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JUSTIFICATION FOR OTHER THAN FULL AND OPEN COMPETITION (JOFOC)

(In accordance with Federal Acquisition Regulation (FAR) 6.3 – Other than Full and Open Competition)

1. **This document is a justification for other than full and open competition prepared by NASA's Goddard Space Flight Center (NASA's GSFC):**

   GSFC requests authorization to award a follow-on contract for The Measurement of Pollution in the Troposphere (MOPITT) Science Investigator-led Processing System (SIPS) in support of the Earth Science Data and Information System (ESDIS) Project. This justification documents the Government's determination to use other than full and open competition to perform the continuation of science data product generation from the MOPITT instrument as authorized by NASA's Headquarters (HQ) Science Mission Directorate (SMD), consistent with the recommendations of the Earth Science Senior Review 2013.

2. **The nature and/or description of the action being approved:**

   GSFC proposes a follow-on 5-year cost-type contract (one base year and four 1-year options) with the National Center for Atmospheric Research/University Corporation for Atmospheric Research (NCAR/UCAR), Boulder, CO. The period of performance for the follow-on contract is expected to begin October 1, 2014, upon the expiration of the current MOPITT SIPS contract (NNG04HZ08C).

   The work to be performed was originally competed under NASA Announcement of Opportunity (AO) OSSA-1-88. The instrument and the science team, proposed by NCAR/UCAR, were competitively selected as a result of this AO. On November 5, 2013, NASA's Senior Review approved the Terra mission, and by extension MOPITT SIPS, to continue performance through the end of Fiscal Year (FY) 2015, with consideration of possible mission continuity for FY 2016 and FY 2017, subject to the FY 2015, Senior Review findings and the operational status of this aging instrument. It is anticipated that the Terra mission will continue beyond FY2017 based on the scientific value of its data. Even if the mission concludes by FY2017, the data received from the MOPPIT instrument needs an additional two years to be reprocessed to ensure a consistent time-series of products at the end of the mission.

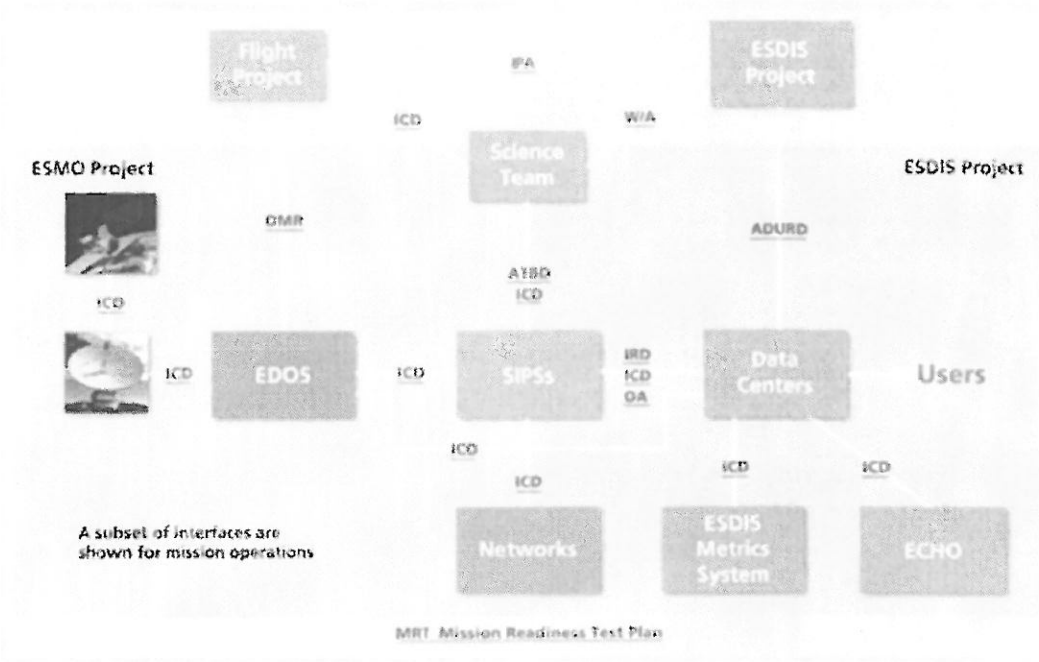
3. **Description of the supplies or services required, including an estimated value:**

   The purpose of this procurement is to ensure continued generation of standard data products from one of the instruments, MOPITT, currently operating on the Terra spacecraft launched in December 1999. Terra is one of several spacecraft that is part of NASA Earth Science Enterprise's Earth Observing System (EOS) Program.

   The data from the Terra instruments is being routinely processed, archived and distributed by NASA's EOS Data and Information System (EOSDIS). EOSDIS consists of several distributed components including twelve Distributed Active Archive Centers (DAACs)

and ten SIPSs. The MOPITT SIPS must produce standard products in accordance with the EOS Project Science Office approved Algorithm Theoretical Basis Documents for MOPITT, which are currently generated under the team leader support for MOPITT Experiment contract NNG04HZ26C also with NCAR, which in turn are archived and distributed to end users by the MOPITT instrument assigned DAAC. The products generated offer valuable utility to other civilian agencies, the intelligence community, and the private sector. This work includes development and maintenance of algorithmic software, quality assessment and validation of data products, and the respective documentation and preservation of product version histories. The following figure shows the interfaces among the flight project, science team, SIPSs and the EOSDIS Data Centers (a.k.a. DAACs).

EOSDIS Science Interfaces and Documentation (Sample)



The estimated cost type contract value for the MOPITT SIPS follow-on, inclusive of options, is . The period of performance and price breakdown is as follows:

Option	Period of Performance	Cost Type Contract
Base	October 1, 2014 – September 30, 2015	
1	October 1, 2015 – September 30, 2016	
2	October 1, 2016 – September 30, 2017	
3	October 1, 2017 – September 30, 2018	
4	October 1, 2018 – September 30, 2019	

4. **Statutory authority permitting other than full and open competition:**

The statutory authority permitting other than full and open competition is 10 U.S.C. 2304(c)(1), as implemented by FAR 6.302-1, only one responsible source and no other supplies or services will satisfy Agency requirements.

5. **A demonstration that the proposed contractor's unique qualifications or the nature of the acquisition requires use of the authority cited:**

The Terra spacecraft was launched in December 1999, with an original expected lifetime of six years. The data received from the instrument needs an additional two years beyond failure of the instrument or the end of the mission, whichever comes first, to be reprocessed to ensure a consistent time-series of products at the end of the mission. The MOPITT instrument is still operating eight years past its expected life. As the instrument ages, the likelihood of instrument failure becomes increasingly likely. The instrument has already lost half of its channels which would normally lead to a compromise in data quality. However, the NCAR/UCAR's MOPPIT science team devised a solution that allowed for vertical resolution that is as good as the pre-failure data. The NCAR/UCAR SIPS was able to respond quickly and appropriately to the solution and continues to generate quality products. If the science team at NCAR/UCAR had to interface with a different contractor other than the SIPS at NCAR/UCAR, there is an increased risk of failure in meeting the requirement due to lack of familiarity with the instrument's functions and peculiarities.

The unique knowledge and expertise of NCAR, under the direction of the principal investigator Dr. John Gille, has been accumulating since the mid-1990s, a few years before the launch of the MOPITT instrument on-board NASA's Terra spacecraft in December 1999. The unique knowledge and skills required to generate high quality standard science products reside with the instrument's principal investigators (PIs.) Even if a third party is used for generating the products, it is essential for the PIs to be involved in ensuring the product quality, in supplying the updates to the software, overseeing integration of that software in the third party environment, and monitoring the product generation. Assigning product generation software to a third party will involve additional developmental effort for a system that has already been working efficiently for several years, and would add delays, complexity, and expense to the Government. The specialized capabilities that the PI and his team provide for generation of higher-level science data products (Level 1 and above) for MOPITT are essential to perform the activities under this procurement since there are no other groups in the world that understand the nuances of the instrument, its history, calibration techniques, and the effects of changes of instrument characteristics on algorithms in order to maintain quality and consistency of standard data products. Throughout the remaining life of the instrument there will be a need for changes to algorithms, recertification of software, and reprocessing of data that have to be performed to maintain long-term consistency of the time-series.

The capability required to be maintained is for scientific and engineering work in the development, utilization, and calibration of essential algorithms to generate the MOPITT standard products and make them available to the user community. The application of these algorithms requires an expertise in tropospheric chemistry and instrument technology specific to the MOPITT instrument and, as such, is accomplished by PhD scientists and engineers at NCAR/UCAR. Specifically, NCAR/UCAR scientists and engineers have developed peer-reviewed algorithms for the standard product generation from MOPITT. The products they produce are geolocated calibrated radiances, carbon monoxide and methane column amounts, and carbon monoxide profiles.

Users of these products depend on the expertise provided by the NCAR/UCAR team to be assured that the data are valid and useful. The skill sets required to perform the algorithm development, utilization, product generation, and calibration functions include chemists and software engineers who are involved in tropospheric studies. NCAR/UCAR personnel is specialized in the fields of tropospheric chemistry and remote sensing. These skills are required in order to implement the various scientific theories used to develop, assess, and use the algorithms. These capabilities are essential to NASA in that they are necessary to fulfill NASA's needs in the area of tropospheric chemistry research. Without them, NASA and scientific researchers will be deprived of important scientific data. Without NCAR's unique skills, GSFC would be unable to meet requirements of the EOSDIS in the area of providing products to support tropospheric chemistry research. NASA would be unable to continue to generate and disseminate data products from the MOPPITT instruments to help the scientific research community study the changes in the chemistry of the troposphere and use such information in Earth system models.

Over the prior and current contract, NCAR/UCAR has demonstrated its capabilities to accomplish the work necessary to successful achievement of NASA's science programs and delivery of the algorithms, documentation, standard data products, and other information.

Duplicative costs, unnecessary complications, and increased risk of mission failure to the current structure of the ESDIS project would result in an effort to compete the requirement. Duplicative costs are demonstrated by the most likely two alternative scenarios. 1) Current hardware and software are transferred from NCAR/UCAR, or 2) completely redeveloped by a new contractor. It is estimated that for the first alternative, the Government will need to spend an additional over the 5-year period, with the assumption that the transfer of capability can be accomplished within three months. The second alternative will require a complete development of a new capability, and will be even more expensive. The added cost to the Government is estimated to exceed over the 5-year period. These alternatives equate to cost growth of original Government cost estimate of utilizing NCAR, as well as the increased likelihood of failure to meet the requirement due to any new contractor's learning curve.

Unnecessary complications and increased risk of mission failure will occur by performing the requirement at another organization separate from NCAR/UCAR, since additional

complexities due to added steps, knowledge transfers, or unnecessary redevelopment is needed to complete the same work. Throughout the life of the instrument, there will be a need for changes to algorithms, recertification of software, and reprocessing of data that have to be performed to maintain long-term consistency of the time-series. Performing the processing at another contractor separate from the PI's (NCAR/UCAR) will involve a complex interface between the PI's institution and the other organization to:

- Transfer of the PI's computational capabilities to another contractor or redevelopment of SIPS-like capabilities by another contractor
- Transfer of the PI's algorithmic software periodically to another contractor
- Integration and testing of algorithmic software at another contractor each time such a transfer occurs
- Routine transfer of products from another contractor to the PI for scientific quality assessment
- Assessment by the PI of the need for reprocessing at various times during the life of the mission and discussion of reprocessing strategy with another contractor
- Transfer of reprocessed data from another contractor to the PI for quality assessment

Selecting another contractor to perform the MOPPIT SIPS requirements will increase the risk of mission failure because it will add additional steps to the generation of MOPPIT's standard data products, by increasing technical risk during the mission knowledge transfer between NCAR/UCAR and another contractor, and by unnecessary redevelopment to complete the same work.

Based on the above rationale, procurement of this effort on a non-competitive basis is essential to efficiently maintain the capability for research in tropospheric chemistry and generation of MOPITT standard data products for the benefit of other scientific users.

6. **Description of the efforts made to ensure that offers are solicited from as many potential sources as practicable, including whether a notice was or will be publicized as required by Federal Acquisition Regulation (FAR) 5.2:**

In accordance with FAR subpart 5.2, a notice of NASA GSFC's intent to award this follow-on contract for a 5-year period will be synopsized in the Commerce Business Daily and NASA's Acquisition Internet Service.

7. **A determination by the contracting officer that the anticipated cost to the Government will be fair and reasonable:**

The proposed costs will be evaluated by the contracting officer's representative (COR), the contracting officer, and pricing support staff to determine that the labor rates, hours, skill mix, other direct costs, indirect costs, and fee are fair and reasonable. This may also include support from external organizations such as the Defense Contract Audit Agency, as needed.

8. **Description of the market research conducted, and the results, or a statement of the reasons market research was not conducted:**

   According to the COR's personal knowledge of the EOS program and its respective satellites and instruments, there are no known vendors with the capabilities as the current contractor. Therefore, a formal market survey was not conducted.

9. **Other facts supporting the use of other than full and open competition:**

   NCAR/UCAR has demonstrated its ability to successfully perform under current contract, NNG04HZ08C. The current contractor is the only one with the expertise to continue the requirement at the current level of performance. This expertise that has accumulated since the original AO contract award on April 10, 1990, and the current contract awarded May 28, 2004, is not easily replaced. By continuing performance with NCAR/UCAR the Government will achieve lower costs and maintain the current level of excellent performance.

10. **Sources, if any, that expressed an interest, in writing, in the acquisition:**

    There were no sources that expressed interest in writing by the close of the synopsis period of April 24, 2014.

11. **The actions the Agency may take to remove or overcome any barriers to competition before any subsequent acquisition for the supplies or services required:**

    No actions are anticipated by the Agency to remove or overcome the barriers to competition for any subsequent acquisitions of similar services because it is unlikely that subsequent acquisitions will occur. At this time the need for continued operation of the MOPITT instrument beyond the 5-year period of this JOFOC has not been determined by the NASA HQ SMD. This will depend on recommendations from future Earth Science Senior Reviews.

JOFOC Signature Page for extension of work being performed on *The Measurement of Pollution in the Troposphere (MOPITT) Science Investigator-led Processing System (SIPS) Follow-On* under contract NNG14HZ19C

TECHNICAL DIRECTORATE: I certify that the facts presented in this justification are accurate and complete.

Signature Date

CONTRACTING OFFICER: I certify that this justification is accurate and complete to the best of my knowledge and belief.

Signature Date

PROCUREMENT OFFICER:
(CONCURRENCE)

Signature Date

GSFC COMPETITION
ADVOCATE:
(APPROVAL)

Signature Date