



October 21, 2024

**Bid 24-12-15**

Subject: Invitation to Bid

Prospective Bidders

Sealed bids for furnishing items and services on *Ion Chromatograph (IC)* will be received in the Purchasing Office, located at 3600 First Avenue North, Birmingham, Alabama until *10:00 a.m., Tuesday, November 5, 2024*, at which time and place they will be publicly opened and read.

“Specifications and Conditions” and “Bid Forms” are attached, and all bids shall be F.O.B. destination, freight prepaid and no charge. One copy of bid should be returned, and the bidder should retain a copy.

The right is reserved to reject any or all bids submitted, to waive any informalities and technicalities, and to award to the bidder it is deemed will best and most economically serve the “Board’s” interests. The Board reserves the right to cancel this bid within thirty (30) days with written notice. The Board reserves the right to cancel the contract due to non-satisfactory performance or if the vendor is found to violate the terms and conditions or does not correct any violations of specifications within two days after given notice. The Board reserves the right to RE- BID.

Any bids that are mailed must be sent to 3600 First Avenue North, Birmingham, Alabama 35222, directed to the attention of the Interim Purchasing Manager and marked in the lower left-hand corner of the envelope as follows: Bids on “*Ion Chromatograph are due 10:00 a.m., Tuesday, November 5, 2024.*”

**If you are responding to multiple solicitations, please submit each bid response in its own sealed envelope to avoid potential shipping delays due to weather or other unforeseen circumstances. We encourage all bidders to mail their submissions well in advance. Please note that any bids received after the bid opening deadline will be automatically rejected.**

Yours truly,

LyTonja Levert  
Interim Purchasing Manager

## SPECIFICATIONS AND CONDITIONS FOR ION CHROMATOGRAPH

“Specifications & Conditions” for a fully automated/integrated ion chromatograph system with self-aligning intelligent autosampler and tray. The system must have an eluent generator to allow for isocratic runs. The system must be controlled by software/PC. The software program must be able to download data to a LIMS system (Accelerated Technology Laboratory’s LIMS - Sample Master). System must be able to perform both drinking water and wastewater samples (EPA methods 300 for Anions A & B (Fluoride, Nitrate, Nitrite, Sulfate, Phosphate, Chloride, Bromate, Chlorate, Chlorite, Bromide etc.)).

Equipment must be equal to or better than what is described in the “Specifications & Conditions“. The following minimum specifications must be met in order to qualify for consideration for the bid. Any variation or exception to these minimum specifications must be explained in detail and item-by-item.

### OVERVIEW OF IC SYSTEM:

Must be a modular ion chromatograph consisting of a pump, conductivity detector, conductivity cell, degas assembly, column compartment, column heater, suppressor, injector, and columns. Other modular detectors must be available to increase the flexibility of the system.

- 1) Must have inert, non-metallic PEEK (polyether ether ketone) fluidic components throughout the system to ensure solvent compatibility, corrosion resistance, and metal contamination-free chromatography.
- 2) Pre-made PEEK tubing assemblies must be available, with zero-dead-volume face-seal design, optimized lengths, and options for tubing i.d.
- 3) Eluent generation must be available as an option to be included with the system at time of purchase or added later.
- 4) Electrolytic suppressor must be able to be operated continuously and must be able to be operated in constant-current and constant-voltage modes. Suppressor regeneration must be carried out either chemically or electrolytically.
- 5) Instrument must permit field installation of an optional automation manager consisting of a 6-port or 10-port high pressure and/or two low pressure solenoid valves for post-column derivatizations or automated sample preparation operations such as online matrix elimination, online filtration, preconcentration, as well as large loop/small loop injections controlled by the data system.
- 6) Must allow for advanced single-range digital output with operating range to 15,000  $\mu\text{S}/\text{cm}$  full-scale and single-range analog signal output to 18,000  $\mu\text{S}/\text{cm}$ .
- 7) Must have leak sensor for laboratory safety and management to allow fast response to system leaks.
- 8) Must have a built-in vacuum degas assembly which provides in-line degassing of eluents ensuring reproducibility and protection of eluents from contamination and decomposition. Control of the degas operation must be able to be automated to sense when degassing is required.
- 9) The IC system must meet the requirements of EPA Method 300.0 Part A and Part B.

### PUMPING SYSTEM:

- 1) The pump(s) must be made of a nonmetallic material to reduce the possibility of corrosion because of coming in contact with acid and base eluents that are common with ion chromatography.
- 2) The pump(s) must be of a dual piston serial design to reduce maintenance cost and insure precision. The specifications of the pump must be consistent with industry standards, which must include precision, accuracy, ripple, maximum flow rate, maximum pressure, and gradient proportioning accuracy.

- 3) The pumping systems available must be either quaternary low-pressure mixing, isocratic, or capillary designs.
- 4) Must have as an option a single channel degasser for isocratic.

#### **ELECTROLYTIC ELUENT GENERATION:**

- 1) The Eluent Generator must be available as an option.
- 2) The Eluent Generator must be able to produce an unlimited number of linear, convex, concave, or inverse gradient profiles.
- 3) Concentration increments must be as low as 0.01 mmol/L which is required to optimize chromatographic peak resolution and optimize separation time.

#### **DETECTOR COMPARTMENT (DC):**

- 1) Must be thermally controlled and configurable to hold two valves. The valves can be either injection or column switching valves.
- 2) The detection section must be thermally controlled and able to house any detectors, conductivity (with or without suppressors) or electrochemical and automatically detectable by the software.
- 3) The automation section must be able to house, and automation manage or up to two IC Cubes.
- 4) The automation manager (analytical only) must house up to two high- pressure valves, 6- or 10-port, up to two inert low-pressure valves, 2 or 3 way, up to two reaction coils, dual loops for preconcentration, and must be field upgradable.
- 5) The fluidic flow path must be PEEK to prevent corrosion and contamination of samples.
- 6) Leak sensors must be provided for safety purposes.
- 7) Optional remote monitoring and diagnostic software notifies operator, lab manager, or other personnel when maintenance is required.
- 8) Systems supports wireless tablet control, providing the ability to have full, detailed system control and status wherever needed.
- 9) Manual loading of sample is possible

#### **CONDUCTIVITY DETECTORS (CD):**

- 1) The detector must be capable of operating in the suppressed or unsuppressed mode to insure flexibility.
- 2) Conductivity detector with digital signal processing (range 0-15,000  $\mu\text{S}$ ) and temperature-controlled conductivity cell.

#### **SUPPRESSION:**

- 1) Either electrolytic or chemical suppression of eluent for analyses must be available. An electrolytic suppressor reduces the operator's exposure to hazardous chemicals by not requiring sulfuric acid to be used as a regenerant and is desired.
- 2) The suppressor must be operated continuously without the need of switching motors and based on a single membrane-based ion exchanger.

- 3) Suppressor device must be able to suppress carbonate, hydroxide, or methanesulfonic acid eluents as required for EPA, ASTM, ISO, or other standardized methods.

#### **AUTOSAMPLER:**

- 1) Autosampler must be capable of performing full-loop and partial-loop injections.
- 2) The autosampler vials must be composed of polymeric material and have the ability to seal the sample from the atmosphere to reduce contamination.
- 3) Instrument must have optional software and hardware capability to analyze and automatically re-inject samples which exceed specified, user-selectable parameters such as peak area, peak height and amount. Method may include data system selection of a smaller loop, reduced direct injection volume (“partial loop” injection) or true “vial to vial” sample dilution.
- 4) Must have an all PEEK flow path and be compatible aqueous and reversed-phase solvents.
- 5) Must be capable of performing dilutions without additional hardware.
- 6) Must be capable of handling vials sizes of 10 mL and 1.5mL.
- 7) Must be capable of using polystyrene, polypropylene, or glass vials.
- 8) Must be configurable in either push or pull injection mode.
- 9) Capable of modifying a run sequence anywhere within the sampler during the run without interrupting analysis.
- 10) Must be capable of at least 1-99 injections per vial.
- 11) Must be capable of sampling a minimum volume of 10  $\mu\text{L}$  from a 300  $\mu\text{L}$  microvial or 20  $\mu\text{L}$  from a 500  $\mu\text{L}$  microvial.
- 12) Must have a variable volume range of 1-100  $\mu\text{L}$  in 0.1  $\mu\text{L}$  increments or 100-7500  $\mu\text{L}$  in 1  $\mu\text{L}$  increments.

#### **SOFTWARE AND COMPUTER SYSTEM:**

- 1) The software must be a 64 bit application for future upgradeability.
- 2) The software must be able to provide full automatic control of the process of analyzing samples. This must include acquiring data, quantitation, producing a report, and the option to upgrade to an incorporated excel like spreadsheet for report flexibility.
- 3) Standard curves must be generated using a variety of curve fitting routines.
  - a. Must be able to select curves with up to 6 point calibration curves
  - b. Must be able to select linear, quadratic, or cubic fit curves
  - c. Must be able to use weighing options for the calibration calculations.
  - d. Must be able to calculate the confidence intervals at different confidence levels.
- 4) The software must be able to automate integration updates without time consuming batch reprocessing of changes to an integration in a data set.
- 5) The Software must allow real time integration monitoring for an instrument operator to monitor real time progress.
- 6) The software must have the ability to customize the report format and content.
- 7) The instrument software must include self-diagnostic functions to readily identify proper installation and operation.
- 8) The software must have an option to predict column separations without additional experiments.
- 9) The system must be controlled by software/PC. The software program must be able to download data to a LIMS system (Accelerated Technology Laboratory’s LIMS - Sample Master Pro).

- 10) Must use Microsoft Windows 10 operating system.
- 11) Must have minimum of 16GB of RAM.
- 12) Must include at least 21" monitor.

#### **SERVICE, INSTALLATION AND TRAINING:**

- 1) Service contract for system and software for a period of no less 2 years, including annual PM.
- 2) The system must include installation of all equipment including checkout and verification of performance.
- 3) The system must include 2-day customer training and familiarization of all equipment and operating software at buyer's site.
- 4) Must include 5-day training (software & troubleshooting) at vendor training center for two (2). A training center must be available to allow users to have access for further training, of all equipment and operating software.
- 5) Service must be available from within a reasonable driving distance (4 hours) to allow for quick response.
- 6) Software phone support must be available during warranty at no cost to allow users quick access to trained software engineers.

#### **WARRANTY:**

##### Onsite repairs

- 1) All labor must be covered during warranty period, 1 year.
- 2) All parts must be covered during warranty period, 3 years.
- 3) Travel charges must be included during warranty period, 1 year.
- 4) Remote trouble shooting and support must be provided during warranty period.
- 5) An official company warranty statement must be included with the bid and must also be stated in the operator's manual.
- 6) The warranty must not have any limitations if the instrument is in operation 24 hours a day 7 days a week.

Must include an extended maintenance contract, after factory warranty expires, to cover labor, parts repair, travel, etc. as needed. The bid package will include a warranty for parts and labor for all supplied equipment for a minimum of one year. A service contract covering five years after warranty has expired must be included. Service for the instrument covered under warranty or service contract must be available by an on-site technical representative.

October 21, 2024

BID 24-12-15

**BID FORM**

LyTonja Levert, Interim Purchasing Manager  
The Water Works and Sewer Board of the City of Birmingham  
P.O. Box 830110  
3600 First Avenue North  
Birmingham, Alabama 35283-0110

Submitted below is our firm bid on items listed, which is in accordance with your "Invitation to Bid" and "Specifications and Conditions" for the Ion Chromatograph System dated **November 5, 2024**. Prices quoted are F.O.B. destination. The undersigned has read and understands said "Invitation to Bid" and "Specifications and Conditions" and expressly agrees to be bound by the terms thereof.

<u>QTY</u>	<u>DESCRIPTION</u>	<u>TOTAL COST</u>
1	IC as described in the "Specifications & Conditions" of <b>Bid 24-12-15</b>	\$_____

Is your system *equal to or better* than the system described in the "Specifications & Conditions"?  
Y\_\_\_\_\_ N\_\_\_\_\_

SUBTOTAL \$\_\_\_\_\_

PAYMENT TERMS/DISCOUNT \_\_\_\_\_

GRAND TOTAL \$\_\_\_\_\_

NOTE: Bids must be submitted in a sealed envelope, directed to the attention of the Purchasing Manager, and marked in the lower left-hand corner as follows: "Bid on IC due at 10:00 a.m., Tuesday, November 5, 2024."

DATE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE \_\_\_\_\_

WEBSITE \_\_\_\_\_

DELIVERY DATE ARO \_\_\_\_\_

\_\_\_\_\_  
(Print Name)

\_\_\_\_\_  
(Signed)

\_\_\_\_\_  
(Title)