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Draft Version

ANNOUNCEMENT OF OPPORTUNITY

MARS SURVEYOR PROGRAM
2001 ORBITER, LANDER, ROVER MISSIONS: SCIENCE INVESTIGATIONS AND CHARACTERIZATION OF ENVIRONMENTS

Notices of Intent Due: July 11, 1997
Proposals Due: August 18, 1997

OMB Approval No. 2700-0085

MARS SURVEYOR PROGRAM

2001 ORBITER, LANDER, AND ROVER MISSIONS:

SCIENCE INVESTIGATIONS AND

CHARACTERIZATION OF ENVIRONMENTS

Announcement of Opportunity
Soliciting Proposals for Basic Research
for Period Ending
August 18, 1997

AO 97-OSS-XX
Issued: June 19, 1997

Office of Space Science
Office of Space Flight
Office of Life and Microgravity Sciences and Applications
National Aeronautics and Space Administration
Washington, DC 20546-0001

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Mars Surveyor Program 2001
Orbiter, Lander, and Rover Missions:
Science Investigations and
Characterization of Environments

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1.0 DESCRIPTION OF THE OPPORTUNITY

1.1 Introduction

General scientific objectives for the exploration of the solar system have been established by the appropriate National Aeronautics and Space Administration (NASA) scientific advisory committees, including the Committee on Planetary and Lunar Exploration (COMPLEX) of the Space Studies Board of the National Research Council, and the Solar System Exploration Subcommittee of the NASA Space Science Advisory Council (SScAC). In response to these recommendations, NASA has initiated a long-term systematic program of Mars exploration, the Mars Surveyor Program (MSP). The overarching goal of the program is to answer the question *"did life ever exist on Mars?"* The scientific objectives established by the program to address this goal are to search for evidence of past or present life, to understand the climate and volatile history of Mars, and to assess the nature and inventory of resources on Mars, with the common thread of these objectives being the role of water. NASA has also determined that the Mars Surveyor Program will play a critical role in acquiring the knowledge through the conduct of science investigations and the demonstration of critical technologies necessary to make a decision early in the next century to initiate the exploration of Mars by humans.

The MSP is a sustained series of missions to Mars, each of which will provide important, focused scientific return. Within a level funding cap, two launches will take place approximately every 26 months in every launch window opportunity from now until 2005. It is expected that during the 2005 opportunity a mission will be launched whose goal will be to return samples of martian surface and atmosphere to Earth. It is intended that these samples will have been collected by one of the landed missions launched in the 2001 and 2003 opportunities. In the 2001 launch opportunity, proposals for which are solicited by this Announcement of Opportunity (AO), the MSP intends to launch on separate Delta-class launch vehicles an Orbiter and a Lander that will carry a Rover to the surface.

The theme for the 2001 Orbiter, Lander, and Rover Missions is the exploration of the ancient highlands of Mars, in order to characterize the surface environment in terms of its geologic and aqueous history. The theme is derived from the Report prepared by the Mars Expeditions Strategy Group chartered by NASA's Office of Space Science, entitled "*The Search for Evidence of Life on Mars."* A MSP 2001 Science Definition Team (SDT) was also chartered by the Office of Space Science to recommend scientific objectives for the 2001 Orbiter and Rover Missions.

In addition to providing opportunities for scientific investigations of Mars, the 2001 Mars Surveyor Missions represent key opportunities to collect data and demonstrate technologies critical to initiating the exploration of Mars by humans. To this end, a Human Exploration Payload Definition Team (HEPDT) was jointly chartered by the NASA Office of Space Flight, Office of Life and Microgravity Science and Applications, and Office of Space Science. As determined by the HEPDT, the goals of the 2001 Orbiter and Lander Missions in addressing those needs are to characterize the radiation environment, to characterize martian dust and soil, to demonstrate the technologies of aerocapture and precision landing, and to demonstrate components needed for in-situ propellant production. The Reports of the SDT and HEPDT formed the bases for the science and measurement objectives given in this AO (for information on accessing these Documents, see Section 1.4).

1.2 Announcement Objectives

NASA announces an opportunity to propose science investigations to be carried into Mars orbit by the MSP 2001 Orbiter. The investigations will require instrumentation that can provide high spatial and spectral resolution mineralogical/morphological data. The three-axis stabilized Orbiter will use aerocapture to achieve a near-polar orbit around Mars at 400 km altitude, with descending node crossing near 4:15 P.M. Mean Solar Time. The instrumentation will be nadir-pointed throughout the near-circular mapping orbits, which are planned to continue for about three Earth years.

NASA also announces an opportunity to propose science investigations to be carried out with data returned by an integrated suite of instruments for the MSP 2001 Rover to be carried to the martian surface by a Lander. The Lander will use an active descent propulsion system, similar to the Mars Surveyor 1998 Lander, to land on the surface of Mars. It is expected that the Rover will have a Mars surface lifetime of one Earth year, a range of ten or more kilometers, and will provide a platform for *in situ* scientific analyses, and the collection and storing of samples of surface materials for possible return to Earth in a future opportunity..

NASA also announces opportunities to propose instrumentation to characterize and measure the near-space radiation environment in the Mars orbital mission phase, and instrumentation to characterize and measure the radiation, and the dust and soil environments, at the surface of Mars. Instrumentation for these surface investigations will be flown on the Mars Surveyor 2001 Lander. The Lander will also serve as a platform for demonstration of several key components of an *in situ* propellant production facility.

1.3 Availability of AO Documentation

This AO is available electronically via Internet host <http://www.hq.nasa.gov/office/oss/> by opening “Research Opportunities” from the menu. Paper copies may be obtained from the NASA address given in Section 1.5.

A Proposal Information Package (PIP) provides detailed background information on the Mars Surveyor Program 2001 Orbiter, Lander, and Rover Missions that will be needed for the preparation of a formal proposal. The PIP contains the Technical Descriptions and Instrument Interface Definitions for the MSP 2001 Orbiter, Lander, and Rover Missions and is available using anonymous file-transfer-protocol (ftp) via Internet host <ftp://mgsw3.jpl.nasa.gov/pub/mars01-ao>. Paper copies of the PIP and further information on access procedures may be obtained from:

Ms. Lynn Lowry
Mail Stop 180-401
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109-8099
USA
Facsimile: 818/393-6800
e-mail: lynn.e.lowry@jpl.nasa.gov

Clarification of items in the PIP will be provided in response to inquiries received and will be available electronically on the ftp site given above.

1.4 Availability of Reports Referenced In This AO

The following reports are referenced in this AO and are available electronically via Internet host <http://www.hq.nasa.gov/office/oss> by opening “Research Opportunities” from the menu. Paper copies of the reports may be obtained from the NASA address given in Section 1.5.

* Report of the Mars Expeditions Strategy Group

* Report of the MSP 2001 Science Definition Team

* Report of the Human Exploration Payload Definition Team

* NASA Draft Document NPG 8020.12B, entitled "*Planetary Protection Provisions for Robotic Extraterrestrial Missions*"

1.5 Schedule for Proposal Submission and Selection

A written Notice of Intent signifying the writer's intent to submit a proposal in response to this AO must be submitted by all proposers and is due at the address given below on or before July 11, 1997. The Notice of Intent should briefly describe the objectives, and include a brief description of the proposed investigation. Proposers should include their name, address, telephone number, and the names and addresses of all Co-Investigators known by that deadline date as well as their sponsoring organizations.

Proposals must be received at the address given below (original plus 20 copies) on or before close of business August 18, 1997, in order to be considered for this opportunity.

Jorge Scientific Corporation
Mars Surveyor Program
Suite 700
400 Virginia Avenue, SW
Washington, DC 20024
USA

Point of contact for commercial delivery: Ms. Debra Tripp (telephone 202/554-2775)

A review committee appointed by NASA will review all instrument and instrument suite proposals submitted in response to this AO for possible flight on the MSP 2001 Orbiter, Lander, and Rover Missions. The selection of investigations for the MSP 2001 Orbiter, Lander, and Rover Missions is planned to take place within three months after the proposal deadline.

Additional information may be obtained from:

Dr. Patricia G. Rogers
MSP 2001 Program Scientist
Code SR
NASA Headquarters
Washington, DC 20046-0001
USA

Telephone:	202/358-0294
Facsimile:	202/358-3097
e-mail:	progers@hq.nasa.gov

2.0 MSP 2001 MISSIONS

2.1 Orbiter Mission Overview and Objectives

The MSP 2001 Orbiter attached to its Cruise Stage will be launched on a Delta-class launch vehicle in March 2001. It is expected to arrive at Mars in December 2001 where the Cruise Stage will be jettisoned several minutes before the Orbiter is captured into Mars orbit. The Orbiter will be aerocaptured into Mars orbit, which will require accurate navigation of its Mars approach orbit and the angle of entry into the upper martian atmosphere, as well as active attitude control during the period of atmospheric braking. The aerocapture technique provides a fuel efficient means for effecting orbital capture and substantially reduces the total propellant mass required to achieve low circular orbit. The aeroshell surrounding the Orbiter will be instrumented for aerothermal measurements to be made during its passage through the atmosphere. After being aerocaptured into an elliptical orbit, the spacecraft will perform maneuvers to raise its periapsis altitude and circularize its orbit at approximately 400 km altitude. The mapping orbit configuration will be a nearly polar orbit with descending node crossing near 4:15 P.M. Mean Solar Time. Mapping orbits, with a period of approximately 118 minutes, will continue for three Earth years. The Orbiter will be capable of relaying data from the 2001 Lander and Rover Missions to antennas of the NASA Deep Space Network. Approximately 500 days after entering Mars orbit, a maneuver will be performed to slightly change the orbital inclination to initiate a slow orbital precession that is stopped when the orbit has precessed to a nearly 6:00 P.M. orientation.

The MSP 2001 Orbiter will be designed to accommodate the remaining Mars Observer science investigation, namely the Gamma Ray Spectrometer (GRS), a mineralogical/morphological investigation, a radiation investigation, and a UHF relay system for communication with the Lander and with the Rover. Once in its mapping orbit, the Orbiter will provide the platform for the GRS and for science instruments solicited through this AO.

The principal objectives of the Orbiter Mission and its scientific payload are to:

* Demonstrate the capability to perform the aerocapture function;

* Achieve global mapping of the elemental composition of the surface, and the abundance of hydrogen in the shallow subsurface, using measurements from the GRS and its neutron spectrometer, respectively;

and, by virtue of investigations selected through this AO,

* Acquire high spatial and spectral resolution mapping of surface mineralogy;

* Acquire high spatial resolution data on surface morphology; and

* Characterize specific aspects of the martian near-space radiation environment.

It is expected that the Orbiter will achieve its mission objectives within three Earth years after reaching Mars orbit. The Orbiter is expected to continue to serve as a communications relay for landed vehicles for an additional two Earth years.

2.2 Lander and Rover Missions Overview and Objectives

The Lander and Rover, attached to a Cruise Stage, will be launched on a Delta-class launch vehicle in April 2001 and are expected to arrive at Mars in January 2002, which will be the martian southern spring/northern summer season. The Lander descent to the surface will be slowed initially by an aeroshell and then by parachute. Final descent will be controlled by an active terminal descent system that uses monopropellant hydrazine similar to the Mars Surveyor 1998 Lander. The landing accuracy goal will be approximately 10 km, three-sigma.

The primary engineering considerations for selection of the landing site for the Lander and Rover are site elevation (which determines the trajectory path length and atmospheric mass for aerobraking through the lower atmosphere), and solar illumination (which determines power availability and thermal control needs) and thus determines the possible range of landing site latitudes. Based on these considerations, the landing site will tentatively be limited to sites less than 2.5 km above the mean martian datum, and between the latitudes 15 degrees South and 30 degrees North.

The specific landing site will be tentatively selected prior to launch based upon the requirements of the selected Rover science investigations and within the engineering constraints outlined above. In addition, it is expected that prior to the launch of the Mars 2001 Lander and Rover, present knowledge of Mars will have been improved considerably by analyses of scientific data to be returned by the Mars Pathfinder, Mars Global Surveyor, and Mars 1998 Missions. More accurate surface elevation profiles will be derived from altimetry expected to be provided by the laser altimetry investigation carried aboard the Mars Global Surveyor Mission. Thus the final selection of the landing site for the 2001 Lander and Rover Missions will also be based on the most current knowledge of Mars that exists prior to the launch of the 2001 Lander and Rover Missions.

It is expected that the duration of the Lander Mission will be approximately 100 days in order to adequately monitor the radiation environment, and to demonstrate and characterize the performance of those components of an *in situ* propellant production facility that interact with the martian environment, for example, dust filters, seals, and compressors.

Deployment of the Rover and subsequent initiation of its science activities commence within one day of landing. It is expected that the duration of the Rover Mission will be approximately one Earth year. Communications with the Rover will be accomplished through a relay link to the 2001 Orbiter. The Rover will operate autonomously between communication links; since the Rover is solar-powered, its operations will occur only during martian daylight hours.

2.2.1 Lander Mission Objectives

The 2001 Lander Mission will provide high resolution imaging of the landing site and the immediate vicinity during its descent to the martian surface. In addition the Lander Mission will provide a platform for surface radiation measurements and will also serve as a platform for demonstration of several key components of an *in situ* propellant production facility. The Lander will communicate with Earth via the 2001 Orbiter and is expected to survive on the martian surface for approximately 100 days.

The principal objectives of the Lander Mission and its payload are to:

* Deliver the Rover and its scientific payload safely to the martian surface;

* Provide high spatial resolution descent imaging of the selected landing site and its immediate vicinity for use in site analyses and in initial operations of the Rover and planning of initial Rover traverses;

* Demonstrate the capability to perform precision landing, with the goal of achieving an accuracy of approximately 10 km, 3-sigma;

and, by virtue of investigations selected through this AO,

* Characterize the martian surface radiation environment as related to radiation-induced risk to human explorers; and

* Characterize martian dust and soil to identify undesirable and harmful interactions with human explorers and associated hardware systems, and to support the design of extravehicular activities (EVA) and habitation systems.

2.2.2 Rover Mission Objectives

The 2001 Rover Mission will provide surface traverse capability of ten or more kilometers over a time period of approximately one Earth year and will communicate with Earth via the 2001 Orbiter.

The principal objectives of the Rover Mission and its scientific payload, as provided by investigations selected through this AO, are to:

* Characterize *in situ* sites in the ancient highlands where the environmental conditions may have been favorable to the preservation of evidence of possible prebiotic or biotic processes including the emergence (and, potentially, the persistence) of life;

* Analyze and document surface materials, for example, rocks, soil, duricrust; and

* Acquire and store diverse samples for subsequent return to Earth.

The Mars Surveyor 2001 Project will provide the basic elements of a mobile platform from which these objectives can be met, and will work with the selected science team to create a Rover Mission that is optimized to accomplish the goals of their investigations.

3.0 MSP 2001 SCIENCE AND MEASUREMENT OBJECTIVES

3.1 Orbiter Science and Measurement Objectives

Knowledge of elemental composition of the martian surface is fundamental to understanding the origin and geochemical evolution of the planet. In addition to understanding the elemental composition, it is also necessary to understand the manner in which those elements form minerals and the petrology of the rocks that occur on the martian surface. Therefore, mapping the mineralogy of the surface from orbit is a critical objective of the 2001 Orbiter Mission. Understanding the mineralogy and petrology of the martian surface is key to understanding the geologic evolution of the planet and to the search for appropriate environments for landed missions particularly with respect to sites that might hold evidence of prebiotic or biotic activity. To this end, the Orbiter payload will include the GRS and instrumentation that is expected to be selected through this AO capable of high spatial resolution mineralogical and morphological surface mapping.

The science measurement objectives of the GRS are to:

* Globally map the elemental composition of the martian surface with an accuracy of 10 percent or better and a spatial resolution of approximately 300 km; and

* Determine the abundance of hydrogen in the shallow subsurface.

The mineralogical/morphological surface mapping investigation solicited through this AO is nominally expected to:

* Determine the mineralogical composition of the martian surface for minerals whose abundance is approximately 10% or greater and at spatial scales of approximately 100 m; and

* Provide information on the morphology of the martian surface such that features significantly less than 100 m can be adequately resolved.

Spectral data for mineralogy will be acquired at a late afternoon illumination (nodal crossing at approximately 4:15 P.M.), and data rates will be constrained as described in the Proposal Information Package. It is anticipated that in addressing the above objectives, proposers would consider trade-offs between spatial resolution, areal coverage, and detection levels.

In addition, if proposed and selected as a supporting instrument to a radiation environment investigation on the martian surface, Orbiter instrumentation will characterize specific aspects of the Mars near-space radiation environment. The primary goal of these investigations would be to monitor and measure components of solar particle events that are significant to human health and safety, specifically the incident spectra of protons and helium from 30 MeV per nucleon to approximately 500 MeV per nucleon, so that their contribution to the total dose on the surface of Mars can be determined. It is intended that the space measurements will complement and aid in the interpretation of measurements made on the martian surface.

3.2 Lander Science and Measurement Objectives

As part of the planning for human exploration of Mars, the radiation environment must be understood such that appropriate countermeasures can be developed. Understanding the radiation environment on the surface and how the atmosphere interacts with the externally imposed radiation field is critical if humans are to spend significant time on the martian surface. Specific questions about the effective shielding by the martian atmosphere and the formation of secondary radiation within the atmosphere must be addressed.

The physical and chemical properties of the soil and dust that occur on the martian surface need to be understood such that the interaction of that material with both mechanical and human systems can be assessed. Understanding the effects of the soil and dust on mechanical systems is a critical issue in the development of long-lived robotic systems for Mars exploration. Understanding the effects on humans is important in order that appropriate systems can be developed to shield humans from any potential health risks.

The ability to manufacture propellant on the martian surface provides a significant benefit in cost and mass reduction for missions that intend to leave the surface (e.g., sample return and human return to Earth). Prior to conducting a mission that relies on the *in situ* production of propellant, it is important to demonstrate that the key technologies can operate effectively on the martian surface for the appropriate periods of time. The 2001 Lander Mission will provide the platform to conduct these demonstrations.

The principal objectives of the Lander investigations are to characterize the radiation environment at the martian surface, and the physical properties of the dust and soil. In addition, the Lander will provide a platform for the demonstration of particular components of an *in situ* propellant production facility to be provided by NASA.

The objectives of the radiation environment investigation solicited through this AO are to:

* Measure the accumulated tissue-equivalent absorbed dose and dose rate as a function of time with a resolution on the order of minutes;
* Measure the radiation quality of the radiation environment; and
* Distinguish the individual contributions of protons, neutrons, and energetic galactic cosmic radiation nuclei.

The energy deposition spectrum of interest is from approximately 0.1 KeV per nucleon to several thousand KeV per nucleon, and includes charged particles, incident protons with energies greater than 30 MeV, and other ions up to iron having energies up to several GeV per nucleon as well as all the secondary radiation they produce, including neutrons. Surface measurements will be correlated with measurements of the Mars near-space environment, either through instrumentation making simultaneous measurements on the 2001 Orbiter, or through the use of data from other, existing space missions.

Dust and soil investigations selected through this AO are expected to characterize dust suspended in the atmosphere, and surface soil and dust to a depth of 10 cm. The measurement objectives are to:

* Determine the particle size and distribution, in the range 0.01 to 10.0 microns, with higher emphasis on particles much smaller than 1.0 micron;
* Determine the total columnar suspended load of dust in the atmosphere;
* Determine the particle physical shape (e.g., crystalline/amorphous, fibrous/non-fibrous, smooth/jagged) and distribution;
* Determine the electrostatic properties such as adhesion potential, strength of adhesion, and character of the charge;
* Determine the chemical reactivities with a sensitivity of part per million (of particular interest are changes in the reactivities upon heating, with exposure to humidity, and with emphasis on the identification and volatility of the gases evolved);
* Determine the toxic trace elements including, but not limited to As, Be, Cd, Cl, F, and Pb; and
* Determine the toxic and genotoxic potential of dust and soil to biological cell analogs, with the objective of identifying reactivity towards quasi-cellular systems from which the potential for acute toxicity for human explorers could be inferred.

3.3 Rover Science and Measurement Objectives

The functions of the 2001 Rover Mission will include the exploration and characterization of sites in the ancient highlands and the collection and storage of samples for return to Earth by missions launched in the 2005 or later opportunities.

It is expected that the Rover will be capable of traverses of ten or more kilometers over a time period of one Earth year. A descent imaging camera on the Lander will be furnished by NASA to provide images of the landing site for use in site analyses and in initial Rover operations and planning of initial traverses The science payload will be capable of conducting *in situ* scientific analyses of surface materials, and will also be capable of acquiring and storing samples of surface materials.

The science and measurement objectives of the 2001 Rover Mission investigations include:

- Color stereo imaging of martian surface environments;
- Remotely-sensed point discrimination of mineralogical composition (e.g., using infrared reflectance or emission spectroscopy);
- Determination of the fine scale (20 microns) textural properties of martian surface materials; and
- Determination of the elemental and mineralogical composition of martian surface materials.

4.0 TYPES OF PROPOSALS

This AO invites Principal Investigator/Instrument Proposals for the MSP 2001 Orbiter, Lander, and Rover Missions. Proposals for Interdisciplinary Scientist Investigations or for Participating Scientist Investigations are not solicited by this AO. Following the selection of investigations solicited through this AO, NASA expects to solicit proposals for Interdisciplinary Scientist Investigations and for Participating Scientist Investigations through one or more future announcements (described in Section 4.2). All proposals submitted in response to this AO are to be prepared and submitted in accordance with the policies and provisions of Appendices A, B, and C of this AO.

4.1 Principal Investigator/Instrument Proposals

Proposers must explicitly state which of the 2001 Missions described in this AO (i.e., Orbiter Mission, Lander Mission, or Rover Mission) are addressed by their proposals.

4.1.1 Orbiter Investigations

Proposals for the GRS are not solicited by this AO.

NASA intends to provide instrumentation for measurement of properties of the martian atmosphere during the aerocapture phase; such instrumentation is not solicited by this AO.

This AO solicits Principal Investigator/Instrument proposals for participation in the 2001 Orbiter Mission for the following types of investigations:

- High spatial and spectral resolution mineralogical/morphological mapping; and
- Near-space martian radiation environment characterization.

The Proposal Information Package (PIP) provides a detailed description of the basic Orbiter vehicle that will provide the platform for these investigations.

Investigations that are proposed to characterize the Mars near-space environment must also address the martian surface radiation environment objectives specified in Section 3.2; that is, <u>stand-alone proposals that address only the space radiation environment are not solicited.</u> Proposals must address both the Mars near-space and martian surface radiation environment, and all measurement objectives specified in Sections 3.1 <u>and</u> 3.2. Proposals for the near-space radiation environment may use new instruments proposed for the 2001 Orbiter or use data from other existing space missions. Proposers of radiation instrumentation for the Orbiter must specify the approach taken to correlate martian surface measurements to near-space measurements and must specify instrument system accuracy, precision, sensitivity, and resolution over the range of intended energy deposition. Proposals must also specify the approach taken for using data obtained from the investigation to validate or update existing models of the radiation environment, to determine potential impacts on radiation forecasting and warning strategies, and to determine their correlation with other relevant space radiation measurements.

4.1.2 Lander Investigations

The MSP 2001 Project intends to provide the descent imaging camera required for acquisition of surface images during the descent phase of the Lander Mission. Therefore, <u>proposals for the Lander descent imaging camera are not solicited by this AO.</u>

NASA intends to provide the facilities required for demonstration of particular components of *in situ* propellant production. <u>Proposals for these or other components of *in situ* propellant production are not solicited by this AO</u>.

This AO solicits Principal Investigator/Instrument proposals for participation in the 2001 Lander Mission for the following types of investigations:

* Characterization of the radiation environment at the martian surface; and
* Characterization of martian dust and soil, including physical properties, oxidation properties, and chemical and mineralogical properties.

Proposals for the radiation characterization investigations should address all measurement objectives specified in Sections 3.1 <u>and</u> 3.2, including measurements on the martian surface, as well as in the Mars near space environment. Proposers may specify the use of data from existing space missions for obtaining the space environment data, or may propose an instrument for inclusion on the 2001 Orbiter Mission; see Section 4.1.1.

Proposers of investigations that require radiation instrumentation for the Lander must specify instrument system accuracy, precision, sensitivity, and resolution over the range of intended energy deposition. Proposals must specify the approach taken to correlate surface measurements to near-space measurements. Proposals must also specify the approach taken for using data obtained from the investigation to validate or update existing models of the radiation environment, to determine potential impacts on radiation forecasting and warning strategies, and for its synergy with other relevant space radiation measurements.

Proposals for the dust and soil characterization investigations may include individual instruments that address one or more of the measurement objectives given in Section 3.2, or an integrated suite of instruments that addresses <u>some or all</u> of the measurement objectives given in Section 3.2.

For the Lander payloads, any deployment devices, sampling mechanisms, or other devices necessary for the proposed instruments to accomplish their measurements must be identified as part of the proposed payload instrument. Because such devices significantly affect the basic design and function of the Lander, the MSP 2001 Project expects to provide guidance in their development and integration. If a manipulation system on the Lander is to be used as the means of acquiring samples for a Lander investigation, a detailed description of the manipulator-instrument interaction must be provided.

The Proposal Information Package (PIP) provides a detailed description of the basic Lander vehicle that will provide the platform for these investigations.

4.1.3 Rover Investigations

This AO also solicits Principal Investigator proposals for an integrated scientific investigation that meets all of the 2001 Rover science and measurement objectives given in Section 3.3, using an integrated suite of instruments for the Rover. Proposers of integrated suites of scientific instruments must prioritize individual instruments, and the individual Co-Investigator responsible for an instrument or a portion of a proposed integrated instrument suite must be identified in the proposal.

The basic elements of a mobile platform that provide mobility, power, computation, and communications will be supplied by the 2001 Mars Surveyor Project. Proposers must clearly define instrument deployment devices, sampling mechanisms, drills, sample containers, or other devices necessary for the instruments to accomplish their tasks for the Rover science payload. Because such devices significantly affect the basic design and function of the Rover, the MSP 2001 Project expects to provide guidance in their development and integration. In the case of the sample container, which must be transferable to a sample return vehicle at a later date, the Project expects to assume responsibility for its development and, if necessary, to provide guidance to the selected PI in the modification of sample acquisition devices that interface with the sample container. The Project and the selected PI will work in close coordination to assure the optimization of the Rover design to achieve the science objectives described in Section 3.3. Within the limited resources available, this approach is expected to maximize the scientific return from the Rover Mission.

The Proposal Information Package (PIP) provides a description of the basic vehicle that will provide the mobile platform for the scientific instruments.

4.2 Future Solicitations

Following the selection of investigations solicited by this AO, NASA expects to solicit Interdisciplinary Scientist proposals by individuals for investigations of an interdisciplinary nature that require the use of scientific measurements acquired during the Orbiter, Lander, and Rover Missions. In response to that solicitation, it is expected that proposers will define a specific scientific investigation and also indicate how they would participate in the following 2001 Mission activities: 1) the landing site selection process; 2) the sample characterization and selection process; and 3) the planning and surface science operation of the Lander and Rover Missions. NASA also expects through that future AO to solicit Interdisciplinary Scientist proposals to use data acquired by the 2001 Missions to assess the readiness required for a decision by NASA to initiate the exploration of Mars by humans, and identify the scientific knowledge that is expected from the selected MSP 2001 Investigations needed for planning the 2003 Rover Mission and the 2005 Sample Return Mission. NASA may also solicit proposals through that future AO for Participating Scientist investigations that are either interdisciplinary or instrument-specific, to be carried out by scientists who wish to participate only in the data collection and analysis phases of the 2001 Orbiter, Lander, or Rover Missions.

5.0 FORMATION OF PROJECT SCIENCE GROUP

After selection of investigations by NASA, a MSP 2001 Project Science Group (PSG) will be established. All 2001 Orbiter, Lander, and Rover Principal Investigators selected through this AO as well as any subsequent Interdisciplinary and/or Participating Scientists (see Section 4.2) will automatically become members of the PSG. The PSG will be co-chaired by the MSP 2001 Project Scientist at the Jet Propulsion Laboratory and the NASA Headquarters Program Scientist.

The PSG will meet regularly through the lifetime of the MSP 2001 Orbiter, Lander, and Rover Missions, and will work with the Mars Surveyor 2001 Project Office. Responsibilities of the Mars Surveyor 2001 PSG are further described in the PIP.

6.0 CONSTRAINTS AND REQUIREMENTS

Certain constraints are mandated by NASA's commitment to cost efficiency in the MSP 2001 Missions. The cost constrained nature of the missions creates special conditions: the scientific payload will be limited by available resources of funding, mass, total energy consumption, volume, data rate, duty cycle, and other key resources as specified in the PIP.

The PIP contains detailed descriptions of the 2001 Orbiter, Lander, and Rover Missions and spacecraft, and also contains information on the environments in which the instruments are expected to survive and operate, Principal Investigator (PI) responsibilities and deliverables, and a description of the capabilities of the MSP ground system and mission operations. In case of a conflict between this AO and the PIP, the AO takes precedence.

Costs of meeting planetary protection for the Orbiter, Lander, and Rover payloads, with requirements given in the PIP, must be included by proposers in the instrument payload costs. Briefly, planetary protection requirements depend on the specific mission. The Orbiter payload can meet requirements with a long orbital lifetime; the Lander payload will be required to achieve and maintain a reduced level of microbial contamination; and the Rover payload will be required to meet a prescribed level of sterilizatin for all outside surfaces. Information on planetary protection and its requirements are available from NASA Document NPG 8020.12B (for information on accessing this Document, see Section 1.4).

6.1 Constraints on Cost and Mass

For all instrumentation proposed in response to this AO, innovative design approaches that incorporate technological advances in light weight, high performance instruments are solicited.

The total mass available to support the Orbiter mineralogical/morphological mapping investigation is 12 kg. The total allowable cost of Phases B through D (to Launch plus 30 days) for the Orbiter mapping investigation solicited by this AO is not to exceed $9.5 M (in real year dollars).

For the entire set of Rover investigations, the total mass available, including the mass of instruments, and devices for instrument deployment, sample collection and sample containerization is 15 kg, and the total allowable cost of Phases B through D (to Launch plus 30 days) is not to exceed $17.0 M (in real year dollars).

The maximum funding available by Fiscal Year for the Orbiter mineralogical/morphological investigation and the Rover science investigations is summarized in the Table below. Funding will be through Phases B-D of the Mars Surveyor 2001 Project, which includes Fiscal Years 1998-2001.

	FY 1998	FY 1999	FY 2000	FY 2001	TOTAL
Orbiter Mapping Investigations	$2.5 M	$4.5 M	$1.5 M	$1.0 M	$9.5 M
Rover Investigations	$3.0 M	$5.5 M	$5.0 M	$3.5 M	$17.0 M
TOTAL	$5.5 M	$10.0 M	$6.5 M	$4.5 M	$26.5 M

The total mass available for a radiation monitoring device on the Orbiter is 4 kg. The total mass available for the radiation monitoring device on the Lander is 4 kg. The total allowable cost of Phases B through D (to Launch plus 30 days) for both the Orbiter radiation investigation and the Lander radiation investigation is not to exceed $2.0 M; proposers should submit budgets for Fiscal Years 1998-2001 whose total for all years does not exceed $2.0 M.

The total mass available for dust and soil characterization instrumentation on the Lander is 8.5 kg, and the total allowable cost of Phases B through D (to Launch plus 30 days) is not to exceed $5.0 M; proposers should submit budgets for Fiscal Years 1998-2001 whose total for all years does not exceed $5.0 M.

6.2 Mars Surveyor Operations Project

The Mars Surveyor Operations Project (MSOP) was established within the Mars Exploration Directorate (MED) at the Jet Propulsion Laboratory to provide cost-effective mission operations (Phase E) support to all Mars missions managed by the MED. Annual budgets are established for the MSOP and must provide for the operation of all Mars Surveyor Missions beyond Launch plus 30 days, for the generation and archiving of science investigator Data Products, and for initial data analysis activities.

According to the multi-mission operations management strategy established by the MED, the management of Mars Surveyor Missions that have concluded their development phase (Phase D, at Launch plus 30 days), is transferred to the MSOP. The first such transfer, of the management of Mars Global Surveyor, was effected in January 1997; it is expected that the management of the Mars Surveyor 1998 and Mars Surveyor 2001 Projects will be transferred to the MSOP in approximately March 1999 and May 2001, respectively.

A MSOP budget profile that addresses Phase E (mission operations phase, after Launch plus 30 days) of the MSP 2001 Missions has not yet been established. Proposers are requested to submit their budgets for Phase E and describe their expected activities in the following areas: 1) science operations; 2) generation, validation, and archiving of Data Products; and 3) data analysis activities leading to publication of the initial results of their investigations. Budgets should be submitted for Phase E of the MSP 2001 Missions, for the period May 1, 2001, through December 31, 2003. Selection of an investigation does not imply a commitment for Phase E funding at the budget level submitted by the selected investigator. Phase E budgets will be negotiated by the MSOP with Principal Investigators selected for the MSP 2001 Missions.

6.3 Science Operations Site Requirements

It is expected that Orbiter, Lander, and Rover PI's will develop and maintain a science operations facility that will provide instrument performance assessment and data records assimilation and archiving. In addition, Orbiter and Lander PI's will provide instrument command generation and transmission to the Project Database. Instrument command generation and transmission for the Rover will be performed by the MSOP.

To enable these activities, the MSOP will provide to each PI a workstation complete with operations compatible software, connectivity, and maintenance. In addition, Internet connections to each Co-I for data records transfer will be supplied. Implementation of science operations facilities in time to support spacecraft/instrument testing will be monitored by the MSOP Science Office by means of reviews, documentation, and configuration control.

6.4 Data Records Requirements and Data Validation

The MSP 2001 Project requires that raw data, calibration records, and processed data be maintained in an updated form throughout the period of investigation. Specifically, each selected PI must plan to:

* Maintain a continually updated record of the "best version" of the data until meaningful changes in data calibration no longer occur;

* Make updated data records available to other investigators and project personnel during the mission for shared analysis; and

* Support the timely processing and distribution of data.

In addition, PI's selected for investigations sponsored by the Office of Space Science must plan to archive their Data Products in the Planetary Data System (PDS) in a format that meets PDS requirements.

Investigators sponsored by the Office of Space Science no longer have exclusive use of their data for any proprietary period. Therefore, selected PI's are expected to release data for public access as soon as is feasible. After a short period for verification and validation, not to exceed six months, the PI must deposit the validated data in the PDS. Data Products will be archived in the PDS as soon as they are available, on a time scale commensurate with the level of data processing identified in the Science Data Management Plan. Image data will be made available publicly shortly after reception on the ground

Initial data analyses will be accomplished by the PI's and their Co-I's. Proposers are expected to include, as part of their proposed Mission Operations and Data Analysis activities, an appropriate data analysis period that is consistent with PDS archiving activities.

In summary, the investigation team will be responsible for initial analysis of the data, its subsequent delivery to the PDS, and the publication of initial scientific findings. The investigation team is expected to define a set of archival Data Products, negotiate a PDS-compatible data format and provide timely delivery of the Data Products according to the Science Data Management Plan.

Investigators selected for investigations sponsored by the HEDS Enterprise must provide NASA with two Reports:

1. A "quick-look" Report of preliminary results, due 30 days after data is provided by NASA to the PI.

2. A final Report containing all information on the investigation, due approximately one year after all original required data has been provided by NASA to the PI.

PI's selected for investigations sponsored by the HEDS Enterprise must also provide NASA with all investigation data for placement in the appropriate Data Archival. Data in this archive will be made available to the scientific community.

6.5 Approaches to Reducing Instrument and Instrument Operations Costs

Because of the firm overall limitation on the science costs and the total costs to NASA of the MSP 2001 Orbiter, Lander, and Rover Missions, prospective investigators are encouraged to seek innovative approaches to reducing both instrument and instrument operation costs, and also the resources required from the Orbiter, Lander, and Rover.

For example, coordination among proposers to optimize the measurement goals of related investigations, and/or to share common hardware, or to coordinate the commanding and operation of their instruments, may lead to useful savings. In addition, investigators are encouraged to reduce costs by proposing, for example, Lander Mission instrument suites that integrate a set of instruments which address several or all of the primary scientific objectives of the Lander Mission. Another approach to U.S. (NASA) cost savings, which proposers are also encouraged to investigate, may be to share payload development costs through international collaboration.

6.6 Technical Approach Requirements

The proposal must address all technical aspects of the investigation from the beginning of funding through delivery of the data for archiving and the publication of results in the peer-reviewed literature. Proposers are encouraged to propose innovative processes, techniques, and activities to accomplish these objectives and to demonstrate cost, schedule, and technical efficiencies.

The PI is responsible for the scientific success of his/her investigation, whether a single instrument or integrated payload. The proposal must describe the technical approach the PI plans to take for every element of his/her investigation to ensure that the investigation does not go out of the bounds of the resources available including cost, that the payload will operate reliably, and that the data can be interpreted.

6.7 Education and Public Outreach

The Mars Surveyor Program represents an opportunity for NASA to use knowledge gained and excitement from its exploration of Mars to increase the science, technology, and mathematics literacy of students and of the American public. Therefore, proposed investigations must include activities that will make significant and measurable contributions to enhance the level of understanding and awareness of Mars exploration by the public. Such public outreach may be accomplished through i) education activities, which might include substantial participation in the investigation by teachers and students, and the development and utilization of programs that would involve educational institutions at any level in the investigation; or ii) through public information programs that will inform the public by mass media or other means, or other innovative ideas for bringing planetary science to the public. This plan will be judged as part of the Evaluation criteria; see Section 7.1. Proposers may wish to refer to the description of the NASA Office of Space Science Education/Public Outreach program given in "*Partners in Education, A Strategy for*

Integrating Education and Public Outreach into NASA's Space Science Programs (March 1995)," and its accompanying implementation plan, entitled "*Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy,"* both of which may be accessed by opening "Publications" from the menu of the Internet host <http://www.hq.nasa.gov/office/oss>.

6.8 Technology Development and Transfer Requirements

The Mars Surveyor Program represents an opportunity for NASA to develop and test new technologies and applications, as well as transfer those technologies and applications to the private sector. Mars Surveyor Missions are expected to help NASA achieve the goal of technology transfer, defined here as the transition of scientific and engineering knowledge from one entity to another for a potentially useful purpose. Emphasis is placed on technology transfer from NASA to the private sector, including the non-aerospace industry, for use in or as a commercial product or process. Proposals must include a description of expected new technology, and how it will be developed, tested, and transferred to the private sector. This plan will be judged as part of the Evaluation criteria; see Section 7.1.

7.0 PROPOSAL EVALUATION, SELECTION, AND IMPLEMENTATION

7.1 Evaluation Criteria

The fundamental aim of the NASA investigation acquisition process is to identify scientific ideas that are tested and verified by unique instrumental and/or analytical capabilities that best suit the overall scientific and cost objectives of the program as described in the AO. The following criteria will be used in evaluating all proposals submitted in response to this AO. Criteria 1, 2, and 3 are the most important, with criteria 1 and 2 having equal and greater weight than criteria 3 and criteria 4-6 listed in order of descending importance. Criteria 4 carries a weight of about 10% for the final score.

1. The scientific and technological merit of the proposed investigation and its relevance to this specific opportunity and to the established mission plans and objectives. The degree to which instrumentation incorporates advanced technology will be considered, as well as the degree to which proposed instrumentation fulfills the data requirements as stated in the AO.

2. The adequacy of the proposed instrument or integrated instrument suite for the proposed investigation, with particular regard to the instrument's or instrument suite's ability to supply the data needed for the investigation within mission constraints such as mass, volume, available energy, available data storage and transmission rates, and sequencing.

3. Total cost, cost realism, and management considerations. Total cost will be considered to include not only that proposed for the instrument development and for data validation, but also the impact of the instrument and the investigation on mission and science operation costs. The technical and cost risk (uncertainty) associated with the investigation will also considered. Due to the program's strict financial constraints, any proposed instrument options that would enhance scientific return but increase cost should be clearly identified and costed. Management aspects include demonstrated capability to adhere to sound business practices.

4. The proposed plan for education/public outreach activities.

5. The competence and relevant experience of the proposer and any proposed investigative team as an indication of their ability to carry the investigation to a successful conclusion,

and the commitment of the proposer's institution, as measured by the willingness of the institution to provide the necessary support (logistics, facilities, etc.) to ensure that the investigation can be completed satisfactorily.

6. Provision for transferring for other uses, potentially new scientific instrument technology developed during the proposed investigation.

In accordance with Section 2.0 of Appendix A, NASA may desire to select only a portion of the proposer's investigation and may also desire the proposer's participation with other investigators in a joint investigation. In this case, the proposer will be given the opportunity to accept or decline such partial acceptance and/or participation with other investigators.

7.2 Evaluation and Selection Procedures

Proposals received in response to this AO will be evaluated in accordance with the provisions of NASA Federal Acquisition Regulations (FAR) Supplement Part 1872, "Acquisition of Investigations", that may be accessed through the Internet host <http://www.hq.nasa.gov/office/procurement/regs/1872.htm>.

7.2.1 Evaluation Process

All proposals will be subjected to a preliminary screening to determine their suitability and responsiveness to the AO. Proposals that are not responsive to the intent of this AO will be handled as technical correspondence and returned without further review. Those proposals that are responsive to the AO will then be subjected to a preliminary technical, management, and cost assessment.

NASA will make use of both the information in the investigator's proposal, and an independent technical and cost evaluation of the proposal provided by an engineering, management, and cost evaluation panel. This panel will assess the cost impact of accommodating the instrument or integrated instrument suite in the mission payload.

Following these preliminary actions, the scientific and technical aspects of each proposal will be assessed by panels composed of reviewers who are scientific and technical peers of the proposers. The purpose of this peer evaluation will be to determine the scientific and technical merit of each proposal, expressed in terms of its strengths and weaknesses. Results of the earlier technical and cost evaluation will be available to these reviewers.

7.2.2 Categorization Process

After all scientific, technical, management, education, and cost evaluations are completed, an *ad hoc* Categorization Subcommittee of the Space Science and HEDS Steering Committee (see further below), consisting of U.S. Civil Servants, will consider the totality of all evaluations in order to categorize the submitted proposals according to the following definitions:

Category I: Well conceived and scientifically and technically sound investigations pertinent to the goals of the program and the AO's objectives and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time and that the data can be properly reduced, analyzed, interpreted, and published in a reasonable time.

Category II: Well conceived and scientifically and technically sound investigations which are recommended for acceptance, but at a lower priority than Category I.

Category III: Scientifically and technically sound investigations which require further development. (Note that it is not considered likely that any Category III proposals will be selected through this AO.)

Category IV: Proposed investigations which are recommended for rejection for this particular opportunity, for scientific, technical, cost, or other reasons.

After the categorization of proposals, representatives of the sponsoring NASA Program Offices and the MSP 2001 Project Offices may visit the proposer's institutions for those proposals rated Category I and II to assess cost realism and development risk and to further clarify the existing proposal(s). Any such visit will not be an opportunity to revise a submitted proposal. Note that if this option is exercised, all proposers in the competitive range will be visited, and all those not in the competitive range will be so notified and offered a debriefing (see also Section 7.3).

7.2.3 Selection Process

Following the evaluations described above, the three NASA Program Offices sponsoring this AO will develop payload recommendations for their respective areas of solicitation. These recommendations, and all peer review and categorization materials on all proposals will be submitted to a Steering Committee composed of U.S. Civil Servants from NASA Headquarters, to review the completeness and adequacy of all materials regarding the review and categorization of proposals, and the soundness and justification for recommendations for selection resulting therefrom. Selections of investigations will be made by the Associate Administrators for Space Science, for Space Flight, and for Life and Microgravity Sciences and Applications in their respective areas of solicitation.

7.3 Implementation Procedures

Immediately following selection appropriate letters of selection or rejection will be sent to all proposers. All proposers will be offered a debriefing concerning the strengths and weaknesses of their proposals. This debriefing may be by telephone or in person at NASA Headquarters at the discretion of the proposer; however, in the latter case, NASA funds may not be used to defray travel costs.

All selected proposers will be contacted immediately by the Mars Surveyor 2001 Project at the Jet Propulsion Laboratory in order to establish a funding mechanism as quickly as possible. In particular, it is expected that all selected PI's will attend a first meeting of the PSG within approximately two weeks of selection notification.

8.0 PROGRAM MANAGEMENT

The Mars Surveyor Program Office is located in the Office of Space Science, NASA Headquarters, Washington, DC. The Mars Surveyor 2001 Project is managed by the Mars Exploration Directorate at the Jet Propulsion Laboratory, Pasadena, California, which also manages Mars Pathfinder, Mars Global Surveyor, and Mars Surveyor 1998. The Mars Exploration Directorate is responsible for implementation of the MSP 2001 Orbiter, Lander, and Rover Missions, and the operation of Mars Surveyor Missions through the Mars Surveyor Operations Project. Lockheed-Martin Company is the spacecraft contractor for the MSP 2001 Orbiter and Lander, and the Jet Propulsion Laboratory is the contractor for the MSP 2001 Rover.

9.0 CONCLUSION

The objectives of these Missions are wide ranging and represent significant steps forward in the systematic study of Mars: to continue the orbital reconnaissance of Mars and prepare for the selection of sites to be explored on the surface; to investigate with a roving vehicle sites in the ancient martian highlands at which samples will be selected, analyzed, and collected; and to characterize aspects of the martian environment and demonstrate several technologies that are key to the decision of possible exploration of Mars by humans. We invite you to participate in the important and exciting Mars Surveyor Program 2001 Missions.

Wesley T. Huntress, Jr.
Associate Administrator for
Space Science

Jurgen H. Rahe
Science Program Director
Solar System Exploration
Office of Space Science

Arnauld E. Nicogossian
Associate Administrator for
Life and Microgravity Sciences
and Applications

Wilbur C. Trafton
Associate Administrator for
Space Flight

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APPENDIX A

GENERAL INSTRUCTIONS AND PROVISIONS

1.0 Instrumentation and/or Ground Equipment

By submitting a proposal, the investigator and institution agree that NASA has the option to accept all or part of the offeror's plan to provide the instrumentation or ground support equipment required for the investigation, or NASA may furnish or obtain such instrumentation or equipment from any other source as determined by the selecting official. In addition, NASA reserves the right to require use, by the selected investigator, of Government instrumentation or property that subsequently becomes available, with or without modification, that will meet the investigative objectives.

2.0 Tentative Selections, Phased Development, Partial Selections, and Participation With Others

By submitting a proposal, the investigator and the organization agree that NASA has the option to make a tentative selection pending a successful feasibility or definition effort. NASA has the option to contract in phases for a proposed experiment, and to discontinue the investigative effort at the completion of any phase. The investigator should also understand that NASA may desire to select only a portion of the proposed investigation and/or that NASA may desire the individual's participation with other investigators in a joint investigation, in which case the investigator will be given the opportunity to accept or decline such partial acceptance or participation with other investigators prior to a NASA selection. Where participation with other investigators as a team is agreed to, one of the team members will normally be designated as its team leader or contact point.

3.0 Selection Without Discussion

The Government reserves the right to reject any or all proposals received in response to this Announcement when such action shall be considered in the best interest of the Government. Notice is also given of the possibility that any selection may be made without discussion (other than discussions conducted for the purpose of minor clarification). It is, therefore, emphasized that all proposals should be submitted initially on the most favorable terms that the offeror can submit.

4.0 Non-U.S. Proposals

Guidelines for non-U.S. responses to this Announcement of Opportunity are presented in Appendix B, Section 3.0. Requirements for PI/Instrument proposals involving U.S./non-U.S. collaboration are summarized below:

4.1 Non-U.S. Proposals with U.S. Co-I's

In cases where the participation of a U.S. individual is included in a PI/Instrument proposal submitted by a non-U.S. individual, and where it is anticipated that such participation will be supported by NASA, a Management and Cost Plan covering such participation must be submitted to NASA as part of the proposal. This Management and Cost Plan must be signed by the U.S. individual and certified by the U.S. individual's institution. Such costs will be considered in the review and evaluation of proposals submitted by non-U.S. individuals.

4.2 U.S. Proposals with Non-U.S. Co-I's

Non-U.S. individuals who plan to participate as Co-Investigators on a U.S. PI/Instrument proposal must have such participation reviewed and endorsed by their appropriate governmental agency before such participation can be selected. Evidence of such review and endorsement should be provided at the time that the proposal is submitted or as soon as possible thereafter. Formal arrangements for such participation will be made by NASA's International Relations Division after selection of the investigation.

5.0 Treatment of Proposal Data

It is NASA policy to use information contained in proposals and quotations for evaluation purposes only. While this policy does not require that the proposal or quotation bear a restrictive notice, offerors or quoters should, in order to maximize protection of trade secrets or other information that is commercial or financial and confidential or privileged, place the following notice on the title page of the proposal or quotation and specify the information, subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information (data) contained in proposals and quotations will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

**Restriction on Use and Disclosure of
Proposal and Quotation Information (Data)**

> The information (data) contained in (insert pace numbers or other identification) of this proposal or quotation constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding, that it will not, without permission of the offeror, be used or disclosed for other than evaluation purposes; provided, however, that in the event a contract is awarded on the basis of this proposal or quotation, the Government shall have the right to use and disclose this information to the extent provided in the contract This restriction does not Emit the Government’s right to use or disclose this information (data) if obtained from another source without restriction.

6.0 Status of Cost Proposals (Proposals Requesting NASA Support)

Submission of Standard Form (SF) 1411 "Contract Pricing Proposal Cover Sheet" is required as part of the cost proposal (see Appendix E). The investigator's institution agrees that the cost proposal submitted in response to this Announcement is for proposal evaluation and selection purposes, and that, following selection and during negotiations leading to a definitive contract, the institution will be required to resubmit or execute SF Form 1411 and all certifications and representations required by law and regulation.

7.0 Late Proposals

Proposals received after the deadline given in this Announcement will not be accepted and will be returned to the proposer.

8.0 Source of Space Investigations

Investigators are advised that candidate investigations for space missions can come from many sources. These sources include those selected through the Announcement of Opportunity, those generated by NASA in-house research and development, and those derived from contracts and other agreements between NASA and external entities.

9.0 Disclosure of Proposals Outside Government

NASA may find it necessary to obtain proposal evaluation assistance outside the Government. Where NASA determines it is necessary to disclose a proposal outside the Government for evaluation purposes, arrangements will be made with the evaluator for appropriate handling of the proposal information. Therefore, by submitting a proposal, the investigator and institution agree that NASA may have the proposal evaluated outside the Government. If the investigator or institution desire to preclude NASA from using an outside evaluation, the investigator or institution should so indicate on the cover. However, notice is given that if NASA is precluded from using outside evaluation, it may be unable to consider the proposal.

10.0 Equal Opportunity (U.S. Proposals Only)

By submitting a proposal, the investigator and institution agree to accept the following clause in any resulting contract:

Equal Opportunity

During the performance of this contract, the Contractor agrees as follows:

The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to (a) employment; (b) upgrading; (c) demotion; (d) transfer; (e) recruitment or recruitment advertising; (f) layoff or termination; (g) rates of pay or other forms of compensation; and (h) selection for training, including apprenticeship.

The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, the notices to be provided by the Contracting Officer that explain this clause.

The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. Standard Form 100 (EEO-1), or any successor form, is the prescribed form to be filed within 30 days following the award, unless filed within 12 months preceding the date of award.

The Contractor shall permit access to its books, records, and accounts by the contracting agency or the Office of Federal Contract Compliance Programs (OFCCP) for the purposes of investigation to ascertain the Contractor's compliance with the applicable rules, regulations, and orders.
If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, the contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.

The Contractor shall include the terms and conditions of subparagraph 1 through 9 of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

The Contractor shall take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

11.0 Patent Rights

For any contract resulting from this solicitation awarded to other than a small business firm or nonprofit organization, the clause at NFS 18-52.227-70, "New Technology," shall apply. Such contractors may, in advance of contract, request waiver of rights as set forth in the provision at NFS 18-52.227-73, "Requests for Waiver of Rights to Inventions.

For any contract resulting from this solicitation awarded to a small business firm or nonprofit organization, the clause at FAR 52.227-1 1, "Patent Rights--Retention by the Contractor (Short Form)" (as modified by NFS 18-52.227-1 1) shall apply.

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APPENDIX B

GUIDELINES FOR PROPOSAL PREPARATION AND SUBMISSION

1.0 Proposal Preparation

The following guidelines apply to the preparation of proposals by potential investigators in response to this AO. The material presented is merely a guide for the prospective proposer and it is not intended to be all encompassing. The proposer should provide information relative to those items applicable or as otherwise required by this AO.

In order to provide a firm basis for the comparison of proposals received in response to this AO, the Mars Surveyor 2001 Orbiter, Lander, and Rover capabilities and constraints, the expected flight environments, ground system capabilities and constraints, and requirements for data archiving described in the Proposal Information Package (PIP) must be used for proposal preparation (for information on accessing the PIP, see Section 1.3 of this AO).

A science investigation must be clearly defined. The description of any proposed instrumentation must provide adequate technical information to permit evaluation. In addition, it must specifically address those Orbiter, Lander, or Rover resources, configurations, or special requirements necessary for successful implementation of the proposed investigation. This information should be given in sufficient detail to permit an evaluation of both the concept and the practical feasibility of the investigation. If appropriate, the proposal should describe the heritage of any proposed instrumentation, how the investigation is related to other proposed investigations, and the specific approach being taken to coordinate measurement goals and/or to share instrument hardware. The proposal should describe any technology developments that are anticipated for development of the instrument or instrument suite, and also describe backup strategies in the event that the expected technologies are not available. The proposal should also describe any recognized need for supporting laboratory research or ground-based, airborne, or other activities required to support development of the instrument and its operation during the mission.

The proposal should also contain the best possible description of the proposer's plans for data processing, management, and archiving. Many of the details of these procedures are not established at this time, but the proposal should include as much information as possible concerning the investigator's plans, requirements, and costs, especially those for unique data management requirements (hardware and software).

A uniform proposal format will be required from all proposers in order to aid in proposal evaluation and to facilitate comparative analysis. Therefore, each proposal must be submitted in two separately-bound volumes: Volume 1, Investigation and Technical Plan; and Volume 2, Management and Cost Plan. All documents must be typewritten in English and must be clearly legible. At least one copy of each document should be clear black print on white paper and of a quality suitable for reproduction. Submission of proposal material by facsimile (Fax), electronic media, video tape, floppy disk, etc., is not acceptable.

All proposals must be signed by an institutional official authorized to certify institutional support and sponsorship of the investigation, as well as concurrence in the management and financial parts of the proposal. Additionally, the original, signed copy of all proposals requesting NASA funding must include certifications regarding drug-free workplace requirements, debarment, and lobbying; Appendix C contains the forms for these certifications.

The format required and the required contents are summarized below.

1.1 Volume 1: Investigation and Technical Plan

Volume 1 should consist of the main body of the proposal and any optional appendices. The volume should provide a clear statement of the proposed investigation and how it will address the objectives of the Mars Surveyor 2001 Orbiter, Lander, or Rover Mission. The proposal should contain enough background information to be meaningful to a reviewer who is generally familiar with the field, although not necessarily a specialist.

The title page of Volume 1 must clearly state which of the MSP 2001 Mission elements (Orbiter, Lander, or Rover) are addressed by the proposal.

The title page of Volume 1 must state the title(s), names(s), addresses, affiliation(s), the telephone and Fax numbers, and e-mail addresses of a single Principal Investigator and Co-Investigators. The title page must also contain the authorizing signatures of appropriate officials of participating organizations. Such organizations may include industrial contractors who are part of the proposed team. In the Preface to Volume 1 the proposer must also include the following two pages: (1) a separate abstract, one page or less in length, describing the proposed investigation; and (2) a separate table, one page or less in length, listing the major instrument parameters or specifications of the investigation.

The main body of Volume 1 will generally contain the following:

1. Objectives and Significant Aspects. A brief definition of the proposed investigation objectives, their value, and their relationships to past, current, and future efforts. The history and basis for the proposal and a demonstration of the need for such an investigation. A statement of present development in the discipline field, and areas for insertion of new technology.

2. Investigation Approach. A full description of the concept of the investigation and the method and procedures for carrying out the investigation.

3. Instrumentation. A full description of all information necessary to plan for experiment development, integration, ground operations, and flight operations. Proposers of integrated instrument suites for the Rover must provide a prioritization of their individual instruments. This section must be complete in itself without the need to request additional data. Failure to furnish complete data may preclude evaluation of the proposal.

    i. Payload/Instrument Description. This section should fully describe the instrumentation (instruments and any associated deployment/mobility/sampling devices) and indicate items which are proposed to be developed, as well as any existing instrumentation. Performance characteristics should be related to the experiment objectives as stated in the proposal.

    ii. Payload/Instrument Integration. This section should describe all parameters of the instrument pertinent to the accommodation of the instrument in the spacecraft. These include, but are not limited to: volumetric envelope (including view angle requirements), weight, power, and energy requirements, thermal requirements, telemetry requirements, sensitivity to or generation of contamination (e.g., electromagnetic interference, gaseous effluent), data processing requirements. Energy requirements and a time profile of power requirements should be described.

iii. Prioritization of Individual Instruments of Integrated Rover Payloads. Proposers of integrated scientific instrument suites for the Rover must prioritize individual scientific instruments.

iv. Ground Operations. This section should identify requirements for pre-launch or post-launch ground operations support, science site implementation, and configuration control.

v. Flight Operations. This section should identify any requirements for flight operations support including instrument testing, calibration, and mission planning. Describe any special communications or near real-time around support requirements and indicate any special equipment or skills required of ground personnel.

4. Data Reduction and Validation. A discussion of the data reduction and validation plan including, insofar as possible, the method and format. The plan should include a schedule for the submission of reduced and validated data, as specified in this Announcement of Opportunity, and the plan for submission of final interpretive papers to the peer-reviewed literature.

5. Education/Public Outreach. Provisions and plans for education and public outreach activities of the proposed investigation, arrangements for appropriate partners and alliances, implementation of the education/outreach program, dissemination of education/outreach products and materials.

6. Roles and Responsibilities. The specific roles and responsibilities of the PI and of each Co-Investigator, along with a time-phasing of their activities. Because the number of participants will be limited, each participant must have an identified specific function that makes a demonstrable contribution to the development and/or implementation of the investigation. A condensed description of all prospective participants' relevant background, experience, and selected publications (if appropriate) should be provided.

Volume 1 is limited to 25 pages for proposals for individual instruments and 75 pages for proposals for integrated suites of instruments. Appendices are limited to a total of 5 single-spaced, typewritten pages, without reduction for single instrument proposals, and 15 pages for instrument suite proposals. In complying with page limits, no page should contain more than 50 lines of text, and the type size should not be smaller than 10-point font, with a minimum margin of 2.5 cm on all sides. Each side of a sheet of paper containing text or figures is considered a page.

1.2 Volume 2: Management and Cost Plan

The management plan sets forth the investigator's approach for managing the work, the recognition of essential management functions, and the overall integration of these functions in order to meet the established review and delivery dates. It provides insight into the organization proposed for the work, including the internal operations and lines of authority with delegations, together with internal interfaces and relationships with NASA, major subcontractors, and associated investigators. This volume is limited to 25 pages for proposals for individual instruments and 50 pages for proposals for integrated instrument suites.

The following items must be supplied in Volume 2.

Draft Version

1. Method of Instrument/Payload Acquisition. Volume 2 must describe the proposed method of instrument acquisition. Specifically, it must include the following, as applicable:

   (i) Rationale for the investigator to obtain the instrument/payload through or by the investigator's institution.

   (ii) Method and basis for the selection of the proposed instrument/payload fabricator.

   (iii) Unique or proprietary capabilities of the instrument/payload fabricator that are not available from any other source.

   (iv) Contributions or characteristics of the proposed fabricator's instrument/payload that make it an inseparable part of the investigation.

   (v) Availability of supporting personnel in the institution to successfully administer the instrument/payload contract and technically monitor the fabrication.

   (vi) Status of development of the instrument/payload, e.g., what additional development is needed. Areas that need further design or in which unknowns are present. Backup options for any function or hardware requiring technology development.

   (vii) Method by which the investigator proposes to:

      (a) Prepare instrument/payload hardware and software specifications.

      (b) Review development progress and maintain configuration control.

      (c) Review design and fabrication changes.

      (d) Participate in testing program.

      (e) Participate in final checkout and calibration.

      (f) Provide for integration of instrument/payload.

      (g) Support the flight operations.

      (h) Coordinate with Co-Investigators, other related investigations, and the payload integrator.

      (i) Assure safety, reliability, quality and product assurance.

      (j) Control cost

   (viii) For proposals seeking NASA funding, planned participation by small and/or minority business in any subcontracting for instrument fabrication or investigative support functions.

All major facilities, laboratory equipment, and ground-support equipment (GSE) (including those of the investigator’s proposed contractors and those of NASA and other U.S. Government agencies) essential to the experiment in terms of its system and subsystems are to be indicated, distinguishing insofar as possible between those already in existence and those that will be developed in order to execute the investigation. The outline of new facilities and equipment should also indicate the lead time involved and the planned schedule for construction, modification, and/or acquisition of the facilities.

2. Schedules and Responsibilities. Volume 2 must include schedules necessary for the logical and timely pursuit of the work, accompanied by a description of the investigator's work plan and deliverables to the Mars Surveyor 2001 Orbiter, Lander, or Rover Mission, and the responsibilities of the Co-Investigators. A discussion must be provided of the specific roles that each of the participants and their institutions intend to play in the investigation. This discussion should include a statement of the portion of time which each participant expects to devote to the investigation and of the institutional resources on which each can draw.

3. Cost Plan For Proposals Requesting NASA Support. Volume 2 must also provide a detailed estimate of the total cost of the investigation and cost spread per Government Fiscal Year, along with sufficient technical information on which to judge the reliability of the figures. The assumptions on which the estimate is based should be stated, particularly with regard to Government-furnished equipment and services. Reserve should be shown explicitly. Details on Cost Proposal Certifications are provided in Appendix B (General Instructions and Provisions) to this AO.

In addition to submitting the SF 1411 the cost plan should summarize, in real-year dollars, and by Government Fiscal Year (October 1 to September 30), the total investigation cost by major categories of cost as well as by function.

The categories of cost should include the following:

a. Direct Labor. List by labor category, with labor hours and rates for each. Provide actual salaries of all personnel and the percentage of time each individual will devote to the effort.

b. Overhead. Include indirect costs which, because of their incurrence for common or joint objectives, are not readily subject to treatment as a direct cost. Usually this is in the form of a percentage of the direct labor costs.

c. Materials. This should give the total cost of the bill of materials, including estimated cost of each major item. Include lead time of critical items.

d. Subcontracts. List those over $5,000, specify the vendor and the basis for estimated costs. Include any baseline or supporting studies.

e. Special Equipment. Include a list of special equipment with lead and/or development time. Include number of units and types.

f. Travel. List estimated number of trips, destinations, duration, purpose, number of travelers, and anticipated dates.

g. Other Costs. Costs not covered elsewhere.

h. General and Administrative Expense. This includes the expenses of the institution's general and executive offices and other miscellaneous expenses related to the overall business.

i. Fee (if applicable).

Cost summaries should be attached to show total cost allocable to the following by Government Fiscal Year:

a. PI and Co-I Costs for Science Support. Includes all efforts associated with overall investigation management; support of the Mars Surveyor 2001 PSG; the development of calibration requirements (but not calibration itself); the planning for the mission operations/data analysis phase, including necessary pre-launch development of ground software required only for post-launch activities; costs for education/public outreach. This category begins on October 1, 1997, and ends on April 30, 2001 (approximately Launch plus 30 days).

b. Hardware Costs. Consists of all efforts, including field support at JPL, associated with the design, fabrication, test, calibration, operation and maintenance of the flight instrument(s), enabling devices and a suitable complement of spare components (and functional or nonfunctional models such as Engineering, Models and Temperature Control Models if proposed); the design, development, test, operation, and maintenance of instrument ground support equipment; the design, test, and maintenance of instrument and support equipment software; support to the Project regarding matters related to the integration of the flight instrument with the spacecraft; and the engineering management of the foregoing efforts. This category begins on October 1, 1997, and ends on April 30, 2001.

c. Science Operations/Generation and Validation of Data Products/Data Analysis Costs. Includes all costs associated with the investigation, beginning on May 1, 2001, including support of the PSG, science operations, computer time, and data reduction, generation, validation, and archiving of Data Products, and education/public outreach. As with science support, it also includes investigator support of the PSG working groups, but in the period from May 1, 2001, until December 31, 2003.

1.3 Certification

All proposals must be signed by an institutional official authorized to certify institutional support and sponsorship of the investigation as well as of the management and financial parts of the proposal. In addition, Certifications regarding Drug-Free Workplace; Debarment, Suspension and Other Responsibility Matters; and Lobbying must accompany each proposal. Forms for submission of these three Certifications are included as Appendix C.

2.0 Proposal Submission

The requirements for the submission of proposals from both U.S. and non-U.S. institutions in response to this Announcement of Opportunity are given in Section 1.4 of this AO.

3.0 Proposals From Non-U.S. Institutions

The following guidelines are established for non-U.S. responses to this Announcement of Opportunity.

Proposals from institutions outside the United States must be typewritten in English and in the same format as U.S. proposals. Proposers from non-U.S. institutions are not required to submit a Cost Plan unless U.S. individuals seeking NASA support are involved in the proposal; however, a Management Plan must be submitted.

In cases where the participation of a U.S. individual is included in a proposal submitted by a non-U.S. individual, and where it is requested that such participation be supported by NASA, a Management and Cost Plan covering such participation must be submitted to NASA as part of the proposal. This Management and Cost Plan must be signed by the U.S. individual and certified by the U.S. individual's institution. Such costs will be considered in the review and evaluation of proposals submitted by non-U.S. individuals.

Proposers from non-U.S. institutions must have their proposals reviewed and endorsed by their appropriate sponsoring government agency. Such endorsement by a non-U.S. organization must indicate that:

1) The proposal merits careful consideration by NASA; and

2) If the proposal is selected, sufficient funds will be available to undertake the activity proposed.

A letter of endorsement from the non-U.S. Governmental agency must be submitted to NASA and one copy of the proposal must be sent to:

Ms. Bettye Jones
Mars Surveyor 2001 Program
International Science and Aeronautics Division
Code IS
NASA Headquarters
Washington, DC 20546-0001
USA

All proposals from non-U.S. institutions will compete on an equal basis with U.S.-originated proposals, and go through the same review, evaluation, and selection process. For those non-U.S. proposals selected, NASA will arrange with the sponsoring agencies for participation on a cooperative (no exchange of funds) basis, in which NASA and the sponsoring agencies will each bear the cost of discharging its respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

1) A letter of notification by NASA; and

2) An exchange of letters between NASA and the sponsoring non U.S. government agency; or

3) A Memorandum of Understanding between NASA and the sponsoring non U.S. government agency.

APPENDIX C

CERTIFICATION FORMS

For all proposals requesting NASA funding, Certifications regarding Debarment, Drug-Free Workplace requirements, and Lobbying must be supplied. The forms supplied in this Appendix may be used by proposers to provide these certifications.

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS PRIMARY COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participants' responsibilities. The regulations were published as Part VII of the May 28, 1988 Federal Register (pages 19160-19211). Copies of the regulations may be obtained by contacting the U.S. Department of Education, Grants and Contracts Service, 400 Maryland Avenue, S.W. (Room 3633 GSA Regional Office Building No. 3), Washington, D.C. 20202-4725, telephone (202) 732-2505.

A. The applicant certifies that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not, within a three-year period preceding this application, been convicted or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or Local) with commission of any of the offenses enumerated in paragraph A.(b) of this certification;

(d) Have not, within a three-year period preceding this application/proposal, had one or more public transactions (Federal, State, or Local) terminated for cause or default; and

B. Where the applicant is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this application.

C. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lowered Tier Covered Transactions (Subgrants or Subcontracts)

(a) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principles is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department of agency.

(b) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name	AO or NRA Number and Title
Printed Name and Title of Authorized Representative	
Signature	Date
Printed Principal Investigator Name	Proposal Title

CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS
Sheet 1 of 2

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85. Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or government-wide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

1. GRANTEES OTHER THAN INDIVIDUALS

A. The grantee certifies that it will provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
(b) Establishing a drug-free awareness program to inform employees about -
(1) The dangers of drug abuse in the workplace;
(2) The grantees policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will
(1) Abide by the terms of the statement; and
(2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;
(e) Notifying the agency within ten days after receiving notice under subparagraph (d) (2) from an employee or otherwise receiving actual notice of such conviction;
(f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d) (2), with respect to any employee who is so convicted --
(1) Taking appropriate personnel action against such an employee, up to and including termination; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or Local health, Law enforcement, or other appropriate agency;
(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e), and (f)

B. The grantee shall insert in the space provided below the site(s) for the performance or work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

____

____

____

Check ______ if there are workplaces on file that are not identified here.

CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS
Sheet 2 of 2

II. GRANTEES WHO ARE INDIVIDUALS

The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance in conducting any activity with the grant.

Organization Name	AO or NRA Number and Title
Printed Name and Title of Authorized Representative	
Signature	Date
Printed Principal Investigator Name	Proposal Title

CERTIFICATION REGARDING LOBBYING

As required by S 1352 Title 31 of the U.S. Code for persons entering into a grant or cooperative agreement over $1 00,000, the applicant certifies that:

(a) No Federal appropriated funds have been paid or will be paid by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, in connection with making of any Federal grant, the entering into of any cooperative, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement;

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting an officer or employee of any agency, Member of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(c) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subgrants, contracts under grants and cooperative agreements, and subcontracts), and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by S1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $1 0,000 and not more than $1 00,000 for each such failure.

____

Organization Name and Title | AO or NRA Number

____

Printed Name and Title of Authorized Representative

____

Signature | Date

____

Printed Principal Investigator Name | Proposal Title