Statement of Work
US Environmental Protection Agency
Region 7 Science and Technology Center

This procurement is for an Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) to analyze metals by EPA Method 200.7 and SW-846 6010D. The instrument may also be referred to as Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES). The vendor must provide a complete ICP system including software and autosampler that meets the requirements as stated below.

General System Requirements

- System must be fully compliant with US EPA methodology for EPA Method 200.7 and Method SW-846 6010D.
- The vendor must provide a new, current-production model and not a refurbished unit, demo unit, or otherwise previously used instrument.
- The vendor must provide the initial installation and training by a factory-trained service engineer.
- The ICP system must include a spectrometer, software, autosampler, chiller (if required), and all accessories needed for operation.
- The instrument must be a benchtop design with a utility-free rear, enabling all power, gas, water, and communications connections to be accessed from the side of the instrument.
- The total width of instrument should not exceed 26 inches, exclusive of autosampler and data system.
- The instrument must be safely operational with 120 cfm or less of airflow at the external ventilation system.
- The instrument must monitor gas flows, nebulizer backpressure, plasma stability, and safety interlocks. If any safety interlock is interrupted, the plasma should shutdown automatically.
- The instrument must be able to operate using 99.99% pure argon. 99.99% pure argon will decrease operating costs and allow more flexibility in sourcing laboratory gases which is important in these uncertain times.
- The torch must be mounted in a vertical position for highest matrix tolerance.
- The optics must be able to capture the axial and radial views of the plasma in a single measurement. Dual viewing of the plasma provides the required flexibility by speeding up analysis time and allowing trace and major concentrations of an element to be determined with the fewest possible interferences and wavelengths. The instrument must allow selection of viewing modes for any wavelength in a single method.

- The instrument must prevent the cool “tail” end of the axial plasma from being viewed by the optics in order to reduce interference.
- The instrument must include a quick-change torch module so the torch can be removed or changed quickly without excessive torch realignment.
- No tools should be required for torch or sample-introduction cassette removal.

Sample Introduction Requirements

- The instrument must include a compatible spray chamber and nebulizer.
- The instrument must include a computer-controlled 5-channel peristaltic pump with variable speed from 0-80rpm.
- Options for other sample introduction designs should be available from the manufacturer and/or from third-party vendors.
- The system must be compatible with a 6 or 7 port switching valve with sample loading loop for high speed sample analysis, such as the ESI FAST system or Agilent AVS (Advanced Valve System) system.
- The system must be able to run organic as well as aqueous matrices.

RF Generation Requirements

- The RF generator must be solid state and maintenance-free.
- The RF generator must operate at a frequency of 27MHz, a power output up to 1500 watts in both axial and radial viewing modes, and be controllable in 10-watt increments.
- The RF generator must have coupling efficiency of at least 75% and a power output stability of 0.1% or better.
- The RF generator must have a “free-running” design that keeps the power supply stable even when switching sample matrices.

Optical System Requirements

- The instrument must have a single detector covering a spectral range of at least 167 - 785 nm.
- The optical system must be able to measure axial and radial views of the plasma in a single measurement in order to save time and save argon consumption.
- The instrument must automatically adjust integration times for all wavelengths.
- The CCD detector must have anti-blooming protection on every pixel.
- The CCD detector must have a speed of at least 1MHz to provide a fast read-out and fast acquisition of results.

Autosampler Requirements

- The system must include a random access autosampler capable of 3 axes of movement.

- The autosampler must have room for up to four (4) standard-sized sample racks. For example, one standard-sized sample rack can hold twenty-one (21) 30mm diameter tubes.
- Include rinse solution reservoir to reduce carry-over.

Computer and Software Requirements

- The software must be able to be installed on an EPA-supplied computer, *not* a vendor-supplied computer.
- The software must be capable of running on Windows 11 on a 64-bit operating system.
- The software must be compatible with 21 CFR Part 11 compliance.
- Must include a “Universal Data Acquisition” or “IntelliQuant” mode which enables users to perform semi-quantitative analysis of a sample regardless of the elements that were originally selected. This can then allow analysts to do extra troubleshooting or at alternate wavelengths, saving time and resources.
- The software must allow for additional samples to be inserted during an analysis without restarting the sequence.
- Software must be able to save spectra and a copy of the exact method used for their acquisition for traceability requirements in audited laboratories.
- All analytical raw data must be stored on the hard disk/SSD and prevent tampering, per EPA requirements to support a complete data audit trail.
- Calibration curves must be stored and be able to be recalled or modified for later use.
- The software must have a library of analytical wavelengths containing all the major wavelengths for all elements, providing a list of preferred or recommended wavelengths.
- Data reprocessing on stored data should be possible without re-running the samples.
- The software must have the ability to perform spectral interference correction (IEC).
- The software must have fitted background correction ability.
- The software should allow the analyst to set QC protocol limits.
- The software must allow the user to view results while samples are being analyzed.
- The software must be able to create customizable results reports.
- Analytical data should be exportable in .csv and other formats to be transferred to LIMS.
- It must be possible to include the time and date on each sheet of data generated by the system printer.
- The software should provide periodic maintenance alerts.
- Searchable help files including step by step instructions on maintenance.
- Videos should be available to assist with system use and maintenance.

Customer Service Requirements

- The vendor must provide the initial installation and training by a factory-trained service engineer.
- Installation must be completed within 60 business days of delivery.
- The instrument manufacturer must provide a warranty of at least 12 months from the date of installation.
- Technical phone support must be available during business hours.
- The manufacturer must guarantee to produce consumables, parts, and support the instrument for at least 7 years after date of purchase.
- There must be the ability to purchase a service agreement from the manufacturer to have a service engineer perform repairs onsite when necessary.

Delivery Information

The ICP system will be delivered to EPA Region 7 STC within 90 business days of the award being granted. Installation must be completed within 60 business days of delivery. Warranty will begin once installation has been completed to EPA's satisfaction.

Delivery Location:
EPA Region 7 Science and Technology Center
300 Minnesota Avenue, Kansas City, KS 66101