

STATEMENT OF WORK FOR CONTRACT PURCHASE OF AN INDUCTIVELY-
COUPLED PLASMA OPTICAL EMISSION SPECTROSCOPY (ICP-OES)
SPECTROMETER WITH AUTOSAMPLER

1. To support its academic mission of educating undergraduate U.S. Navy Midshipmen and conducting sponsored research in the field of chemical oceanography, the Department of Ocean and Atmospheric Sciences at the United States Naval Academy (USNA) requires an Inductively-Coupled Plasma Optical Emission Spectroscopy (ICP-OES) Spectrometer with an autosampler.

The ICP-OES Spectrometer will pass an aerosolized sample via a carrier gas (like Argon) through an inductively coupled plasma torch surrounded by a radio frequency (RF) coil with an oscillating magnetic field which, when sparked excites the carrier gas and ionized molecules and atoms from the sample creating a high-temperature plasma moving electrons to higher energy levels. When removed from the plasma, excited electrons fall back to their ground state and release excess energy as photons at specific wavelengths unique to each element. The emitted light is collected and processed into its component wavelengths using a spectrometer. The ICP-OES Spectrometer will be capable of measuring minor and trace elements at low-to-mid part-per-billion (ppb concentrations) depending on the matrix in natural waters (fresh to brackish waters) and soil and sediment digestates.

2. System Technical Specifications and Requirements: The ICP-OES Spectrometer will be operable using high-purity Argon as a carrier gas. It will come complete with software, an introduction system (torch, nebulizer, spray chamber), a chiller for cooling, and standards required for installation and initial operation. The system will come with an autosampler capable of performing analysis on multiple samples (60 or greater) using a pre-programmed method. The system will be able to be plumbed into existing ventilation systems with an air flow rate between 90-200 cfm. All components will be powered by 60 Hz, 110—120V or 200-240 VAC power. The complete system (minus chiller) will have a footprint of < 54" x 36" x 36" and can fit on a benchtop. The chiller will be a floor mounted unit with a footprint of < 16" x 30" x 24". System software will be compatible with Windows 11 and will be licensed for operation of 3 or more computers. All freight charges and shipping will be included in system cost. System delivery will come with a minimum of 2 days of vendor supported installation and training for 3 or more users.