# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Supply of laboratory equipment for sample preparation and sample analysis and laboratory accessories**

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**Publication reference:** RORS00063/IRM/04

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offeredspecifications.

Lot 1 Laboratory equipment for sample preparation

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **1** | **Automatic sample divider 1pc**  Technical specification of the system with minimum required technical performance:  Material feed size must be <=30mm.  Feeding of the material must be through hopper with at least 60 L capacity and at adjustable speed.  Speed of rotation of dividing module must be adjustable.  Dividing module for batch processing must have 8 segments, with volume of at least 7500 ml for the individual segment.  Dividing module for continuous sampling must have one segment for sample and one reject container.  Different dividing modules must be able to operate in same machine.  Hopper and division modules must be made of stainless steel.  Electrical supply: 200-240 V, 50/60Hz |  |  |  |
| **2** | **Abrasive cutter 1pc**  Technical specification of the system with minimum required technical performance  The cutter must have dual blade system;  Motor Power: 4 kW  Electrical supply data: 200-240 V, 50/60Hz  Max Sample Width: more than 600 mm  Blade sizes min 250mm  Cut Capacity min. 100 mm  Blade speed min 2500 rpm  Minimum cutting width with dual blades 1,5mm  Lighting: LED  Interlock Hood Switch, Emergency Stop  Enclosed Motor  Filtering recirculation system  Cleaning nozzle  Sliding vise for sample clamping |  |  |  |
| **3** | **System for fast and precise cutting and grinding of petrographic samples 1pc**  Technical specification of the system with minimum required technical performance  Electrical supply data: 220 V, 50Hz  Motor Power min. 250W  Diamond Wheel Diameter min 200 mm  Precision Grinding ±5µm  Wheel Speed max 3000rpm  Precision micrometers for cutting and grinding off material from samples  Vacuum chuck or equivalent system for holding different-sized slides. |  |  |  |

Lot 2 – Laboratory equipment for analysis

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **1** | **Ion Chromatography Instrument (IC) - 1 piece**  - Automated system for ion chromatography - determination of anions and cations  - The possibility of upgrading the system to min. three-channel system (2 parallel analyzes at the same time),  - Possibility of using different detectors (conductometric, amperometric and UV VIS detector),  - Ability to upgrade all gradient options (HP gradient, LP gradient or Dosein Gradient),  - Full visibility of all parts of the system,  - Leak sensors,  - USB connectivity with instrument  **System components**:  2 high pressure pumps, 2 injectors, suppressor, CO2 degasser, 2 eluent degasser, 2 sample degasser, column thermostat, anion precolumn and column, cationic precolumn and column and conductometric detector with the following specifications: |  |  |  |
|  | **High pressure pump for eluents:**  **-** Two clips in a series  - Flow: 0.001-20mL/min  - Resolution: 0.001ml/min  - Reproducibility of eluent flow: <0.1%  - Maximum pressure: 35 MPa  **Injector:**  - The possibility of using loops of different volumes for injection  **Suppressor:**  - chemical and CO2 suppressor  - 100% resistant to organic solvents  **Column thermostat:**  **-** Thermostatic up to 2 columns  - Temperature range: from 0-80 °C  - Resolution: 0.1 °C  - Temperature stability: <0.05 °C  - Heating: up to 50 °C above ambient temperature  - Cooling: up to 20 °C below ambient temperature  **Column:**  - Column and pre-column for the determination of standard anions  - Column and pre-column for cation determination |  |  |  |
|  | **Detector:**  **Conductometric detector:**  - Conductometric detector with digital signal processing  - Measurement range: : 0-15.000 μS/cm  - Detector operating temperatures up to 50 °C  - Temperature stability: <0.001°C  - Detector noise: <0.1 nS/cm  - Baseline noise: <0.2 nS/cm  - Resolution: <0.005 nS/cm  - Flow cell volume: < 1µL  **Autosampler:**  **-** Autosampler with stand for at least 100 workplaces with cuvettes and lids (min. 200 pcs.)  - The possibility of using a carousel with 200 workplaces  - Possibility of upgrading with different inline sample preparation techniques: ultrafiltration, dialysis, matrix elimination, preconcentration, neutralization, cation removal, extraction, partial injection |  |  |  |
|  | **Software:**  - Automatic recognition of all system components in accordance with GLP  - Monitoring of system parameters, validity of calibration functions, service intervals, analysis flow monitoring, graphical display of results (chromatogram) and calibration curves  - Data processing and control, developing methods, creating analysis reports  - Statistical processing of results  - Data exchange: CSV, XML, Microsoft Office, LIMS  **Computer**:  - Computer with a monitor in accordance with the system requirements and the offered software. |  |  |  |
|  | **The Tenderer is obliged to provide:**  - Instrument installation and commissioning:  The Contractor should provide training for operation the instrument for 3 persons from the Contracting Authority. The training should be organized within maximum 5 days after comissioning. The training should last minimum three consecutive days, starting from 7 AM until 3PM.  Upon completion of the training, the Supplier is required to issue training Certificates to each trainee.  The Tenderer must be able to arrive within 24 hours if there is a failure of the instrument within the warranty period. user training  - IQ/OQ documentation and qualification of the system upon completion of installation by the manufacturer's authorized service technician  - Video with basic IC system maintenance (filter replacement, hoses, pump cleaning…)  - Regular annual service during the warranty period to be included in the price of the instrument |  |  |  |
| **2** | **pH/Eh/EC meter – 2 pieces**  **pH/U measurement:**  pH/U measuring range and resolution:  pH: 0-14; resolution: 0.001; accuracy: ±0.003  U: ± 1200 mV; resolution: 0.1mV; accuracy: ±0.2  Temperature:  NTC sensor: -5°C to +250°C; resolution: 0.1°C  Pt1000 sensor: -150°C to +250°C; resolution: 0.1°C  Possibility of pH calibration with up to 5 buffers, with automatic buffer recognition and automatic temperature correction  **Conductivity measurements**:  Conductivity measuring range: 0.1 µS - 500 mS  Resolution: 4 significant figures  Accuracy: ±0.5% for range: 0.1 µS - 16 µS  ±0.5% for range: 16 µS - 1 mS  ±1.0% for range: 1 mS - 500 mS |  |  |  |
|  | **Measurement modes for measuring the following parameters:**  - Cond. K ; TDS (Total Dissolved Solids); Salinity; ρ - resistance ; T - temperature  Measurement inputs:  -Input for combined pH/mV electrode  -Input for conductometric sensor  -Reference electrode input  -Inputs for temperature sensor Pt100**0**  **TFT display:**  Instrument memory: Storage of min. 10000 results with date, time and identification; memory of calibration data  **USB connection**  Ability to print reports in accordance with GLP/ISO  Data storage as PC/LIMS report and CVS file  It is necessary that the instrument has a built-in battery that enables its mobile application  **Conductometric sensor made of stainless steel**:  Cell constant: c = 0.5 cm-1  Pt1000 temperature sensor  Measuring range: 15 µS/cm - 250 mS/cm  Temperature range: 0 - 70°C  Conductometric standard 100uS/cm, 250ml  **pH electrode:**  Pt 1000 temperature sensor  Electrode holder  Calibration buffers (4.7 and 9 pH values) |  |  |  |
|  | **ORS sensor:**  Combined Pt ring electrode  Potential measurement range -2000mV - 2000mV  pH range 0-14 |  |  |  |
| **3** | **Turbidimeter – 1 piece**  Portable turbidimeter for laboratory and field use supplied with alkaline batteries, primary calibration standards, glass cuvettes and instrument manual.  **Measurement range**: 0 to 1000 NTU  **Measurement method**: ISO 7027 compliant nephelometric method (90°)  **Repeatability**: ±0.01 NTU or ±1% of reading, whichever is greater  **Accuracy**: min. ±5% of reading + straylight  **Light source**: LED, infrared at 850nm  **Light detector**: Photodiode  **Resolution**: 0.01 and 1NTU  **Operating conditions**: <90 % RH  < 50 °C  **Response time**: < 10 s in normal reading mode  **Power supply**: Batteries (1.5V AAA batteries)  100 - 240 V AC / 50/60 Hz  **Data logging**: min. 200 records |  |  |  |
| **4** | **DO (dissolved oxygen) meter – 2 pieces**  Portable dissolved oxygen analyser should have dual display (oxygen and temperature)  **Display**: TFT/LCD  **Operating principle**: luminescent (optical) dissolved oxygen technology  **Measuring range**: dissolved oxygen (0-20 mg/L);  oxygen (0-100%)  temperature (0-50°C)  **Accuracy**: ±2% of reading  **Resolution**: min 0.1  **Oxygen sensor**: Optical Sensor  **Sensor material**: Stainless Steel/Titanium  **Sensor response time**: < 30 seconds  **Calibration**: one or two point calibration  **USB or RS232 port** for connection to PC or laptop  The portable dissolved oxygen analyser should be supplied with all the accessories and consumables required for the calibration and running of the instrument: cables, membranes, protective holster with stand, battery.  Carrying case to be included. |  |  |  |
| **5** | **Burette with bottle-top dispenser – 2 pieces**  Digital bottle-top dispenser  Displaying the results in two decimal places  Volume measuring range: 5-50 ml  Capacity: 50ml  Material: glass  **Glass burette 1 – 4 pieces**  Volume of 25 ml, Class A precision.  Burette should be made of borosilicate 3.3 glass.  Features straight glass stopcock with PTFE key.  The volume content tolerances should conform to Class A of ISO 385.  Blue graduation marks with graduations 0.05ml.  **Glass burette 2 – 3 pieces**  Volume of 50 ml, Class A precision.  Burette should be made of borosilicate 3.3 glass.  Features straight glass stopcock with PTFE key.  The volume content tolerances should conform to Class A of ISO 385.  Blue graduation marks with graduations 0.1ml. |  |  |  |
| **6** | **Ion selective electrode** for determination of chlorides with bnc connection – **1 pair**  **Ion selective electrode** for determination of fluorides with bnc connection – **1 pair**  Ion selective electrodes should be supplied with connection cables and complete solutions.  Compatibile with Mettler Toledo Potentiometric Titrator |  |  |  |
| **7** | **Magnetic stirrer – 3 pieces**  Multi-Position Magnetic Hotplate Stirrer  Square type plate  LCD digital display  Temperature range max to 380°C  Number of stirring positions: 4-8  Speed range: 0-1500rpm |  |  |  |
| **8** | **Vortex Mini Shaker – 10 pieces**  Variable speed control up to 4000rpm  Two positions of operation:  Touch on or Hand free-continuous  Shaking orbit: 5 mm  Maximal tube capacity: Up to 50ml  Suitable for glass and plastic mixing tubes  Motor rating input/output: 58/10W  Power input/output: 1.2/0.8W |  |  |  |
| **9** | **Set of adjustable volume micropipettes**  **Set should contain micropipettes with:**  **Volume range 1- 10 mL – 5 pieces**  The micropipette must be supplied with calibration key, manual instruction and quality assurance form  Number of channels: 1  Volume range: 1-10mL  Handling: mechanical  Increments: 0.02mL  **Volume range 0.5- 5 mL – 5 pieces**  The micropipette must be supplied with calibration key, manual instruction and quality assurance form  Number of channels: 1  Volume range: 0.5-5mL  Handling: mechanical  Increments: 0.01mL  **Volume range 100-1000 µL – 5 pieces**  The micropipette must be supplied with calibration key, manual instruction and quality assurance form  Number of channels: 1  Volume range: 100-1000µL  Handling: mechanical  Increments: 1µL |  |  |  |
|  | **Volume range 20-200µL – 5 pieces**  The micropipette must be supplied with calibration key, manual instruction and quality assurance form  Number of channels: 1  Volume range: 20-200 µL  Handling: mechanical  Increments: 0.2µL |  |  |  |
| **10** | **Calcimeter – 2 pieces**  Glass apparatus used in the chemical analysis for determination of calcium carbonate in soil samples.  The apparatus should consists of 4 glass parts, a metal stand, clamps and a silicone hose. |  |  |  |

Lot 3 – Accessories and laboratory equipment

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **1** | **Set of standard solutions**  **The set should contaion:**  Multi-element standard solution 1 (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Tl, U, V, Zn) 10 µg/mL in nitric acid. Volume of 100mL in seald bottle. - **5 pieces**  Multi-element standard solution 2 (Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nb, Pr, Sc, Sm, Tb, Th, Tm, U, Yb, Y) 10 µg/mL in nitric acid. Volume of 100mL in seald bottle. - **3 pieces**  Multi-element standard solution 3 (Sb, Au, Hf, Ir, Pd, Pt, Rh, Ru, Te, Sn) 10 µg/mL in hydrochloric acid. Volume of 100mL in seald bottle. - **5 pieces**  Multi-element standard solution 4 (B, Ge, Mo, Nb, P, Re, S, Si, Ta, Ti, W, Zr) 10 µg/mL in water. Volume of 100mL in seald bottle. - **5 pieces** |  |  |  |
|  | Combined seven anion standard solution in water. Volume of 100mL in seald bottle. – **2 pieces**  Combined six cation standard solution in water. Volume of 100mL in seald bottle. – **2 pieces**  **The supplier should provide Certificate of quality for standard solutions.**  **Standard solutions should have Certificate of expiration date that is not less then 2027.** |  |  |  |
| **2** | **Certified reference materials**  (QC Check Sample, Water) – Trace metals: Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Ag, Sr, K, V, Zn – **2 pieces**  (QC Check Sample, Soil) – Trace metals: Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Se, Ag, Sr, K, V, Zn – **2 pieces**  **The supplier should provide Certificate of quality for certified reference materials** |  |  |  |
| **3** | **Set of reagents and solutions**  **The set should contain:**  Sulfate Powder Pillows reagents in sealed package for 10 ml sample, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Porphyrin 1 Powder Pillows reagents in sealed package for 10 ml sample, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Porphyrin 2 Powder Pillows reagents in sealed package for 10 ml sample, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Phenols cuvette test**,** for measuring range 0.05-5.00 mg/l, Pk/24 tests – **5 pieces**  Compatibile to Hach spectrophotometer  COD cuvette test for measuring range 0-1000 mg/l O2, Pk/25 tests – **5 pieces**  Compatibile to Hach spectrophotometer  COD cuvette test for measuring range 0-150 mg/l O2, Pk/25 tests – **5 pieces**  Compatibile to Hach spectrophotometer  Potassium hydroxide solution 45  % in volume of 50 ml, for BOD determination – **3 pieces** |  |  |  |
|  | Nitrification inhibitor B in volume of 50ml. Reagent for use in BOD measuring – **3 pieces**  Chloride reagent set, measuring range 0.1-25.0 mg/L Cl⁻ for 10 ml sample, Pk/100 – **3 pieces**  Compatibile to Hach spectrophotometer  Fluoride cuvette test , measuring range 0.1-2.5 mg/L F⁻, Pk/25 – **3 pieces**  Compatibile to Hach spectrophotometer  Ammonia Powder Pillows reagents in sealed package for measuring range 0.01-0.5mg/l, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Anionic Surfactants Cell Test, measuring range 0.05-2.00 mg/L, Pk/25 – **5 pieces**  Compatibile to Hach spectrophotometer  Cationic Surfactants Cell Test, measuring range 0.2-2.00 mg/L, Pk/25 – **5 pieces**  Compatibile to Hach spectrophotometer  Non-ionic Surfactants Cell Test, measuring range 0.2-6.00 mg/L, Pk/25 – **5 pieces**  Compatibile to Hach spectrophotometer  Sulfide Reagent Set, range 5-800ug/l – **5 pieces**  Compatibile to Hach spectrophotometer |  |  |  |
|  | Sulfite reagent set, burette titration, for measuring range 0 to > 500 mg/L SO3. Pk/100 – **3 pieces**  Compatibile to Hach spectrophotometer  Nitrite Powder Pillows reagents in sealed package for measuring range 0-0.30 mg/l, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Nitrate Powder Pillows reagents in sealed package for measuring range 0.3-30 mg/l, Pk/100 **– 5 pieces**  Compatibile to Hach spectrophotometer  Phosphate Powder Pillows reagents in sealed package for measuring range 0.02-2.50 mg/L, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Chromium Powder Pillows reagents in sealed package for measuring range 0.010-0.7 mg/L Cr (VI) , Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  Iron Powder Pillows reagents in sealed package for measuring range 0.02-3.00 mg/L, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer |  |  |  |
|  | Low Range Silica Reagent set for measuring range 0-1.6 mg/l, Pk/100 – **5 pieces**  Compatibile to Hach spectrophotometer  High Range Silica Powder Pillows reagents in sealed package for measuring range 1-100 mg/l, Pk/100 – **3 pieces**  Compatibile to Hach spectrophotometer  pH Buffer Accuracy solution (pH 4,7 and 10) 500ml plastic bottle of each solution – **5 pieces**  Conductivity Standard Solution Kit (147, 141 i 12.88 uS/cm), 250ml of each bottle – **5 pieces**  Ion Chromatography Eluent Concentrate Solution: Sodium Carbonate/Bicarbonate Concentrate (100X) 250ml  For anion eluent preparation – **3 pieces**  Compatibile to Thermo Fischer Dionex IC system  Ion Chromatography Eluent Concentrate Solution: Methanesulfonic Acid 500 ml  Diluent preparations for cation-exchange applications – **2 pieces**  Compatibile to Thermo Fischer Dionex IC system  **The supplier should provide Certificate of quality for each reagent and solution** |  |  |  |
| **4** | **Set of Ion Chromatography Consumables**  **The set should contain:**  IonPac Anion-exchange Analytical Column, 4 × 250 mm – **2 pieces**  Compatibile to Thermo Fischer Dionex IC system  IonPac Anion-exchange Guard Column, 4 × 50 mm – **2 pieces**  Compatibile to Thermo Fischer Dionex IC system  IonPac Cation-exchange Analytical Column, 2 × 250 mm – **2 pieces**  Compatibile to Thermo Fischer Dionex IC system  IonPac Cation-exchange Guard Column, 2 × 50 mm – **2 pieces**  Compatibile to Thermo Fischer Dionex IC system  Autosampler PolyVials and Caps for ion chromatograph autosampler, packs of 5 ml sample vials including filter caps – **3 pieces**  Compatibile to Dionex AS-DV Autosampler |  |  |  |
| **5** | **Equipment for ICP-MS Systems**  Nickel Sample Cone – **2 pieces**  Equal to iCAP Q Series ICP-MS Systems  Nickel Skimmer Cone – **2 pieces**  Equal to iCAP Q Series ICP-MS Systems |  |  |  |
| **6** | **Set of pipette tips**  **The set should contain:**  Standard polypropylene 10 ml Micropipette Tips with graduation lines packed in bags of 1000 non-sterile tips – **5 pieces**  Standard polypropylene 5 ml Micropipette Tips with graduation lines packed in bags of 1000 non-sterile tips – **5 pieces**  Standard polypropylene 1 ml Micropipette Tips with graduation lines packed in bags of 1000 non-sterile tips – **10 pieces**  Standard polypropylene 200µl Micropipette Tips with graduation lines packed in bags of 1000 non-sterile tips – **10 pieces**  Tips for all volumes should be suitable for Thermo Scientifics Micropippetes. |  |  |  |
| **7** | **Set of sample cells for spectrophotometer**  **The set should contain:**  Round glass sample cells with caps.  Set of 6 cells (4 with volume of 10mL and 2 with volume of 25ml (marks on 10, 20 and 25mL) – **10 pieces**  Compatible with Hach spectrophotometer  Square glass sample cells.  Set of 2 sample cells with volume of 10 mL – **10 pieces**  Compatible with Hach spectrophotometer |  |  |  |
| **8** | **Stirrer bar for magnetic stirrer**  Cylindrical, PTFE stirrer bars for stirring on magnetic and hot plate stirrers, 20x6mm – **30 pieces** |  |  |  |
| **9** | **Set of chemicals**  **The set should contain:**  HCl suprapur quality in glass bottle seald and protected from breaking in quantitiy of 1L - **3 pieces**  HNO3 suprapur quality in glass bottle seald and protected from breaking in quantitiy of 1L - **3 pieces**  HF suprapur quality in teflon bottle in quantitiy of 1L - **3 pieces**  HClO4 suprapur quality in glass bottle seald and protected from breaking in quantitiy of 1L - **3 pieces**  **The supplier should provide MSDS list about characteristics of chemicals** |  |  |  |
| **10** | **Nebulizer for AAS spectrophotometer**  Standard High Sensitivity Plastic Nebulizer Complete Assembly – **1 piece**  Compatibile with PinAAcle 900 AA series instruments**.** |  |  |  |