

# STATEMENT OF WORK

## Test and characterization of a microdrill, LDMS prototype testing October 7, 2015

PR: 4200568935

### Background

- The MACROS project has a requirement for a microdrill component for acquisition of a powdered sample from a rock. The microdrill must be compatible with solvent extraction and therefore impart no measureable contamination to the liquid sample extract.
- The extract will then be presented at the focal plane of a laser desorption/ionization time-of-flight mass spectrometer (LD-TOF-MS), at the prototype level for the purposes of this requirement, and sample analysis of pre-extraction powders, post-extraction powders, and extracted (dissolved and redeposited) organics is required.

### Scope

The contractor:

- Shall test the performance of a set of candidate drill bits
- Shall conduct sample analyses on liquid residues, rock chips, and acquired powders with a prototype LD-TOF-MS
- Shall contribute to the requirements definition and integration of the LD-TOF-MS prototype with an interface module, as supplied by GSFC

### Requirements

The contractor will:

- test the powdering efficiency of a set of candidate drill bits
- provide drilled powders for imaging analysis at GSFC
- provide drill bits for contamination characterization
- provide a drill bit prototype, based upon volumetric sample requirements as determined by the project
- provide mechanical design and fabrication expertise in support of extraction module and interface module prototype development
- In addition, the contractor will be expected to attend weekly project meetings, either by telecon or in person

Year 1: Total estimated LOE: 575 hrs.

### Deliverables or Delivery Schedule

- Drill performance as a function of rock mineralogy will be completed by June 30, 2016

**Period of Performance**

- The period of performance for this requirement will begin ARO through June 30, 2016.