

## **Advance Contract Award Notice (ACAN)**

**23-58091**

### **Fourier Transform Infrared FTIR Analyzer**

#### **1. Advance Contract Award Notice (ACAN):**

An ACAN is a public notice indicating to the supplier community that a department or agency intends to award a contract for goods, services or construction to a pre-identified supplier, thereby allowing other suppliers to signal their interest in bidding, by submitting a statement of capabilities. If no supplier submits a statement of capabilities that meets the requirements set out in the ACAN, on or before the closing date stated in the ACAN, the contracting officer may then proceed with the award to the pre-identified supplier.

#### **2. Definition of the requirement:**

The National Research Council (NRC) Energy, Mining and Environment (EME) has a requirement to the supply of one (1) Fourier Transform Infrared (FTIR) Spectroscopy Analyzer (hereafter referred to as the "Analyzer") suited for sampling and analyzing the concentration of certain species (detailed below) in the exhaust gas of heavy-duty internal combustion engines. The Analyzer will be used in the heavy-duty engine laboratory at NRC, Ottawa Montreal Road campus. The Analyzer must meet all of the mandatory technical requirements as specified below and must be compatible with the existing gas analysis and engine control system in the NRC laboratory.

#### **3. Criteria for assessment of the Statement of Capabilities (Minimum Mandatory Requirements):**

Any interested supplier must demonstrate by way of a statement of capabilities that its system meets the following requirements:

##### **I. Test Method and Configuration**

la. The Analyzer must quantitatively measure certain species present in the heavy-duty internal combustion engine exhaust described under "II. Test Species, Ranges, and Resolutions" below using Fourier Transform Infrared Spectroscopy.

lb. The Analyzer must be able to analyze spectra in the 600-4300  $\text{cm}^{-1}$  range at a resolution of 0.5  $\text{cm}^{-1}$  or better.

lc. The analyzer must include a humidity-protected beam splitter.

- ld. The Analyzer must record all data at the rate of 1 Hz or higher.
- le. The Analyzer must have the capability to measure at least 40 gases simultaneously.
- lf. The Analyzer must have the capability of storing quantitative and spectral data simultaneously and continuously.
- 1g. The Analyzer must have the ability to compensate for sample pressure fluctuations automatically.
- lh. The Analyzer must have means for data to be read by or transmitted to other data acquisition systems either through one or more of the following interfaces – web-based, analog signal, digital signal, TCP/IP protocol, or AK protocol.
- li. The Analyzer must be able to operate within an ambient temperature range of 15 to 40 °C.
- 1j. The Analyzer must be compatible with standard 19-inch rack mount.
- 1k. The Analyzer must have an accuracy within 2% of the full-scale reading.
- 1l. The Analyzer must use a gas cell made of 316 stainless steels.
- 1m. The Analyzer must use a gas cell with a path length of at least 10 metres.
- 1n. The Analyzer must allow the user to set the gas cell temperature to 191 °C.
- 1o. The Analyzer must have an infrared source which can be replaced by the user at the end of its service life.

## **II. Test Species, Ranges, and Resolutions**

IIa. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Methane (CH<sub>4</sub>)

Range: 0-2000 ppm

Resolution: ≤1 ppm

IIb. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Formaldehyde (HCHO)

Range: 0-50 ppm

Resolution: ≤1 ppm

IIc. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Acetylene ( $C_2H_2$ )

Range: 0-1000 ppm

Resolution:  $\leq 1$  ppm

IIId. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Ethylene ( $C_2H_4$ )

Range: 0-500 ppm

Resolution:  $\leq 1$  ppm

IIe. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Ethane ( $C_2H_6$ )

Range: 0-500 ppm

Resolution:  $\leq 1$  ppm

IIIf. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Dimethyl ether ( $C_2H_6O$ )

Range: 0-0.75%

Resolution:  $\leq 0.5\%$  of full scale

IIg. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Propane ( $C_3H_8$ )

Range: 0-100 and 0-1000 ppm

Resolution:  $\leq 1\%$  of full scale

IIh. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Propylene ( $C_3H_6$ )

Range: 0-1000 ppm

Resolution:  $\leq 1$  ppm

Ili. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Nitric oxide (NO)

Range: 0-1000 and 0-5000 ppm

Resolution:  $\leq 0.5\%$  of full scale

Ilj. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Nitrogen dioxide (NO<sub>2</sub>)

Range: 0-1000 and 0-5000 ppm

Resolution:  $\leq 0.5\%$  of full scale

Ilk. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Nitrous oxide (N<sub>2</sub>O)

Range: 0-500 ppm

Resolution:  $\leq 1$  ppm

III. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Ammonia (NH<sub>3</sub>)

Range: 0-1000 and 0-10000 ppm

Resolution:  $\leq 0.5\%$  of full scale

IIIm. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Carbon monoxide (CO)

Range: 0-1000 ppm, 0-5000 ppm, and 0-20%

Resolution:  $\leq 0.5\%$  of full scale

IIIn. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Carbon dioxide (CO<sub>2</sub>)

Range: 0-25%

Resolution:  $\leq 0.5\%$  of full scale

IIo. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Total hydrocarbon (THC)

Range: 0-10 and 0-10000 ppm

Resolution:  $\leq 0.5\%$  of full scale

IIp. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Water (H<sub>2</sub>O)

Range: 0-20% and 0-55%

Resolution:  $\leq 0.5\%$  of full scale

IIq. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Sulfur dioxide (SO<sub>2</sub>)

Range: 0-1000 ppm

Resolution:  $\leq 1$  ppm

IIr. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Toluene (C<sub>7</sub>H<sub>8</sub>)

Range: 0-300 ppm

Resolution:  $\leq 1$  ppm

IIs. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Methanol (CH<sub>3</sub>OH)

Range: 0-400 ppm

Resolution:  $\leq 1$  ppm

IIt. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Ethanol (C<sub>2</sub>H<sub>5</sub>OH)

Range: 0-275 ppm

Resolution:  $\leq 1$  ppm

IIu. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: 2-Propanol ( $C_3H_7OH$ )

Range: 0-500 ppm

Resolution:  $\leq 1$  ppm

IIv. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Methyl amyl ketone ( $C_7H_{14}O$ )

Range: 0-20 ppm

Resolution:  $\leq 1$  ppm

IIw. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Methyl ethyl ketone ( $C_4H_8O$ )

Range: 0-400 ppm

Resolution:  $\leq 1$  ppm

IIx. The Analyzer must measure the exhaust gas component with the range and resolution described as follows –

Component: Methyl isobutyl ketone ( $C_6H_{12}O$ )

Range: 0-100 ppm

Resolution:  $\leq 1$  ppm

### **III. Certification**

IIIa. At the time of delivery, the Analyzer must include hard copy of calibration certificate(s) for species and ranges described in “2. Test Species, Ranges, and Resolutions”

### **IV. Computer and software for test operation, data acquisition and analysis**

IVa. The Analyzer must include an internal or external computer with Windows 10 or 11 operating system, ethernet connection, USB port, and a primary high-resolution display of at least 10-inch size. The computer must also be able to connect to an external monitor and be able to connect to the internet using wi-fi network. This

computer must be loaded with perpetual license software for operating the Analyzer, data acquisition, data analysis, and post-processing. The contractor must provide backup for the software.

IVb. The Analyzer must allow NRC to add gas calibrations for measuring other species and ranges in addition to those listed in “2. Test Species, Ranges, and Resolutions” through electronic means such as the software, provided the calibrations for such species and ranges can be quoted by the Contractor.

## **V. Zero Air Generation System**

Va. The Analyzer must include a zero air generation system which can be used for purging of or conducting background checks on the Analyzer in place of gaseous nitrogen. NRC will provide compressed air supply.

## **VI. Heated Sample Line – 191 °C (25 feet long)**

VIa. The Analyzer must be provided with one 25 feet (7.62 metres) long heated sample line ( $\geq 191^{\circ}\text{C}$ ) with controller and all necessary accessories to connect to exhaust pipe.

## **VII. Heated filter**

VIIa. The Analyzer must be provided with a heated sample filter and controller which can be installed immediately downstream of the sampling probe.

## **VIII. Sampling system**

VIIIa. The Analyzer must be provided with a suitable sampling system which can extract sample gas through the heated sample line while maintaining and measuring appropriate flow rate of the sample gas, and maintaining temperature of the sample gas to at least  $191^{\circ}\text{C}$  before sending this gas into the Analyzer for analysis. This sampling system must remove particulate matter from the sample gas, and must provide means to switch Analyzer input flow between calibration and sample gas.

## **IX. Power supplies and cables**

IXa. The Analyzer and its accessories must include all power supplies, cables, and adapters and must be compatible to 120 VAC 60 Hz used in USA/Canada.

## **X. Non-standard valves and regulators**

Xa. The Analyzer must be provided with any non-standard valves and/or regulators required for assembly and operation of items I, V, VI, VIII, and VIII.

### **4. Applicability of the trade agreement(s) to the procurement**

- *Canadian Free Trade Agreement (CFTA)*
- *Canada-Chile Free Trade Agreement (CCFTA)*
- *Canada-Colombia Free Trade Agreement*
- *Canada-Honduras Free Trade Agreement*
- *Canada-Korea Free Trade Agreement*
- *Canada-Panama Free Trade Agreement*
- *Canada-Peru Free Trade Agreement (CPFTA)*

### **5. Set-aside under the Procurement Strategy for Aboriginal Business**

Not applicable

### **6. Comprehensive Land Claims Agreement(s)**

Not applicable

### **7. Justification for the Pre-Identified Supplier:**

The pre-identified supplier is the sole provider that meets all or the minimum essential requirements as described in Section 3.

The supplier system is compatible with current gas analysis and data acquisition systems at the National Research Council, Energy, Mining and Environment Research Centre.

### **8. Government Contracts Regulations Exception(s)**

The following exception(s) to the *Government Contracts Regulations* is (are) invoked for this procurement under subsection (d) - "only one person is capable of performing the work".

### **9. Exclusions and/or Limited Tendering Reasons**



The following exclusion(s) and/or limited tendering reasons are invoked under the:

- a. Canadian Free Trade Agreement (CFTA) – Article 513 (1) (b) (iii): due to an absence of competition for technical reasons;
- b. Canada-Chile Free Trade Agreement (CCFTA) – Article Kbis-16 (2) (c): necessary to protect intellectual property;
- c. Canada-Colombia Free Trade Agreement – Article 1409 (1) (b) (iii): due to an absence of competition for technical reasons;
- d. Canada-Honduras Free Trade Agreement – Article 17.11 (2) (b) (iii): due to an absence of competition for technical reasons;
- e. Canada-Korea Free Trade Agreement – referencing the WTO Protocol Amending the GPA, Article XIII (1) (b) (iii): due to an absence of competition for technical reasons;
- f. Canada-Panama Free Trade Agreement – Article 16.10 (1) (b) (iii): because of the absence of competition for technical reasons;
- g. Canada-Peru Free Trade Agreement (CPFTA) –Article 1409 (1) (b) (iii): due to an absence of competition for technical reasons;

**10. Ownership of Intellectual Property:**

Not Applicable

**11. Period of the proposed contract or delivery date:**

NRC is expecting the equipment to be delivered within the month of March 2024, based on the date of the contract. Delivery time frame is expected to take 6 months.

**12. Name and address of the pre-identified supplier:**

California Analytical Instruments, Inc.  
1312 West Grove Avenue,  
Orange, California 92865 USA

**13. Suppliers' right to submit a statement of capabilities:**

Suppliers who consider themselves fully qualified and available to provide the goods, services or construction services described in the ACAN may submit a statement of capabilities in writing, within 15 days, to the contact person identified in this notice on or before the closing date of this notice. The statement of capabilities must clearly demonstrate how the supplier meets each of the advertised requirements in Section 3.

**14. Closing date for a submission of a statement of capabilities:**

The closing date and time for accepting statements of capabilities is September 28, 2023 at 2:00PM EDT.

**15. Inquiries and statements of capabilities are to be directed to:**

E-mail: Name: Kacendra Dion  
Title: Senior Contracting Officer  
Organization: National Research Council Canada

Telephone: 438-324-8125  
E-mail address: Kacendra.Dion@cnrc-nrc.gc.ca