
2. D/s of Najafgarh Jheel
3. D/s Keshopur STP
4. D/s Rithala/Rohini STP
5. Supplementary Drain before meeting Najafgarh Drain
6. Najafgarh Drain before meeting River Yamuna</td><td></td></tr>
<tr><td>2</td><td>Metcalf House Drain</td><td rowspan="9">Trapped</td></tr>
<tr><td>3</td><td>Khyber Pass Drain</td></tr>
<tr><td>4</td><td>Sweeper Colony Drain</td></tr>
<tr><td>5</td><td>Magazine Road Drain</td></tr>
<tr><td>6</td><td>Tonga Stand Drain</td></tr>
<tr><td>7</td><td>Civil Mill Drain</td></tr>
<tr><td>8</td><td>Moat Drain(Vijay Ghat)</td></tr>
<tr><td>9</td><td>Tehkhand Drain</td></tr>
<tr><td>10</td><td>Drain No. 14</td></tr>
<tr><td rowspan="12"><u>B. Proposed OLMS for Monitoring of Pollution Coming from other states:</u>
1. DD6(Singhu Border,Sonipat)-01Nos.
2. Bahadurgarh Drains-03Nos.
3. UP Drains meeting into Shahadra(Indrapuri, Sahibabad&banthla)-03 Nos.
4. Hindon Cut-01 Nos.</td><td>11</td><td>SEN Nursing Home Drain</td><td rowspan="12"></td></tr>
<tr><td>12</td><td>ISBT Drain(Qudsia Bagh/Mori Gate Drain)</td></tr>
<tr><td>13</td><td>Delhi Gate Drain/Power House Drain</td></tr>
<tr><td>14</td><td>Sonia Vihar Drain(On Eastern Bank of Yamuna)</td></tr>
<tr><td>15</td><td>Kailash Nagar Drain(On Eastern Bank of Yamuna)</td></tr>
<tr><td>16</td><td>Shastri Park Drain(On Eastern Bank of Yamuna)</td></tr>
<tr><td>17</td><td>Barapulla Drain</td></tr>
<tr><td>18</td><td>Maharani Bagh Drain</td></tr>
<tr><td>19</td><td>Jaitpur Drain</td></tr>
<tr><td>20</td><td>Tuglakabad Drain(Kalkaji drain merged in this drain)</td></tr>
<tr><td>21</td><td>Shahdara Drain</td></tr>
<tr><td>22</td><td>Abul Fazal Drain</td></tr>
<tr><td colspan="2">Total</td><td>32 Nos.</td></tr>
</table>

Annexure XII

(Part-I)
Summary of Bid Price

DESCRIPTION	**Value per Online Analysis Instruments (OLMS) for Drain/River**	**Value for 32 Nos. Online Analysis Instruments (OLMS) for Drain/River)**
I. SUPPLY OF THE EQUIPMENT		
1) For goods supplied a) Cost of goods off-the-shelf as per Online Analysis Instruments (OLMS) for Drain/River supplied in Delhi-including all duties except GST. b) Cost of installation and commissioning c) Price of other incidental costs (if any)		
Sub Total (a+ b + c)		
2) For the Goods/Central server/ Supplier's Server a) Cost of Central/Supplier's Server at DPCC Headquarter b) Commission, Incidental expenses as Networking, Data Communication Equipment and Accessories	xxx	
Sub-Total (a + b)	xxx	
II. COST OF TRAINING: Lump sum for this Project	xxx	
III. QUOTED PRICE (QP): (I + II)	xxx	
IV. Total O&M cost for five years as indicated Annexure-XII (Part- II)		
GRAND TOTAL CONTRACT PRICE (III+ IV)		

Note*:- The price to be quoted are exclusive of GST since GST will be paid as per actual.

(Part-II)

BID PRICE BREAKUP FOR O&M OF ONE Online Analysis Instruments (OLMS) for Drain/River for FIVEYEARS

Sl. No.	Year of O&M	Total Charges for the year Consisting of Security, Electricity, Communication, Man power, Spares and Consumable for O & M
1.	1st year	
2.	2nd year	
3.	3rd year	
4.	4th year	
5.	5th year	
TOTAL		

Annexure- XIII

CHECK LIST-1
(FOR SUBMISSION OF DOCUMENTS)

S.No.	Documents to be submitted as per eligibility criteria	**Documents submitted** (Yes/ No, along with Page Number of the document)	**Remarks** (In case documents **not** attached)
1.	Successfully completed the work for "**SITC of OLMS system** for **any 05 Water Quality parameters along with Flow (Radar** type) in **01 project** during **the last 05 years.**		
2.	Successfully **completed at least 03 years CMC/O&M for a minimum of 10 nos. of locations in** River/Drain/STP/CETP/ETP **during last 05 years** and Satisfactory completion performance certificate duly signed by Authorized Signatory.		
3.	Authorization from O.E.M. **by mentioning the Tender No. in the authorization certificate/letter for the quoted instruments/systems**, if the bidder is not an O.E.M.		
4.	Bidder or O.E.M. should be directly operational with office set up in India for a minimum of last 05 (five) years from the date of N.I.T.		
5.	Submit **a declaration on letter head with signed and stamped** that they are meeting the complete technical specifications as mentioned in the tender document.		
6.	Submitthe literature, catalogues, brochures for quoted instruments/systems, servers, software & hardware, solar panel and related accessories as requested in the tender documents.		
7.	Must comply each and every point of CPCB SOP https://cpcb.nic.in/upload/thrust-area/revised-GUIDELINES-final-sent-for-publication-on07.11.2014.pdf as per latest guidelines.		
8.	Provide a complete list of spares and consumables required for 05 (five) years and a certificate to be given by manufacturer that spare parts will be made available for five years.		
9.	EMD of Rs. 50 Lakhs (Rupees Fifty Lakhs only) must accompany the tender in form BG/DD/FDR. EMD is required to be submitted in original separately on or before the last date of submission of bid as per the NIT. Scanned copy to be submitted along with Technical Bid.		
10.	Minimum required average annual turnover in respect of Procurement of Supply, Installation, and commissioning of goods for the successful Bidder/ Bidders' Manufacturer in		

S.No.	Documents to be submitted as per eligibility criteria	**Documents submitted** (Yes/ No, along with Page Number of the document)	**Remarks** (In case documents **not** attached)
	the last three (3) years shall be minimum INR 20 Crore (Twenty Crore).		
11.	Submit Audited Balance Sheets of last 03 (three) financial years (2020-21, 2021-22, 2022-23) with auditor's certificate regarding annual turnover from contracting business in each year.		
12.	Submit Profit/Loss A/c for last 03 (three) financial years (2020-21, 2021-22, 2022-23), out of which the company should not be in loss formore than 01 (one) financial year.		
13.	Submit Valid GST registration certificate, Professional Tax (if applicable), Income Tax Returns for last 03 (three) financial years with "PAN Card" and Trade License.		
14.	Submit a written declaration in the form of the affidavit duly notarized as to correctness of the copies of all documents submitted and a declaration whether the bidder has been blacklisted/banned/debarred/penalized/ disqualified or not under any State/CentralGovt./PSU etc. on date of bid submission**.**		

Annexure- XIV : CHECK LIST - 2 (for Technical Specifications)			
S. No.	**DPCC SPECIFICATIONS**		**Bidder (Company Name)**
1	**Original Equipment Manufacture Qualification Criteria**		**Complied mentioning Pg. No. ___ of Document**
	Item	**Description of Requirement**	
1.1	Bidder or OEM Office	Bidder or OEM should be directly operational in India since last 2 years from the bid calling date.	
1.2	OEM Company Certificates	TUV/USEPA/EPA/MCERTS	
2	**Technical Specifications and Salient Features Regarding Online Water Quality Monitoring System.**		
i.	Should be capable of operating unattended over prolonged period of time.		
ii.	System should be UV-Visible double beam spectrometry.		
iii.	System should have multipoint calibration facility.		
iv.	System should be complied as per latest CPCB Direction.		
v.	System should be complied new SOP published by CPCB.		
vi.	Should produce analytically valid results with precision and repeatability.		
vii.	The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.		
viii.	The Analyzer should have inbuilt features for automatic water matrix change adaption.		
ix.	The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices.		
x.	Should have data validation facility with features to transmit raw and validated data to DPCC central server.		
xi.	Should have Remote system access from DPCC central server provisioning log file access.		
xii.	Should have provision for Multi-server data transmission from each station without intermediate PC or plant server.		
xiii.	Should have provision to send system alarm/sms/whatsapp/email to DPCC in case any changes made in configuration or calibration.		
xiv.	Should have provision to record all operation information in log file.		

xv.	For each parameter there should be provision for independent analysis, validation, calibration & data transmission.	
xvi.	Must have provision of a system memory (non-volatile) to record data for at-least one year of continuous operation.	
xvii.	Should have provision of Plant level data viewing and retrieval with selection of Ethernet, wireless, Modbus & USB.	
xviii.	The correlation/interpretation factor for estimating COD and BOD using UV-Visible Absorption Technique shall be regularly authenticated/ validated and details provided.	
xix.	Record of calibration and validation should be available on real time basis on DPCC central server from each location/parameter.	
xx.	Record of online diagnostic features including sensor status should be available in database for user friendly maintenance.	
xxi.	Expandable program to calculate parameter load daily, weekly or monthly basis for future evaluation with flow rate signal input.	
xxii.	Must have low operation and maintenance requirements with low chemical consumption and recurring cost of consumables and spares.	
xxiii.	System must support visualization of parameters data onboard which is real time and records on real time basis. The parameter files recorded on data logger of 4GB are non-editable to safeguard authenticity of parameters.	
xxiv.	Sensor should be operational in high Chloride applications.	
xxv.	Sensor and cable should be with IP68 rating and specially designed for submerged installations.	
xxvi.	MOC of Sensor should be SS316L with compressed air cleaning facility.	
xxvii.	Sensor must measure full spectrum scanning for each parameter at specific bands of multiple wavelengths and provides sum parameter for COD, BOD, TSS, pH, TN, TP, Not Mentioned etc.	
xxviii.	Extended life of xenon flash lamp in spectrophotometric sensor with minimum 1019 flashes should be available.	
xxix.	All the remote stations should be operational in a real time mode and DPCC central station should be able to access any remote station.	
xxx.	The remote stations should be field operational and tolerant to extreme environmental conditions in India, in high or low temperatures, high humidity coastal conditions and high temperature.	
xxxi.	The communication between Remote and DPCC Central Receiving station must be two-way communication system utilizing GPRS.	
xxxii.	Remote station should have built in GPS receiver for automatic position determination.	

xxxiii.	DPCC Central Receiving station (Installed by Not Mentioned) must have the capability to remotely configure all remote stations.	
xxxiv.	Multiple Component Analysis with Pattern Recognition & Library of Effluent Matrix Variant.	
xxxv.	Multiple Component analysis with Multi- Point Calibration for Total COD, BOD, TSS etc.	
xxxvi.	Individual parameter method analysis, Individual Calibration, Individual Validation without any coefficient calculation from one parameter to another.	
xxxvii.	Automatic Sampling during calibration as per published CPCB SOP must be featured as integral part of OLMS and every sample collection automatic real time monitoring must be part of data submission to DPCC and other agency with sample collection tag number and sample collection timeline. The sample must be collected as per USEPA/CPCB compliance and Not Mentioned in this direction must be submitted by bidder.	
xxxviii.	Online data acquisition, monitoring & control system through local & remote terminals, based on GSM/WiFi or any other suitable System, including Supply of Field Instruments for the OLMS.	
2.1	**Additional Technical Points:**	
i.	System should work on wavelength of 200-750nm and all analyses should have independent values.	
ii.	System should have UV Visible dual beam technology.	
iii.	System must have Automatic File Transfer features.	
iv.	Automatic Sampling for laboratory measurement Feature Onboard.	
v.	PLC Based basic features for process control to comply regulatory guidelines.	
vi.	Probes and stations must be accessible remotely from any suitable device from any standard web browser e.g. via PC, Tablet, Notebook or Smart Phone.	
vii.	System must have Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.	
viii.	System must have optimal display readability with Classic-, Day- and Night-Mode.	
ix.	Quality controlled and Not Mentioned status management of probes and stations must be available to eliminate the need for paper log books.	
x.	Analyzer must provide self-adaptive, self-controlled data validation in real time.	

xi.	It must ensure both sensitive and reliable alarm limits respectively setpoints for process control.	
xii.	Analyzer System must analyze noise, outliers and other combinations in real time to reliably detect any malfunction at an early stage.	
xiii.	Analyzer System must help to dramatically reduce false alarm rates.	
xiv.	Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.	
xv.	Analyzer System must have unmatched event detection tools based on proven algorithms for real-time event detection that use data streams from all connected probes separately and in combination.	
xvi.	Analyzer System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection.	
xvii.	Analyzer System must be optimized for use of multi-dimensional spectral data Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.	
3	**Sensors shall meet following specifications:**	
	Spectrometry Based multi-parameter probe:	
i.	No parts to be replaced within 3 years, no consumables required.	
ii.	System should have built-in spectral information for Drain/ River Water Quality data.	
iii.	No sample preparation required.	
iv.	Sensor shall be submersible in open channels or tanks.	
v.	No moving parts in contact with Drain/River water.	
vi.	Auto compensation of potential interference by turbidity/solids.	
vii.	All sensors should be IP68 and transmitter/display should be IP65.	
viii.	Auto diagnostic features	

3.1.	**Minimum specification for pH Sensor**		
S. No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	Integrated temperature measurement and compensation should be provided in the pH sensor.	
		The pH sensor should have galvanically separated input.	
		Calibration history should be stored automatically in the sensor.	
		Field Sensor calibration	
		Signal Output – Digital	
		Sensor Check function/Diagnostics should be available in the pH sensor	
		protection type: IP 68 for both Sensor and Cable	
2.	**Measuring Range**	Measuring Range: pH: 0 - 12 (Sensor should be designed for wastewater application)	
		Measuring: 0 to 60 Deg C	
3.	**Measuring Principle**	ISE - Potentiometric -combined, non-porous reference electrode	
4.	**Sensor Cable**	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	
5.	**Operating Temperature**	Temp Compensation: 0 to +60 Deg C	
6.	**Material of construction of sensor**	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
7.	**Calibration**	Calibrate pH meter with Certified (having international traceability) Buffer solutions of pH 4, 7, 9.2 & 10. Perform at-least two-point calibration within the expected range of the pH in the plant. For example, if pH is expected to be 7.8 then perform two points calibration with pH 7 and 9.2.	
8.	**Certifications**	TUV/MCERT/USEPA	
9.	**Reagent Free**	The pH combination electrodes should require very little maintenance and there should be no	

		electrolyte replacement.	
10.	**Voltage Protection**	Transient Voltage Protection should be integrated in the sensor	
11.	**Accuracy**	≤ 0.1 units of pH certified reference standard	
12.	**Resolution**	≤ 0.01 units of pH	
13.	**Response Time**	≤ 30 seconds	
14.	**Method of Measurement**	Potentiometric-Automatic compensation of Temperature	
15.	**Cleaning**	Automatic cleaning	
16.	**Operating Humidity**	5 to 95% non-condensing	
17.	**Interface connection to display**	sys plug (IP 67), RS485	
18.	**Power**	12/24V DC Nominal	
19.	**Protection Class**	IP68 for sensor	
20.	**Operating Pressure**	0... 400mbar	
21.	**Signal output**	Compatible with Data Acquisition System	
22.	**Transmitter output**	Default: 2 X 4-20 mA Additional optional: MODBUS RS485, HART, PROFIBUS.	
23.	**Transmiter Mounting**	Pole/wall mounted	
24.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
25.	**Diagnostics features**	System diagnostics: power shut down, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
25.	**Enclosure Material**	Stainless Steel with epoxy coating for Analyser	
26.	**Calibration frequency**	Once after every 2 weeks	
27.	**Tag plate**	SS Tag plate	

3.2	**Specifications for Biochemical Oxygen Demand (BOD) sensor**		
S.No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology	
		System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values.	
		System should have spectrophotometric probe made of SS316L/Titanium or equivalent.	
		Multi Parameter probe ideal for monitoring of BOD/COD/TSS in Municipal Wastewater.	
		The Sensor should have optimized function check referencing for excellent zero point and long-term stability.	
		The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum.	
		System should be UV-Visible Not Mentioneduble beam spectrometry	
		System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020	
		System should be complied as per latest CPCB Direction, SOP & Guidelines.	
		Should produce analytically valid results with precision and repeatability.	
		The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.	
		The Analyzer should have inbuilt features for automatic water matrix change adaption.	
		The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of	

		accumulating further calibration matrices.	
		For each parameter there should be provision for independent analysis, validation, Independent parameter calibration & data transmission.	
		Sensor and cable should be with IP68 rating and specially designed for submerged installations.	
2.	**Measuring Range**	0 - 200 mg/L(with possibility to check higher ranges)	
3.	**Accuracy**	+/- 2.0 % in reference solution.	
		(+/-) 10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.	
4.	**Reagent & Consumables Free**	The Sensor should not use any reagents and should be easy to use and operate without any running costs.	
		The sensor should completely be reagent free for operation.	
5.	**Measuring Principle**	UV-Visible double Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement,complete spectrum	
6.	**Measurement**	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant	
7.	**Operating Temperature**	Operating temperature: -4°C to +50 °C;	
		Storage temperature: -20 °C to +60 °C	
8.	**MOC**	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
9.	**Light Source**	Must emit UV and Vis wavelength of light.	
10.	**Sensor Cable**	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	
11.	**Inbuilt Cleaning**	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a predefined interval. Chemical cleaning is not recommended.	
12.	**Calibration**	Multipoint calibration for each spectrophotometric parameter	

13.	**Protection Rating**	Protection type: IP 68 for both Sensor and Cable	
14.	**Certifications**	TUV/MCERT/USEPA	
15.	**Automatic compensation cross sensitivities**	Turbidity / solids and temperature	
16.	**Interface connection to display**	MIL connector, IP 68, RS485, 12 VDC	
17.	**Operating Humidity**	5 to 95% non-condensing	
18.	**Pressure**	10 Bar	
19.	**Power**	12V/24V DC Nominal	
20.	**Signal output**	Compatible with Data Acquisition System	
21.	**Resolution**	≤ 1 mg/L or better	
22.	**Response Time**	≤ 60 seconds	
23.	**Protection**	Sensor IP-68 and Transmitter IP-67	
24	**Enclosure**	Stainless Steel with epoxy coating for Analyser	
25.	**Diagnostics features**	System diagnostics: power shutNot Mentionedwn, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
26.	**Calibration frequency**	Once in a month	
27.	**Transmitter output**	Default: 2 X 4-20 mA	
		Additional optional: MODBUS RS485, HART, PROFIBUS.	
28.	**Transmitter Mounting**	Pole/ wall mounted	
29.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
30.	**Surge Protection**	Inbuilt	
31.	**Tag Plate**	SS tag plate	

3.3	**Specifications for Chemical Oxygen Demand (COD) Sensor**		
S. No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	Continuous Effluent Monitoring of BOD, COD, TSS with UV-Vis Full Spectrum dual beam technology	
		System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values.	
		System should have spectrophotometric probe made of SS316L/Titanium or equivalent.	
		Multi Parameter probe ideal for monitoring of BOD/COD/TSS in Municipal Wastewater.	
		The Sensor should have optimized function check referencing for excellent zero point and long-term stability.	
		The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum.	
		System should be UV-Visible Not Mentioneduble beam spectrometry	
		System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020	
		System should be complied as per latest CPCB Direction, SOP & Guidelines.	
		Should produce analytically valid results with precision and repeatability.	
		The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.	
		The Analyzer should have inbuilt features for automatic water matrix change adaption.	

		The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of accumulating further calibration matrices.	
		For each parameter there should be provision for independent analysis, validation, Independent parameter calibration & data transmission.	
		Sensor and cable should be with IP68 rating and specially designed for submerged installations.	
2.	**Measuring Range**	0 - 300 mg/L(with possibility to check higher ranges)	
3.	**Accuracy**	+/- 2.5% in reference solution.	
		+/- 10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.	
4.	**Reagent & Consumables Free**	The Sensor should not use any reagents and should be easy to use and operate without any running costs.	
		The sensor should completely be reagent free for operation.	
5.	**Resolution**	≤ 1 mg/L or better	
6.	**Response Time**	≤ 60 seconds	
7.	**Measuring Principle**	UV-Visible is Not Mentioneduble Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum	
8.	**Measurement**	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant	
9.	**Operating Temperature**	Operating temperature: -4°C to +50 °C;	
		Storage temperature: -20 °C to +60 °C	
10.	**MOC**	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
11.	**Light Source**	Must emit UV and Vis wavelength of light.	
12.	**Sensor Cable**	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	

13.	**Inbuilt Cleaning**	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a predefined interval. Chemical cleaning is not recommended.	
14.	**Calibration**	Multipoint calibration for each spectrophotometric parameter	
15.	**Protection Rating**	Protection type: IP 68 for both Sensor and Cable	
16.	**Certifications**	TUV/MCERT/USEPA	
17.	**Automatic compensation cross sensitivities**	turbidity / solids	
18.	**Interface connection to display**	MIL connector, IP 68, RS485, 12 VDC	
19.	**Operating Humidity**	5 to 95% non-condensing	
20.	**Pressure**	10 Bar	
21.	**Power**	12V/24V DC Nominal	
22.	**Signal Output**	Compatible with Data Acquisition system	
23.	**Protection**	Sensor IP-68 and Transmitter IP-67	
24.	**Enclosure**	Stainless Steel with epoxy coating for Analyser	
25.	**Diagnostics features**	System diagnostics: power shutNot Mentionedwn, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
26.	**Calibration frequency**	Once in a month	
27.	**Transmitter output**	Default: 2 X 4-20 mA	
		Additional optional: MODBUS RS485, HART, PROFIBUS.	
28.	**Transmitter Mounting**	Pole/ wall mounted	
29.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
30.	**Surge Protection**	Inbuilt	

3.4	**Specification for Total suspended solids (TSS) sensor**		
S. No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	Continuous Effluent Monitoring of BOD, COD, TSS with UV-V is Full Spectrum dual beam technology	
		System should work on wavelength of 200-750nm as per the CPCB guidelines and all analyses should have independent values.	
		System should have spectrophotometric probe made of SS316L/Titanium or equivalent.	
		Multi Parameter probe ideal for monitoring of BOD/COD/TSS in Municipal Wastewater.	
		The Sensor should have optimized function check referencing for excellent zero point and long-term stability.	
		The Sensor should provide compensation of interferences by evaluation of the whole measured spectrum.	
		System should be UV-Visible Not Mentioneduble beam spectrometry	
		System should have unlimited multipoint calibration facility as per CPCB SOP published on CPCB website in July 2020	
		System should be complied as per latest CPCB Direction, SOP & Guidelines.	
		Should produce analytically valid results with precision and repeatability.	
		The instrument/Analyzer should be robust and rugged, for optimal operation under extreme environmental conditions, while maintaining its calibrated status.	
		The Analyzer should have inbuilt features for automatic water matrix change adaption.	
		The instrument / Analyzer should have onboard library of calibration spectras for different industrial matrices with provision of	

		accumulating further calibration matrices.	
		For each parameter there should be provision for independent analysis, validation, Independent parameter calibration & data transmission.	
		Sensor and cable should be with IP68 rating and specially designed for submerged installations.	
2.	**Measuring Range**	0 - 300 mg/L(with possibility to check higher ranges)	
3.	**Accuracy**	With Calibration: <1% of the measured value ±0.01 FNU/NTU+/-10% of Parameter value with reference to certified laboratory results or as per latest reference of published CPCB SOP/Guidelines, whichever is less.	
4.	**Reagent & Consumables Free**	The Sensor should not use any reagents and should be easy to use and operate without any running costs.	
		The sensor should completely be reagent free for operation.	
5.	**Resolution**	≤ 1 mg/L or better	
6.	**Response Time**	≤ 60 seconds	
7.	**Measuring Principle**	UV-Visible is Not Mentioneduble Beam Spectrophotometry with multipoint calibration from wavelength 200 – 750 nm, as per the CPCB Guideline, xenon flash lamp, 256 photo diodes, two beam measurement, complete spectrum	
8.	**Measurement**	Must be direct In-Situ/Submersible measurement in Outlet or Inlet of wastewater treatment plant	
9.	**Operating Temperature**	Operating temperature: -4°C to +50 °C;	
		Storage temperature: -20 °C to +60 °C	
10.	**MOC**	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
11.	**Light Source**	Must emit UV and Vis wavelength of light.	
12.	**Sensor Cable**	Integrated 15-meter cable (minimum) with arrangement to increase length as per site conditions	
13.	**Inbuilt Cleaning**	The sensor must have automatic mechanical cleaning facility with integrated system for cleaning at a	

		predefined interval. Chemical cleaning is not recommended.	
14.	**Calibration**	Multipoint calibration for each spectrophotometric parameter	
15.	**Protection Rating**	Protection type: IP 68 for both Sensor and Cable	
16.	**Certifications**	TUV/MCERT/USEPA	
17.	**Automatic compensation cross sensitivities**	turbidity / solids	
18.	**Interface connection to display**	MIL connector, IP 65, RS485, 12 VDC	
19.	**Operating Humidity**	5 to 95% non-condensing	
20.	**Pressure**	10 Bar	
21.	**Power**	12V/24V DC Nominal	
22.	**Signal output**	Compatible with Data Acquisition System	
23.	**Protection**	Sensor IP-68 and Transmitter IP-65	
24.	**Enclosure**	Stainless Steel with epoxy coating for Analyser	
25.	**Diagnostics features**	System diagnostics: power shutNot Mentionedwn, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
26.	**Calibration frequency**	Once in a month	
27.	**Transmitter output**	Default: 2 X 4-20 mA	
		Additional optional: MODBUS RS485,	
		HART, PROFIBUS.	
28.	**Transmitter Mounting**	Pole/ wall mounted	
29.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
30.	**Surge Protection**	Inbuilt	

3.5	**Specification for Total Nitrogen (TN)**		
S. No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	**Total Nitrogen Sensor Specifications:**	
		Integrated measurement for parameters compensation should be provided in the Total Nitrogen Sensor.	
		Calibration history should be stored automatically in the sensor.	
		Field calibration facility	
		Signal Output –Digital	
		Sensor Check function/Diagnostics should be available in the Total Nitrogen Sensor.	
		Protection type: IP 68 for both Sensor and Cable	
		Preferably built-in automatic sensor aperture cleaning assembly	
2.	**Measurement Principal**	Multiparameter Probe, Ion Selective Electrode, Common reference electrode non-porous / non-leaking reference electrode, two measuring electrodes, one compensation electrode	
3.	**Reagent Free**	The Ammoniacal Nitrogen and Nitrate Nitrogen electrodes should require very little maintenance and they should not require any add on chemical for continuous measurement.	
4.	**MOC**	The MOC must be SS316L / Titanium or equivalent to sustain the sensor in Sewage wastewater application.	
5.	**Sensor Cable**	Integrated 15-meter cable with arrangement to increase length as per site conditions	
6.	**Voltage Protection**	Integrated in the sensor	
7.	**Measuring Range**	Total Nitrogen: 0…500 mg/L (measurable up to 1000 mg/l considering the sewage waste water environment)	
8.	**Calibration**	Matrix adjustment against any reference value, multi-point calibration possible with multiple standard solution.	
9.	**Measurement Accuracy**	± 5 % of measured value ± 0.2 mg/l in standard solutions	

10.	**Operating Temperature**	Temp Compensation: 0 to +60 Deg C	
11.	**Certifications**	TUV/MCERT/USEPA	
12.	**Response time**	60 sec	
13.	**Power supply**	10 - 30 VDC	
14.	**Interface connection**	sys plug, IP 67, RS485	
15.	**Operating pressure**	0 - 1 bar	
16.	**Protection**	Sensor IP-68 and Transmitter IP-67	
17.	**Enclosure**	Stainless Steel with epoxy coating for Analyser	
18.	**Diagnostics features**	System diagnostics: power shutNot Mentionedwn, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
19.	**Calibration frequency**	Once in a month	
20.	**Transmitter output**	Default: 2 X 4-20 mA	
21.		Additional optional: MODBUS RS485, HART, PROFIBUS.	
22.	**Transmitter Mounting**	Pole/ wall mounted	
23.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
24.	**Surge Protection**	Inbuilt	

3.6	**Specification for Total Phosphorus Analyzer**		
S. No.	**Parameter**	**Specification**	
1.	**Measurement Range**	Auto-ranging: 0.0016 to 16.3 ppm (Total Phosphorus)	
CHEMICAL METHOD			
2.	**Phosphate**	Phosphomolybdenum blue	
3.	**Background color**	Compensated at the measurement wavelength	
4.	**Self-cleaning**	Programmable automatic chemical rinsing – piston cleaned every measurement	
MEASUREMENT MODE			
5.	**Batch measurement**	User-selectable 1 to 4 measurements per hour	
6.	**Sample streams**	Single or up to 3 streams – sequencing is programmable	
7.	**MEASUREMENT PERFORMANCE**		
8.	**Accuracy**	<±5 % of reading or ±0.005 ppm (whichever is the greater)	
9.	**Repeatability**	<Max. ±5 % of reading3 or ±0.030 ppm (whichever is the greater)	
10.	**Resolution**	0.001 ppm or 1 ppb	
11.	**Measurement units**	mg/l, ppm, ppb, µg/l	
12.	**Calibration**	2-point, automatic calibration, with the option of manual initiation. The interval between automatic calibrations manually selectable from four times a day to once per week	
ENVIRONMENTAL DATA			
13.	**Ambient Operating Temperature**	5 to 45 ºC (41 to 113 ºF)	
14.	**Ambient Operating Humidity**	Up to 95 % RH non-condensing	
15.	**Sample Temperature**	1 °C to 40 °C (32 °F to 104 °F)	
16.	**Sample Flow**	Continuous, 200 to 500 ml/min	
17.	**Sample Pressure**	5 psi maximum	
18.	**Sample Limitations**	Samples containing particles 100 microns (0.004 in) in diameter or larger may require pre-filtration	

MAINTENANCE			
19.	**Routine service interval**	12 months	
20.	**Reagent consumption**	0.75 ml of each reagent per measurement	
21.	**Display**	Color, TFT, liquid crystal display (LCD) with built-in backlight and brightness adjustment Diagonal display area 145 mm (5.7 in) 76800 pixel display	
MECHANICAL DATA			
22.	**Ingress protection**	IP31	
23.	**Sample connections**	Inlet: 6 mm OD push-fit x 1/4 in BSP elbow	
		Outlet: 10 mm OD push-fit x 3/8 in BSP elbow	
24.	**Materials of construction**	Electronics enclosure: 10 % glass loaded polycarbonate Main enclosure: Any Non-Corrosive material with laboratory report of NABL accredited lab.	
ELECTRICAL			
25.	**Power supply ranges**	100 to 240 V max. AC 50/60 Hz ± 10 %	
26.	**ANALOG OUTPUTS**		
27.	**Single and multi-stream**	6 isolated current outputs, fully assignable and programmable over a	
28	**analyzers**	0 to 20 mA range (up to 22 mA if required)	
ALARMS/RELAY OUTPUTS			
29.	**Single- and multi-stream analyzers**	One per unit:	
		Stop relay	
		Attention relay	
		Failure relay	
		Calibrate relay	
		Six per unit Fully user-assignable alarm relays	
30.	**Rating**	Voltage 250V AC 30V DC	
		Current 5A AC 5A DC	
		Loading (non-inductive) 1250 VA 150 W	

CONNECTIVITY/COMMUNICATIONS			
31.	**Ethernet connection**	Web server with ftp For real-time monitoring, configuration, data file access and email capability	
32.	**Data Handling, Storage and Display**		
33.	**Security**	Multi-level security: Operator and configuration Password or security switch	
24.	**Storage**	Removable Secure Digital (SD) card	
25.	**Trend analysis**	Local and remote	
26.	**Data transfer**	SD card or FTP	
27.	**Diagnostics features**	System diagnostics: power shutNot Mentionedwn, sensor failure, data transmission failure.	
		Parameter diagnostics: Calibration timeframe, calibration drift alert	
		High/low parameter permissible thresholds limit diagnostic	
		Maintenance and calibration schedule diagnostics	
28.	**Calibration frequency**	Once in a month	
29.	**Transmitter output**	Default: 2 X 4-20 mA	
		Additional optional: MODBUS RS485, HART, PROFIBUS.	
30.	**Transmitter Mounting**	Pole/ wall mounted	
21.	**Display**	Colour TFT LCD 640X480 pixels with LED backlight	
32.	**Surge Protection**	Inbuilt	
3.7	**Specification for Dissolved Oxygen**		
S. No.	**Parameter**	**Specification**	
1.	**Measuring Principle**	fluorescence	
2.	**Resolution**	0.01 mg/l O2	
3.	**Accuracy (standard solution)**	O2: +/- 0.02 mg/l or +/- 1 %* (*whichever is greater)	
4.	**Response time (t90)**	60 ... 0 sec.	
5.	**Reference standard**	saturated sodium sulfite solution	
6.	**Integrated temperature sensor**	0 ... 50 °C	
7.	**Operating temperature**	0 ... 60 °C	

8.	**Operating Pressure**	0 ... 7 bar	
9.	**Installation / Mounting**	submersed or in a flow cell	
10.	**Ingress Protection Class**	IP68	
11.	**Automatic Cleaning**	media: compressed air	
12.		permissible pressure: 2 4.5 bar	
13.	**Storage Temperature**	0 ... 60 °C	
3.8	**Specification for Conductivity**		
S. No.	**Parameter**	**Specification**	
1.	**Measuring Principle**	4-electrode, direct-contact	
2.	**Resolution**	1 µS/cm or 0.01 mS/cm or 0.1 PSU	
3.	**Accuracy (Standard Solution)**	0.1% of reading	
4.	**Automatic Compensation Instrument**	temperature	
5.	**Integrated Temperature Sensor**	-20 ... 90 °C	
6.	**Operating Temperature**	0 ... 70 °C	
7.	**Operating Pressure**	0 ... 20 bar	
8.	**Installation / Mounting**	submersed or in a flow cell	
9.	**Process Connection**	quick connect	
10.	**Flow Velocity**	0.01 m/s (min.)	
11.		3 m/s (max.)	
12.	**Automatic Cleaning**	media: compressed air permissible pressure: 2 ... 6 bar	
13.	**Storage Temperature**	0 ... 60 °C	
14.	**Conformity - EMC**	EN 61326-1	
15.	**Protection Class (-000)**	IP67	
16.	**Protection Class (-075)**	IP68	
3.9	**Specification for Ammonia**		
S. No.	**Parameter**	**Specification**	
	Measuring Principle	ISE	
1.	**Measuring Principle Detail**	NH4-N: ionophore membrane	
2.	**Resolution**	NH4-N,	
3.		0.01 at 0.02… 19.99 mg/l	
		0.1 at 20.0… 99.9 mg/l	

		1 at 100… 1000 mg/l	
		T: 0.1 °C	
4.	**Accuracy (Standard Solution)**	NH4-N: +/-3% or +/-0.5mg/l* (*whichever is greater)	
5.	**Response Time (T90)**	0 ... 60 sec.	
6.	**Operating Temperature**	0 ... 60 °C	
7.	**Operating Pressure**	0 ... 1 bar	
8.	**Installation / Mounting**	submersed or in a flow cell	
9.	**Flow Velocity**	0.01 m/s (min.), 3 m/s (max.)	
10.	**Automatic Cleaning**	media: compressed air permissible pressure: 2 ... 4 bar	
11.	**Storage Temperature (Electrode)**	2 ... 40 °C	
12.	**Storage Temperature (Sensor)**	2 ... 40 °C	
13.	**Protection Class (-000)**	IP67	
14.	**Protection Class (-075)**	IP68	

3.10.	**Specification for Smart Controller and Data logger**		
S. No.	**Parameter**	**Specification**	
1.	**Basic Requirement**	Controller should have the latest features of highly advanced Multi Parameter Controller having capability of handling at least 5 (five) Sensors in a single controller configuration for the parameters COD, BOD, TSS, pH, TN, TP and must be expandable for more parameters & sensors as and when required.	
		With Sensor ID recognition	
		High EMC interference immunity	
		Control unit should be latest touch screen display for the quick selection of software functions	
		Integrated lightning protection	
		With integrated back up controller function	
		The system should start automatically after the power is reset to the system (in case of power failure).	
		The system should have Service mode for cleaning /calibration/maintenance activities.	
		High-end IoT (Internet of Things) terminal preferably based on an industrial PC, minimum IP65 grade.	
		Large graphic display (minimum 9”) with backlight with adequate contrast for clear viewing in low ambient light and sunlit bright outNot Mentionedor lighting conditions.	
		Sensor and station management of up to 20 parameters: automatic cleaning, data logging, sample & calibration incl. history and multipoint calibration, sensor function check, user management, easy data transfer via USB-stick etc.	
		The Controller should preferably be able to power all the sensors and terminals or accessories attached to it without having to need any additional power sources in the system for increased protection against lightening and possible electromagnetic interference. The controller shall be low power operation and operable in 220VAC / DC (to be generated within	

		the controller itself).	
		IoT (Internet of Things) and M2M (Machine to Machine) connectivity: Minimum 1 Gb/s Ethernet, 300 Mb/s Wi-Fi 802.11a/b/g/n and optional worldwide HSPA+ 3G interface, remote control (http), data transfer into cloud via FTP, SSH and TML	
		Process interface to SCADA via: Modbus RTU/TCP, SDI-12, Profibus DP, analog 0/4-20mA and relay outputs	
		Integration of third party sensors via: analog 0/4-20 mA and digital (solid state) inputs, Modbus RTU/TCP	
		Easily extendable: 8 slots to customize I/Os, additional software features like online data validation and event detection optional	
2.	**Display**	With large (size 9" preferably), both touch screen & key pad type are acceptable. The system should preferably have the facility of Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.	
		Display should be with improved reading precision through special backlit graphic touch screen display.	
3.	**Power Supply**	10-36VDC or 100-240VAC Power Supply.	
		The controller should be low power consuming with consumption of less than 5W.	
4.	**Number of sensors to be connected**	Minimum 4 (Four) Sensors to be connected	
5.	**Output Communication**	Galvanically Separated current outputs (0/4-20 mA) that can be assigned arbitrarily	
		USB-interface for data transfer, upgrading firmware etc.	
		It should be possible to Not Mentionedwnload the data via the USB interface an extremely fast data exchange to USB memory stick.	
6.	**Data Logger**	2 GB RAM minimum or higher as suitable for the system	
		Internal integrated Data logger with minimum data memory for 5 years parameters recording & logs data	

		recoding (when 8 parameters, logged every 15 minutes)	
		The controller should store the sensor configurations and calibrations and shall preferably depict the details when remotely accessed.	
		The controller should have Log file to record the diagnostics.	
		Data logger must have provision of a system memory (Non-volatile) to record data for at least one year of continuous operation.	
		Lifetime Free firmware update.	
7.	**Accessibility**	The system should be fully programmable with multiple levels of access control with help of Electronic-Key for data security and protection against non-authorized access to avoid any tampering or changes to the system configuration by unauthorized access	
8.	**Status LED**	The system should have a status LED on Data logger terminal as well as on spectrophotometric probe that gives reliable and fast information regarding function and status of system. And the Controller/Probe must show a LED for diagnostic purposes on the front. These LED should show diagnostic alert about normal and malfunctions of the system at a glance.	
9.	**Operating Temperature**	Ambient Conditions Operating temperature: -4°C to +50 °C	
		Storage temperature: -20 °C to +60 °C	
10.	**Housing Material**	Non corrosive e.g. Acrylonitrile-Styrene-Acryl ester polymer / Powder Coated Aluminium Alloy / Stainless Steel 316	
11.	**Protection Rating**	IP 66 / equivalent NEMA standard for controller	
		Integrated Lightning Protection. According to EN 61326 enhanced overvoltage protection for the entire system, implemented in each component	
		IEC/EN/UL/CSA 61010-1 IEC/EN/UL/CSA 61010-2-201 IEC/EN 60529	
12.	**Essential features for the System**	System must have Automatic File Transfer features	
		Automatic Sampling for laboratory measurement Feature Onboard	

		PLC Based basic features for process control to comply regulatory guidelines	
		Camera Integration onboard in data logger for future regulatory compliance.	
		System must have display unit (size 9" preferably) both touch screen & key pad type are acceptable. The system should preferably have the Impressive real-time zoomable, scrollable graphical visualization of all historical data including 3D-optical spectra.	
		Remote system must be protected by a user-configurable firewall	
		Analyzer must provide self-adaptive, self-controlled data validation in real time.	
		Analyzer System must have unmatched event detection tools based on proven algorithms for real-time event detection that use data streams from all connected probes separately and in combination	
		Analyzer System must have capability of exploiting the enormous information contained in UV spectra which provide the most sensitive and stable data source for event detection	
		Analyzer System must be optimized for use of multi-dimensional spectral data.	
		Analyzer System must have configurable auto-correction of data based on threshold, outlier and noise analysis.	

3.11.	**Specification for Non-Contact Radar type Flow Measurement System**		
S. No.	**Parameter**	**Specification**	
Site Conditions			
1.	**Ambient Temperature**	From -5 to +60 ºC	
2.	**Humidity**	0 to 100 %	
3.	**Altitude**	0 to 2500 meter	
Water Level Radar Type Sensor			
4.	**Sensor Type**	Microwave non-contact sensor	
5.	**Range**	35 Meters	
6.	**Resolution**	1 mm	
7.	**Accuracy**	0.02 % FSO	
8.	**Beam Angle:**	≤ 16°	
Velocity Measurement Sensor Non-Contact Radar Type			
9.	**Sensor Type**	Microwave non-contact sensor	
10.	**Measurement Principle**	Bi-directional microwave velocity measurement	
11.	**Detectable measurement range**	0.3 to 15m/s (depending on flow conditions)	
12.	**Accuracy**	±0.01m/s or ±1% of full scale whichever is better (under normal flow conditions)	
		< ± 0.5% of mean velocity reading	
13.	**Resolution**	1mm/s	
14.	**Direction recognition**	Bidirectional, Sensor shall have facility of bidirectional flow measurement	
15.	**Measurement duration**	5 to 240 seconds	
16.	**Measurement interval**	8 seconds to 5 hours	
17.	**Beam angle**	10 to 15 degree	
18.	**Inclination**	Angle measured directly	
19.	**Distance to water surface**	0.5 to 35 m or higher as per requirement	
20.	**Sensors Digital interface**	SDI-12/RS 485/ RS232 / MODBUS /USB	
General Features			
21.	**Housing**	Water resistant and weatherproof.	
22.	**Protection from water**	IP 67 or better	
23.	**Protection**	Lightening protection, over voltage, reverse power etc.	
24.	**Power supply**	To be powered by Solar Panel provided by bidder with DCP	
25.	**Tools**	Complete tool kit for operation and	

		routine maintenance	
26.	**Manuals**	Full Not Mentioned documentation and maintenance manual in English	
27.	**Accessories**	Sensor Mounting support, cables and other accessories as required	
28.	**Horizontal Mounting/Installation Arrangements**	Below a bridge girder wherever available otherwise horizontal cantilever arrangement from a mast/wall/pedestal/SS tower to be provided. The Sensor shall be easy to dismount and replace in the event of malfunction.	
Discharge Measurement Computing System			
29.	**Method**	Velocity-Area method and refined using In-built Index- velocity rating.	
		This system shall be fully integrated as flow meter to calculate the discharge based on the Velocity and the wetted area.	
30.	**Accuracy**	The accuracy of velocity measurement shall be 0.5% of mean velocity reading	
		< ± 3 % of discharge reading (under normal flow conditions)	
31.	**Resolution**	The resolution of velocity measurement should be 1mm/s.	
32.	**Central Server**		

Annexure-XV

Format for Bank Guarantee for Earnest Money Deposit

(To be stamped in accordance with the Stamp Act)

To
Delhi Pollution Control Committee
4th & 5th Floor, ISBT Building,
Kashmere Gate, New Delhi-110006

Bank Guarantee No.

Dear Sir

In accordance with your Tender Reference No. _____ dated 22 July 2024, M/s _____, having its registered office at _____(hereafter called 'Bidder'), wishes to participate in the said bid for Supply, Installation, Commissioning of Online Continuous Effluent Monitoring System (OLMS) Instruments with 5 Years of Operation and Maintenance.

An irrevocable Financial Bank Guarantee (issued by a Scheduled Commercial Bank) against Earnest Money Deposit, amounting to Rs 50,00,000 (Rupees Fifty lakh only) and valid for 120 days, is required to be submitted by the bidder as a condition for participation in the said bid, which amount is liable to be forfeited on the occurrence of any contingency mentioned in the tender.

M/s_____in pursuance of their offer to Delhi Pollution Control Committee (hereafter called the 'Beneficiary') dated_____has expressed its intention to participate in the said bid and in terms thereof has approached us and requested us,_____Bank, to issue an irrevocable Financial Bank Guarantee against the Earnest Money Deposit of Rs 50,00,000 (Rupees Fifty lakh only) and valid for 120days.

We,_____Bank, having our Head office at_____, therefore guarantee and undertake to pay immediately on first written demand by Delhi Pollution Control Committee the amount of Rs 50,00,000 (Rupees Fifty lakh only) without any reservation, protest, demur and recourse in case the bidder fails to comply with any condition of the bid, or does not accept the order after issue of the purchase order, without the beneficiary needing to prove or demonstrate reasons for its such demand. Any such demand made by the said beneficiary shall be conclusive and binding on us irrespective of any dispute or difference raised by the bidder.

This guarantee shall be irrevocable and shall remain valid upto_____. If any further extension of this Guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions in writing, from_____on whose behalf the guarantee is issued.

In witness whereof the Bank, through its authorized officer, has set its hand stamped on this _____Day of_____2024 at _____

Name & Designation

(Name, Signature & Designation)

Bank Seal

Attorney according to Power of Attorney

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