

NASA HEADQUARTERS NEPA CHECKLIST AND RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

1. **Project Name:** ARRA Funded Preliminary Design Activities associated with the Soil Moisture Active and Passive (SMAP) Project HQ ID – 1116
2. **NEPA Contact:** Kathleen Callister, NASA HQ, 202-358-1953
3. **Description of the Proposed Action:** CLARREO is a Tier I Earth Science Decadal Survey Climate Mission, specifically referenced in the ARRA legislation. This funding is critical to CLARREO's ability to provide a feasible technical solution that will satisfy the Climate Science requirements assigned to CLARREO in the Decadal Survey; without this funding increase, completion of the CLARREO mission concept will be delayed by several months. Planned Activities:
 - a. Complete science analyses in support of Level 1 requirements development, supporting CLARREO Mission Concept development, leading to a Mission Concept Review (MCR) planned for February 2010.
4. **Purpose and Need for the Proposed Action:** CLARREO is a Tier I Earth Science Decadal Survey Climate Mission, currently in Pre-Phase A Mission Concept Development. The development of a Climate Measurement System is a primary objective of the Earth Science Division (ESD) of the NASA Science Mission Directorate (SMD). This imperative was articulated in the Decadal Survey Report, and accepted by the ESD. CLARREO is a Tier I mission as expressed in the Decadal Survey.
5. **Does this action fall into one of the following Categorical Exclusions (CATEX) ? YES / NO**
If yes, please indicate which one below:
 - a. Research and development activities in—
 - (1) Space science, other than specific spacecraft development and flight projects,
 - (2) Space and terrestrial applications, other than specific spacecraft development and flight projects,
 - (3) Aeronautics and space technology and energy technology applications, other than experimental projects that have the potential for substantial environmental impacts, and
 - (4) Space transportation systems engineering and scientific and technical support operations, routine transportation operations, advanced studies.
 - b. Enhanced space tracking and data systems,
 - c. Facility planning and design (funding),
 - d. Minor construction of new facilities, including rehabilitation, modification, and repair, and
 - e. Continuing operations of a NASA facility at a level of effort, or altered operations, provided the alterations induce only social and/or economic effects but no or minimal natural or physical environmental effects.
6. **Does the proposed action individually or cumulatively result in any of the following: 1) have significant environmental impacts, 2) result in a high degree of public controversy; or 3) cause NASA to be at risk of violating any Federal, State or local laws ? YES / NO**
 - a. Activities are research and design (administrative) in nature.
7. **Is this action covered under an existing Environmental Assessment (EA)? YES / NO**
If yes, what is the title and date of the EA:

8. Is this action covered under an existing Environmental Impact Statement (EIS)? YES / **NO**

If yes, what is the title and date of the EIS:

9. Comments: Additional NEPA documentation will be necessary for non-ARRA preliminary mission concept activities.

Review and Approval:

Kathleen Callister
NASA NEPA Program Manager

Date

Environmental Checklist:

A. Geology:	Yes	No	Unk/ Maybe
1. Will the project result in more than 10% change in topography or ground surface relief features?		X	
2. Will there be any increase in wind or water erosion of soils, either on or off site?		X	
3. Will there be changes in deposition, siltation, or erosion that may modify the streams or waterways?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
B. Air:	Yes	No	Unk/ Maybe
1. Will there be any air emissions or possible releases (e.g., CO, NOx, O3, Pb, PM, SO2, VOC)?		X	
2. Will there be creation of objectionable odors or smoke?		X	
3. Will there be alternation of air movement, moisture, temperature, or any changes in climate, either locally or regionally?		X	
4. Will there be combustion sources usch as generators, backup generators, paint booths, parts cleaning, solvent cleaning, or any other items that may require a permit?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
C. Water:	Yes	No	Unk/ Maybe
1. Will the project result in surface water runoff (e.9, roofs, parking lots, covers) or change drainage patterns?		X	
2. Will project result in storm water discharges?		X	
3. Will the project require storm water detention ponds?		X	
4. Will the project result in wastewater discharges (e.g., sanitary sewer or industrial operations and maintenance chemical waste)?		X	
5. Will the project have any discharges to the ground?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
D. Cultural Resources:	Yes	No	Unk/ Maybe
1. Will the project affect any historical landmarks?		X	
2. Will the project affect any historical properties (properties eligible or potentially eligible for listing on the National register of Historic Places)?		X	
3. Will the project alter a building that is 50 years old?		X	
4. Is the project located in an area with potential for archeological resources?		X	
5. Will the project have any discharges to the ground?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
E. Biological Resources:	Yes	No	Unk/

			Maybe
1. Will wetlands be affected by the proposed action?		X	
2. Will the project impact any threatened or endangered species?		X	
3. Will the project impact migratory birds?		X	
4. Will the project impact eagles?		X	
5. Does the project have the potential to introduce new species or plants into an area?		X	
6. Does the project involve landscaping or modifications to the existing landscaping?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
F. Noise	Yes	No	Unk/ Maybe
1. Will noise increase greater than 10% from an existing operation?		X	
2. Will people or animals be exposed to noise levels above 80 dBA?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
G. Land Use:	Yes	No	Unk/ Maybe
1. Will there be substantial alteration of the present or planned land use?		X	
2. Will the project interfere with the use or operations of existing facilities?		X	
3. Will there be impacts to any parks or recreational areas?		X	
4. Will the project involve activities that result in a change in the total employment levels greater than 10%?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
H. Hazardous, Toxic, and Radioactive Materials and Wastes:	Yes	No	Unk/ Maybe
1. Will the project involve acquisition, use or storage of any chemicals, toxic materials, or radioactive materials?		X	
2. Will the project generate medical (biohazard), toxic, or radiological wastes?		X	
3. Will the project generate radiation?		X	
4. Will the project acquire, use or store Class I ozone-depleting substances (CFCs, TCA, halons)?		X	
5. Will the project disturb or dispose of PCBs?		X	
6. Will the project use solvent cleaning stations?		X	
7. Will the project use pesticides, insecticides, herbicides, fungicides, or rodenitcides?		X	
8. Will the project install or use any toxic chemical?		X	
9. Will the project install or use any above or underground storage tanks?		X	
10. Will the project use solvent cleaning stations?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
I. Health and Safety:	Yes	No	Unk/ Maybe

1. Is there a risk of exposure to asbestos or lead containing materials?		X	
2. Is there a risk of exposure to medical (biohazard), hazardous, toxic, or radiological materials?		X	
3. Will the project involve confined space entry?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
J. Transportation:	Yes	No	Unk/ Maybe
1. Will the project have substantial traffic impacts?		X	
2. Will the project affect existing parking facilities or demand for new parking?		X	
3. Will the project have a substantial impact upon existing transportation systems?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
K. Services and Utilities:	Yes	No	Unk/ Maybe
1. Will the project require substantial amounts of energy?		X	
2. Will the project require substantial amounts of water?		X	
3. Will the project affect or result in the need for new or altered security services?		X	
Explain any "Yes" or "Unk/Maybe" answers:			
L. Environmental Justice:	Yes	No	Unk/ Maybe
1. Does the project have the potential to disproportionately affect low-income populations or minority populations in the surrounding areas?		X	
Explain any "Yes" or "Unk/Maybe" answers:			

March 8, 2010

TO: Kathleen Callister

FROM: Dr. Eugene H. Trinh

SUBJECT: Categorical Exclusion (CATEX) for American Recovery and Reinvestment Act (ARRA) tasks – SMAP

Attached please find the Record of Environmental Consideration (REC) for the Soil, Moisture Active/Passive Mission (SMAP). This REC is in accordance with direction received from NASA HQ, Environmental Management Division (dated). This REC is unique in the fact that the funds which support these activities are provided under the American Reinvestment and Recovery Act of 2009 (ARRA). These funds have a specific timeframe and therefore NEPA compliance activities need to be complete before the expenditure of all the funds (estimated September 2010).

Previous SMAP task plans have been the subject of Categorical Exclusions (CATEX). These previous task plans are 80-12659, Basic, and 80-12659, Rev A. A REC was generated for follow-on SMAP task plans (80-12659, Rev B and 86-12659, Rev C) which identified SMAP as a candidate for coverage under the NASA Routine Payload Environmental Assessment (NRP EA), estimated for completion in December 2010. Both of these task plans also involved formulation phase activities (Phase A), which did NOT include any specific spacecraft development. Both of these RECs were signed off at the NASA Management Office at JPL.

Per your recommendation, ARRA-funded tasks for SMAP would be processed as a CATEX (see attached REC) and approved at the NASA Management Office at JPL.

February 24, 2010

Dr. Eugene H. Trinh
NASA Management Office
Jet Propulsion Laboratory MS 180-801
4800 Oak Grove Drive
Pasadena, CA 91109

Record of Environmental Consideration for NASA Categorical Exclusions

- 1) Description and location of proposed action: JPL Task Plan No. **86-15017R** entitled **“Soil Moisture Active and Passive (SMAP) Mission American Recovery and Reinvestment Act (ARRA)”**

The proposed effort is to establish preliminary designs for key elements of the Soil Moisture Active/Passive (SMAP) Project and is one of the NASA missions recommended by the 2007 National Research Council Earth Science Decadal Survey report for early implementation. This task completes a set of activities that accelerates development of the SMAP mission.

In the performance of this work, JPL would, for NASA, on a best-efforts, non-interference basis complete the following Preliminary Design Tasks:

- 1) **Complete the Science Data Testbed so that it is available for prototype algorithm development.**
- 2) **Develop the preliminary design for the Spacecraft Flight Software and conduct a Flight Software Architecture & Requirements Review.**
- 3) **Develop the preliminary design for the Spacecraft Telecommunications Subsystem and conduct a Telecommunications Subsystem PDR.**
- 4) **Develop the preliminary design for the Propulsion Subsystem and conduct a Propulsion Subsystem PDR.**
- 5) **Develop the preliminary design for the Spacecraft Power Subsystem and conduct a Power Subsystem PDR.**
- 6) **Develop the preliminary design for the Spacecraft Mechanical and Thermal Subsystem (SMTS) and conduct an SMTS PDR.**
- 7) **Develop the preliminary design for the Guidance and Navigation Control Subsystem (GNC) and conduct a GNC PDR.**
- 8) **Prepare a preliminary Project Verification and Validation Plan.**
- 9) **Prepare a draft Project Implementation Plan.**
- 10) **Develop the preliminary design for the instrument radar subsystem and conduct a radar PDR.**
- 11) **Develop the preliminary design for the Spacecraft Command and Data Handling Subsystem (C&DH) and conduct a C&DH PDR.**
- 12) **Prepare an ARRA Monthly Progress Report in contractor format.**
- 13) **Prepare an ARRA Quarterly Status Report in contractor format.**

The products and deliverables that result from these tasks are summary reports, progress reports, and status reports. Any launch associated with this task would be covered under separate NEPA documentation.

- 2) Anticipated start date and duration of proposed action (estimated):

Start Date: January 2010
Duration: September 2010

3) It has been determined that the above proposed action

- a) Qualifies for Categorical Exclusion as described by paragraph 4.2.1, NPR 8580.1, and NASA NEPA regulations at 14 CFR §1216.305(d), research and development activities in space and terrestrial applications other than specific spacecraft development and flight projects that have the potential for substantial environmental impacts, and has no special circumstances which would suggest a need for an Environmental Assessment. Information supporting this assessment is provided as an attachment to this letter.

Approval:

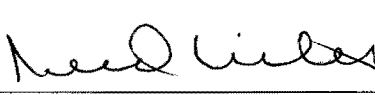


V.S. Ryan, Supervisor
Launch Approval Engineering
Group

3-4-10

Date

Concurrence:

 3/4/10

R. E. Wilcox, Manager
Cross-Program Launch
Approval Engineering

TYPE OF ACTION

NASA Research and Development activities in space and terrestrial applications other than specific spacecraft development and flight projects that have the potential for substantial environmental impacts

DETERMINATION

These proposed actions have been reviewed against the National Environmental Policy Act, the implementing regulations of the Council on Environmental Quality, and the implementing regulations of NASA. Following my review of the proposed action, I have determined that the proposed action may be categorically excluded from further environmental impact analysis pursuant to 14 CFR 1216.305 (d). My signature on this document constitutes a written record of this decision.

Signed: 

Dr. Eugene H. Trinh, Manager, NMO/JPL

Date: 03/05/10

Environmental Evaluation Checklist

(R&D Projects)

PROJECT NAME: Soil Moisture Active and Passive (SMAP) Mission DATE: February 24, 2010
American Recovery and Reinvestment Act (ARRA)

PROJECT CONTACT: Kent Kellogg PHONE NUMBER: (818) 354-5386 MAILSTOP: 321-420
 PROJECT START DATE: January 2010 PROJECT LOCATION: JPL

PROJECT DESCRIPTION: See attached.

ENVIRONMENTAL IMPACTS:

("Yes" responses may require the project to prepare an Environmental Assessment or conduct additional studies)

A. GEOLOGIC:	YES	MAYBE	NO
1. Greater than a 10% change in topography or ground surface relief features?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Any increase in wind or water erosion of soils, either on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Changes in deposition, siltation, or erosion that may modify wetlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explain all "YES" and "MAYBE" answers:			
B. AIR:	YES	MAYBE	NO
1. Substantial air emissions or deterioration of ambient air quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Creation of objectionable odors?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Alteration of air movement, moisture, temperature, or any changes in climate, either locally or regionally?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explain all "YES" and "MAYBE" answers:			
C. WATER:	YES	MAYBE	NO
1. Disturbance of groundwater?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Greater than 10% changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Alter the course or flow of flood waters?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Alteration of the direction or rate of ground waters?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Activities resulting in changes of greater than 10% of Laboratory total potable water use (> 250 gpm)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Any construction or other activity in a floodplain or wetland?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explain all "YES" and "MAYBE" answers:			
D. CULTURAL RESOURCES:	YES	MAYBE	NO
1. Project located in a historic district, in or near a historic property, or affects an existing national historic landmark?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Will Project alter a building that is ≥ 50 years old?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Project located in an area of suspected archeological resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explain all "YES" and "MAYBE" answers:			
E. BIOLOGICAL RESOURCES:	YES	MAYBE	NO
1. Construction/grading/filling within or adjacent to designated wetlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Reduction of the numbers of any rare or endangered species?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Construction/grading/filling within open space or grasslands areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Introduction of new species or plants into an area, or impact the normal replenishment of existing species?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Proposed construction activities in burrowing owl habitat?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Propose new landscaping or modify existing landscaping?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explain all "YES" and "MAYBE" answers:			

Environmental Evaluation Checklist

(R&D Projects)

PROJECT NAME: **Soil Moisture Active and Passive (SMAP) Mission** DATE: February 24, 2010
American Recovery and Reinvestment Act (ARRA)

PROJECT CONTACT: Kent Kellogg PHONE NUMBER: (818) 354-5386 MAILSTOP: 321-420

PROJECT START DATE: January 2010 PROJECT LOCATION: JPL

PROJECT DESCRIPTION: See attached.

ENVIRONMENTAL IMPACTS:

("Yes" responses may require the project to prepare an Environmental Assessment or conduct additional studies)

F. NOISE:	YES	MAYBE	NO
1. Noise increase greater than 10% from an existing operation?			x
2. Exposure of people to severe noise levels (> 80 dBA)?			x
3. Increase existing CNEL noise contours?			x
Explain all "YES" and "MAYBE" answers:			
G. LAND USE:	YES	MAYBE	NO
1. Substantial alteration of present or planned land use?			x
2. Increase in rate of use of any natural resource?			x
3. Activities resulting in changes of greater than 10% of facility energy consumption?			x
4. Activities resulting in a change in total employment levels greater than 10% (> 520 people)?			x
Explain all "YES" and "MAYBE" answers:			
H. HEALTH AND SAFETY:	YES	MAYBE	NO
1. Generation of ionizing or non-ionizing radiation?			x
2. Generation of any air emissions?			x
3. Use of pesticides, including insecticides, herbicides, fungicides or rodenticides?			x
4. Confined space entry?			x
5. Risk of exposure to asbestos or lead-containing materials?			x
6. Result in exposure or disturbance of contaminated soil or ground water?			x
7. Generate industrial waste water or storm water discharge?			x
8. Use of Class 1 ozone depleting substances (CFCs, TCA, halons)?			x
9. Acquisition, use, or storage of any toxic or hazardous substance?			x
10. Generation of medical (biohazard), hazardous, toxic, or radiological wastes?			x
11. Use, disturbance, or disposal of PCBs?			x
12. Use of toxic gas?			x
Explain all "YES" and "MAYBE" answers:			
I. TRANSPORTATION/CIRCULATION:	YES	MAYBE	NO
1. Generation of substantial additional vehicle trips?			x
2. Affect existing parking facilities or demand for new parking?			x
3. Substantial impact upon existing transportation systems?			x
4. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?			x
Explain all "YES" and "MAYBE" answers:			
J. SERVICES:	YES	MAYBE	NO
1. Affect or result in need for new or altered government-provided fire protection services?			x
2. Affect or result in need for new or altered government-provided security services?			x
Explain all "YES" and "MAYBE" answers:			
K. ENVIRONMENTAL JUSTICE:	YES	MAYBE	NO
1. Does the Project have potential to disproportionately affect low income populations or minority populations?			x
Explain all "YES" and "MAYBE" answers:			