

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy
Office of Science
Office of Basic Energy Sciences**

Energy Frontier Research Centers

**Funding Opportunity Number: DE-FOA-0001514
Announcement Type: Amendment 000001
CFDA Number: 81.049**

Issue Date: February 8, 2016

**Letter of Intent Due Date: March 09, 2016 at 5:00 PM Eastern Time
(A Letter of Intent is required)**

Pre-Application Due Date: Not Applicable

Application Due Date: April 19, 2016 at 11:59 PM Eastern Time

The application due date will NOT be extended as a result of this amendment.

Amendment 000001 - Description

Description of amendment:

The purpose of this amendment is to correct an administrative error in section III of the Table of Contents of the initial Funding Opportunity Announcement.

The Table of Contents read as follows:

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A. ELIGIBLE APPLICANTS	11
B. COST SHARING.....	13
C. OTHER ELIGIBILITY REQUIREMENTS... ERROR! BOOKMARK NOT DEFINED.	

The Table of Contents has been corrected, and now reads as follows:

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END OF AMENDMENT DESCRIPTION

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UPDATES AND REMINDERS

DATA MANAGEMENT PLAN

The Office of Science has published a new Statement on Digital Data Management, published at <http://science.energy.gov/funding-opportunities/digital-data-management/>, which governs applications submitted under this FOA, and is detailed in Part IV of this Funding Opportunity Announcement.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

The Office of Science published guidance about how its support should be acknowledged at <http://science.energy.gov/funding-opportunities/acknowledgements/>.

REPORTING

If an award results from an application submitted under this FOA, read the Reporting Checklist contained in the Assistance Agreement carefully. The current version of the checklist is available at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>.

REGULATIONS

On December 26, 2014, 2 CFR part 200, the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards took effect. This FOA and any awards made under it will be controlled by 2 CFR part 200, as amended by 2 CFR part 910, Department of Energy Financial Assistance Regulations, and 10 CFR part 605, the Office of Science Financial Assistance Program. Compliance with the new regulations is mandatory.

RECOMMENDATION

The Office of Science encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent, pre-applications, and applications well before the deadline (See Section IV. H OTHER SUBMISSION AND REGISTRATION REQUIREMENTS of this FOA).

Section I – FUNDING OPPORTUNITY DESCRIPTION

GENERAL INQUIRIES ABOUT THIS FOA:

Questions regarding the content of the FOA must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available on the FedConnect website (www.fedconnect.net).

Questions pertaining to the FedConnect registration process or the submission of questions through FedConnect should be directed by e-mail to support@FedConnect.net or by phone to the FedConnect Support Center at 1-800-899-6665.

STATUTORY AUTHORITY

Public Law 95-91, Department of Energy Organization Act
Public Law 109-58, Energy Policy Act of 2005

APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, codified at 2 CFR 200

U.S. Department of Energy Financial Assistance Rules, codified at 2 CFR 910

U.S. Department of Energy, Office of Science Financial Assistance Program Rules, codified at 10 CFR 605

SUMMARY

The Department of Energy's (DOE) Office of Basic Energy Sciences (BES) announces its interest in receiving applications for new Energy Frontier Research Centers (EFRCs) in scientific research areas relevant to the Department's environmental management mission and aligned with the BES core research areas in materials and chemical sciences. More specifically, BES solicits applications in two topical areas: 1) novel and innovative methods for characterization, transformation, and separation of nuclear waste; and 2) new materials for long-term storage of nuclear waste, including waste forms. Research related to contaminant fate and transport in subsurface geological environments is outside the scope of this FOA. The goal of this FOA is to initiate new multi-investigator, multi-disciplinary EFRCs aimed at accelerating scientific breakthroughs in areas that will be likely to have a dramatic impact on the cost and efficacy of future technologies for nuclear waste cleanup and storage. Funding will be competitively awarded to the successful EFRC applications selected by Federal officials, based on a rigorous merit review process as detailed in Section V of this FOA.

SUPPLEMENTARY INFORMATION

Background

BES established the EFRC program in 2009. These integrated, multi-investigator centers involve collaborations among researchers at universities, national laboratories, nonprofit organizations, and for-profit firms. The EFRCs have conducted fundamental research focused on one or more “grand challenges” and use-inspired “basic research needs” identified in major strategic planning efforts by BES and the scientific community. These centers bring together the skills and talents of teams of investigators to perform energy-relevant basic research with a scope and complexity beyond that possible in standard single-investigator or small-group projects. The multi-investigator, multi-disciplinary nature of these centers fosters an environment that encourages innovations and accelerates scientific breakthroughs.

Among the challenges facing the DOE is the safe, effective, and efficient cleanup of the hazardous waste left behind by nearly five decades of nuclear weapons Research and Development during the 20th century. The responsibility for this effort falls primarily on the Office of Environmental Management (EM), which has made great strides over the last 25 years, with cleanup efforts completed at many sites. However, completion of the EM mission at the remaining sites represents an enormous challenge that will require many decades and billions of dollars. In December 2014, the Secretary of Energy Advisory Board (SEAB) Task Force on Technology Development for Environmental Management concluded that entirely new technologies are needed to allow EM to complete its mission more efficiently and safely, and in a timely and cost effective manner. The Task Force report also recognized that these advances would require new fundamental scientific understanding as a foundation on which future, transformative environmental management technologies will be built.

Establishing Priority Directions for Basic Research Relevant to Environmental Management

The mission of the BES program is to support fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support DOE’s mission in energy, the environment, and national security. BES has long invested in innovative basic research to advance the DOE mission through BES’s core research areas. The research disciplines that BES supports—condensed matter and materials physics, chemistry, geosciences, and targeted aspects of biosciences—are those that discover new materials and design new chemical processes that touch virtually every important aspect of energy resources, production, conversion, transmission, storage, efficiency, and waste mitigation.

In 2001, the Basic Energy Sciences Advisory Committee (BESAC) conducted a far-reaching study to assess the scope of fundamental scientific research that must be considered to address the DOE mission. The scientific community responded to this BESAC study with enthusiasm through participation in a weeklong workshop, the results of which were published in early 2003 in the report, *Basic Research Needs to Assure a Secure Energy Future*. That report inspired a series of “*Basic Research Needs*” workshops involving participants from universities, industry, and federal laboratories. Together, these workshop reports highlight the remarkable scientific evolution that

has taken place during the past few decades. The resulting scientific challenges describe a new era of science in which materials functionalities are designed to specifications and chemical transformations are manipulated at will.

In July 2015, BES, along with the Offices of Biological and Environmental Research (BER) and Advanced Scientific Computing Research (ASCR), organized the latest in this series of *Basic Research Needs* workshops, with an emphasis on science for environmental management. The resulting report, *Basic Research Needs for Environmental Management*, can be found here: http://science.energy.gov/~media/bes/pdf/reports/files/BRNEM_rpt.pdf

This report lays out key priority research directions (PRDs) that are most likely to have a dramatic future impact on cleanup and long-term storage of nuclear waste, including the following five that are relevant to this FOA:

- Elucidating and exploiting complex speciation and reactivity far from equilibrium
- Understanding and controlling chemical and physical processes at interfaces
- Harnessing physical and chemical processes to revolutionize separations
- Mechanisms of materials degradation in harsh environments
- Mastering hierarchical structures to tailor waste forms

Applications submitted in response to this FOA must propose research to address one or more of these PRDs. However, research related to contaminant fate and transport in subsurface geological environments is outside the scope of this FOA.

Science “Grand Challenges” and “Transformative Opportunities”

The BES mission to direct and control matter at the electronic, atomic, and molecular levels, requires new insights into the complexity that governs material properties and processes at the quantum level. Following the initial Basic Research Needs workshops described above, an additional workshop examined the primary roadblocks to progress and resulted in the following report, which defined five “**grand challenges**” for science:

Directing Matter and Energy: Five Challenges for Science and the Imagination.
http://science.energy.gov/~media/bes/pdf/reports/files/gc_rpt.pdf

In this report, a new era for energy science was posed in five “**grand challenges**”:

- *How do we control material processes at the level of electrons?*
- *How do we design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties?*
- *How do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how can we control these properties?*
- *How can we master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things?*

- *How do we characterize and control matter away – especially very far away – from equilibrium?*

In 2015, in response to a charge to revisit this so-called “grand challenge” report, BESAC convened a committee of experts and issued the following report:

Challenges at the Frontiers of Matter and Energy: Transformative Opportunities for Discovery Science.

http://science.energy.gov/~media/bes/besac/pdf/Reports/CFME_rpt_print.pdf

This report identified five “**transformative opportunities**” for discovery science:

- *Mastering Hierarchical Architectures and Beyond-Equilibrium Matter*
- *Beyond Ideal Materials and Systems: Understanding the Critical Roles of Heterogeneity, Interfaces, and Disorder*
- *Harnessing Coherence in Light and Matter*
- *Revolutionary Advances in Models, Mathematics, Algorithms, Data, and Computing*
- *Exploiting Transformative Advances in Imaging Capabilities across Multiple Scales*

Applications submitted in response to this FOA must propose research that addresses one or more of the “grand challenges” and embodies one or more of the “transformative opportunities.” The full reports from all of the workshops described above are on the following web page:

<http://science.energy.gov/bes/community-resources/reports/>

Purpose and Objectives

1. To implement the scientific recommendations of the reports described above, BES is seeking new applications for EFRCs focused on one or more of the priority research directions identified in the *Basic Research Needs for Environmental Management* and one or more of the “grand challenges” identified in *Directing Matter and Energy: Five Challenges for Science and the Imagination*, while leveraging one or more of the transformative opportunities outlined in *Challenges at the Frontiers of Matter and Energy: Transformative Opportunities for Discovery Science*.

EFRCs bring together the skills and talents of multiple investigators to enable fundamental research of a scope and complexity that would not be possible with a standard individual investigator or small-group research project. As such, the EFRCs strengthen and complement the portfolio of single investigator and small group research projects supported within BES core research areas, as well as larger scale R&D activities supported by the DOE Energy Innovation Hubs. Successful EFRCs drive scientific innovation in areas that are critical to the DOE mission.

Note: The purpose of the EFRC program does not include construction (including new buildings or additions to existing building), and costs for such activities will not be funded by awards resulting from this FOA.

Management, Impact and Output

BES expects the EFRCs to accelerate scientific breakthroughs in areas relevant to the DOE mission by addressing problems with scope, complexity and risk that are beyond the capabilities of single investigator or small-group projects. BES's stewardship of the EFRC projects is an important feature of the program. A variety of methods are used to regularly assess the ongoing progress of the EFRCs, including annual progress reports, monthly phone calls between BES program managers and the EFRC Directors, periodic Directors' meetings, on-site visits by program managers, and in-person reviews by outside experts. BES also organizes periodic Principal Investigators' Meetings to facilitate collaboration and information exchange among the EFRCs. To date, all EFRCs have undergone a management and operations review during the first year of operation, as well as a mid-term scientific progress review approximately half way through each funding cycle; each of these reviews has included external peer reviewers.

The EFRCs should bring together world-class scientists from different disciplines to tackle challenging problems in new ways; to provide an environment that encourages high-risk, high-reward research that would not likely be done otherwise; to integrate synthesis, characterization, theory, and computation to accelerate the rate of scientific progress; to develop new, innovative experimental and theoretical tools that illuminate fundamental processes in unprecedented detail; and to create an enthusiastic, inter-disciplinary community of energy-focused scientists. Successful EFRCs will fully exploit this "team science" model, working closely together in an integrated, centrally managed center to address a well-defined set of scientific challenges with a clear focus and well-defined 4-year scientific research goals.

The primary purpose of the EFRCs is to integrate fundamental and use-inspired science; therefore dissemination of results through peer-reviewed publications is a necessary measure of success. In addition, DOE anticipates that some EFRC basic research will have technological impact. When appropriate, EFRCs are encouraged to file for patent protection. Recipients are also encouraged to explore opportunities to interface with DOE's technology and small business programs or other partners to accelerate the transition of promising scientific results to technology development and commercial applications, though applied research and technology development will not be funded by the EFRC awards.

Definitions

Basic Research: Basic Research is defined as scientific study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. Basic Research, however, may include activities with broad applications in mind.

DOE/NNSA National Laboratories: DOE/NNSA National Laboratories are those laboratories defined as a National Laboratory by Section 2 (3) of the Energy Policy Act of 2005 (EPAAct 05), which are listed below:

- (A) Ames Laboratory
- (B) Argonne National Laboratory
- (C) Brookhaven National Laboratory
- (D) Fermi National Accelerator Laboratory
- (E) Idaho National Laboratory
- (F) Lawrence Berkeley National Laboratory
- (G) Lawrence Livermore National Laboratory
- (H) Los Alamos National Laboratory
- (I) National Energy Technology Laboratory
- (J) National Renewable Energy Laboratory
- (K) Oak Ridge National Laboratory
- (L) Pacific Northwest National Laboratory
- (M) Princeton Plasma Physics Laboratory
- (N) Sandia National Laboratories
- (O) Savannah River National Laboratory
- (P) Stanford Linear Accelerator Center
- (Q) Thomas Jefferson National Accelerator Facility

EFRC Director: The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization (prime applicant/prime recipient) at the time of award . Each EFRC application must identify a single Director; no co-directorship is allowed. The EFRC Director will serve as the primary contact responsible for communications with the DOE Program Manager on behalf of all of the Principal Investigators in the EFRC. The EFRC Director and the DOE Program Manager may establish an agreement for informal technical discussion or information exchange among Principal Investigators and DOE staff. The EFRC Director should commit a substantial amount of his/her time to the EFRC.

Lead Organization: The lead organization is the prime applicant with whom DOE will enter into a prime award relationship. Any teaming arrangement must have only one designated lead organization that will submit a Letter of Intent, and an application on behalf of the team members.

Merit Review: A thorough, consistent, and objective examination of applications based on pre-established criteria by persons who are independent of those submitting the application and who are knowledgeable in the field of endeavor for which support is requested.

Merit Review Panel (MRP): A group of reviewers who are selected by Federal officials based upon their expertise and professional qualifications in one or more of the scientific and technical fields involved in the applications.

Principal Investigator: A Principal Investigator is an individual designated by the lead organization to have the appropriate level of authority and responsibility to direct research to be supported by the award. The lead organization may designate multiple individuals as Principal Investigators who share the authority and responsibility for leading and directing the project,

intellectually and logistically. When multiple Principal Investigators are named, each is responsible and accountable to the lead organization, or as appropriate, to a collaborating organization for the proper conduct of the project or program including the submission of all required reports. The presence of more than one Principal Investigator on an application or award diminishes neither the responsibility nor the accountability of any individual Principal Investigator.

Selection Official: The DOE official authorized to select applications for funding after considering the merit review findings, Federal officials' recommendations, program policy and management factors, and the amount of funds available.

Senior/Key Personnel: A senior/key person is any individual who contributes to the scientific development or execution of a project in a substantive, measurable way, whether or not they receive salaries or compensation under the grant. This definition includes, but is not limited to, the EFRC Director and the Principal Investigators. Senior/key personnel typically have doctoral or other professional degrees. Consultants may also be considered senior/key personnel if they meet this definition. For the EFRCs, effort "as needed" is not an acceptable level of involvement for Senior/Key Personnel.

Section II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE may award a field work authorization, an interagency agreement, or a grant under this FOA. A DOE field work authorization or other appropriate instrument will be awarded to a successful DOE/NNSA National Laboratory Contractor. Participation by non-DOE/NNSA Federal agencies and their Federally Funded Research and Development Center (FFRDC) Contractors will be funded under an interagency agreement (but see Section III. A. ELIGIBLE APPLICANTS). A grant will be awarded to any other successful entity including, but not limited to, universities, nonprofit organizations, and for-profit organizations.

DOE will consider funding multi-institution collaborations under this FOA (see “Team Arrangements” in Section III. D. OTHER ELIGIBILITY REQUIREMENTS).

B. ESTIMATED FUNDING

DOE expects to make multiple EFRC awards for a period of up to four years for each award. Total funding up to \$10,000,000 annually is expected to be available to support the awards from this FOA. DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

Funding for all awards and future budget periods is contingent upon the availability of funds appropriated by Congress.

C. MAXIMUM AND MINIMUM AWARD SIZE

(See B. Estimated Funding section above.)

DOE anticipates that award sizes will range from \$2,000,000 per year to \$4,000,000 per year. The award sizes will depend on the merit review, the number of meritorious applications, and the availability of appropriated funds.

Ceiling

\$4,000,000 per award per year (\$16,000,000 per award for a 4-year period)

Floor

\$2,000,000 per award per year (\$8,000,000 per award for a 4-year period)

D. EXPECTED NUMBER OF AWARDS

(See B. Estimated Funding section above.)

The exact number of awards will depend on the number of meritorious applications and the availability of appropriated funds. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

E. PERIOD OF PERFORMANCE

(See B. Estimated Funding section above.)

Awards are expected to be made for a period of up to four years.

Continuation funding (funding for the 2nd and subsequent budget periods) is contingent on: (1) availability of funds appropriated by Congress and future year budget authority; (2) substantial progress towards meeting the objectives of the approved application; (3) submittal of required reports; and (4) compliance with the terms and conditions of the award. Additionally, funding for the final two years is contingent upon satisfactory completion of an extensive mid-term progress review, which may include an external peer review. BES will use the mid-term progress review to assess the productivity and impact of each EFRC and progress toward meeting the stated four-year scientific research goals.

F. TYPE OF APPLICATION

DOE will only accept new applications under this FOA.

G. VALUE/FUNDING FOR DOE/NNSA NATIONAL LABORATORY CONTRACTORS AND NON-DOE/NNSA FFRDC CONTRACTORS

For grant awards, the value of, and funding for, a DOE/NNSA National Laboratory Contractor, a non-DOE/NNSA FFRDC Contractor, or another Federal agency's portion of the work will not be included in the award to the successful applicant. DOE will fund a DOE/NNSA National Laboratory contractor through the DOE field work authorization system or other appropriate process and will fund non-DOE/NNSA FFRDC Contractors and other Federal agencies through an interagency agreement in accordance with the Economy Act, 31 U.S.C. 1535, or other statutory authority.

H. RESPONSIBILITY

The successful lead organization (prime applicant/awardee) will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the lead organization and any team member, and/or subawardee.

If a sub award is made to a DOE/NNSA National Laboratory Contractor, all Disputes and Claims will be resolved in accordance with the terms and conditions of the DOE/NNSA National Laboratory Contractor's Management and Operating (M&O) contract, as applicable, in consultation between DOE and the lead organization.

If an award is made to another Federal agency or its FFRDC Contractor, all Disputes and Claims will be resolved in accordance with the terms and conditions of the interagency agreement in consultation between DOE and the lead organization.

Section III – ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

1. INDIVIDUALS

U.S. citizens and lawful permanent residents are eligible to apply for funding as a prime recipient (lead organization) or subawardee (team member).

2. DOMESTIC ENTITIES

For-profit entities, educational institutions, and nonprofit entities¹ that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as the lead organization or subawardee (team member).

State, local, and tribal government entities are eligible to apply for funding as the lead organization or subawardee (team member).

DOE/NNSA National Laboratory Contractors are eligible to apply for funding as the lead organization or subawardee (team member).

Non-DOE/NNSA FFRDCs and non-DOE GOGOs are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as the lead organization.

Federal agencies and instrumentalities (other than DOE) are eligible to apply for funding as a subawardee (team member), but are not eligible to apply as the lead organization.

3. FOREIGN ENTITIES

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding under this FOA.

Other than as provided in the “Individuals” or “Domestic Entities” sections above, all lead organizations receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a lead organization, it must designate in the Letter of Intent (LOI) and full application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the lead organization. The LOI and full application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. Foreign entities may request a waiver of this requirement in the full application. See Section IV.C.7. for waiver request information. DOE has discretion to waive this requirement if it determines that it will further the purposes of this FOA and is otherwise in the interests of DOE.

¹Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

A foreign entity, with or without a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a state or territory of the United States, may receive funding as a subawardee (team member).

4. INCORPORATED CONSORTIA

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as the lead organization or subawardee (team member). For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to “Domestic Entities” above. For consortia incorporated in foreign countries, please refer to the requirements in “Foreign Entities” above.

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the DOE Contracting Officer.

5. UNINCORPORATED CONSORTIA

Unincorporated consortia (team arrangements), which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative (lead organization). The prime recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortium's:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

B. COST SHARING

Cost sharing is not required.

C. ELIGIBLE INDIVIDUALS

Individuals with the skills, knowledge, and resources necessary to carry out the proposed research as a Principal Investigator are invited to develop an application. Individuals from underrepresented groups as well as individuals with disabilities are encouraged to apply.

D. OTHER ELIGIBILITY REQUIREMENTS

Letter of Intent (LOI)

To be considered eligible for an award under this FOA, potential lead organizations are required to submit a LOI in accordance with the instructions provided in Section IV.B.1 . Applications received from an applicant who has not submitted the required LOI will be deemed non-responsive and will be rejected without further review.

The lead organization identified in an application must be the same lead organization identified in the required LOI. **If an application is received for which the lead organization has changed since submission of the LOI, then the application will be deemed non-responsive and will be rejected without further review.** The lead Principal Investigator (EFRC Director) should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title of the project. If necessary, the applicant may make changes to other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

Limitation on Number of Applications Submitted by a Lead Organization

An entity may not submit more than one application as the lead organization. **If more than one application is received from an institution, DOE will consider only the first application that matches a qualified LOI (as described below in Section IV.B.1). The remaining applications will be deemed non-responsive and rejected without further review.** However, there is no limitation on the number of applications in which a specific entity may participate as a team member or subcontractor.

Limitation on Number of Applications Submitted by an EFRC Director

The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization. An individual may not be named as the EFRC Director on more than one application. Directors of existing EFRC awards cannot be named as the EFRC Director on any new application in response to this FOA. **If the proposed EFRC Director will not be employed by the lead organization, the application will be deemed non-responsive and will be rejected without further review. Further, if more than one application is received from an applicant identifying the same individual as the EFRC Director, DOE will consider only the application (if any) that matches a qualified LOI (as described in Section IV.B.1).**

The remaining applications will be deemed non-responsive and rejected without further review. However, there is no restriction on the number of applications in which an individual may participate as a Principal Investigator.

Team Arrangements

Entities proposing as a team must designate a lead organization. LOIs and applications must be submitted on behalf of the team members by the lead organization and DOE will enter into a prime award relationship with the designated lead organization. Only one LOI and one application is to be submitted for each team. The designated lead organization, i.e., the prime applicant, must perform a greater percentage of the effort than any other partner organization or subawardee. The percentage of effort will be determined by reviewing the total budget for each participating organization as a percentage of proposed total project costs. **If an application is received in which the lead organization is not performing a greater percentage of the effort than each of the other institutional partners, team members, or subawardees, as determined by the budget, the application will be deemed non-responsive and rejected without further review.**

Eligible/Ineligible Entities

If an application is received that includes an ineligible entity, or an employee of an ineligible entity performing activities as a team member and/or subawardee, the portion of the application attributed to that ineligible entity or employee of an ineligible entity will be deemed non-responsive and rejected without further review. Note, however, that otherwise ineligible entities are not precluded from serving as vendors of materials, supplies, equipment, and providing scientific and technical advisory services to a proposed EFRC, if they are acting purely in that role. Scientific and technical advisory services allow for the provision of scientific and technical expertise without actually performing research activities; examples of such services include serving as members of advisory committees and technical peer review panels or participation in scientific workshops or conferences.

DOE/NNSA National Laboratory Contractors

DOE/NNSA National Laboratory Contractor applicants are eligible to apply for funding as the lead organization or team member under this announcement if their cognizant DOE/NNSA Contracting Officer provides written authorization. This authorization should be submitted with the application as part of the Budget for DOE/NNSA National Laboratory Contractor File. [(This is not required for the National Energy Technology Laboratory because it is a Government Owned/Government Operated (GOGO).] **Please note that failure to provide this authorization may result in rejection of a proposal without merit review.** If a DOE/NNSA National Laboratory Contractor is selected for award, or proposed as a team member, the proposed work will be authorized under the DOE field work authorization system or other appropriate process and performed under the laboratory Contractor's M&O contract, as applicable. The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE/NNSA assigned programs at

the laboratory.”

Failure to submit the authorization with the application may result in rejection of the application without merit review.

Non-DOE/NNSA Federal Agencies and their FFRDC Contractors

Non-DOE/NNSA Federal agencies and their FFRDC contractors are not eligible for a prime award under this announcement, but may be proposed as a team member on another entity's application subject to the following guidelines:

The prime applicant must obtain written authorization for non-DOE/NNSA FFRDC participation. The cognizant Contracting Officer for the Federal agency sponsoring the FFRDC contractor must authorize in writing the participation of the FFRDC contractor on the proposed project and this authorization should be submitted with the application. The written authorization must also contain a determination that the use of a FFRDC contractor is consistent with the contractor's authority under its award and does not place the FFRDC contractor in direct competition with the private sector, in accordance with FAR Part 17.5. **Please note that failure to provide this authorization may result in rejection of a proposal without merit review.** The following wording is acceptable for the authorization:

“Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the (insert agency) assigned programs at the laboratory. This laboratory is authorized to perform the work proposed in the application submitted under DOE Funding Opportunity Announcement # DE-FOA-0001514 by the following statutory authority (insert statute name, citation, and section) .”

Failure to submit the authorization with the application may result in rejection of the application without merit review.

Performance of Work in the United States

DOE requires all work performed by the prime recipient under funding agreements resulting from this FOA to be performed in the United States – i.e., a prime recipient must expend 100% of its total project costs in the United States.

This requirement does not apply to travel or to equipment, materials and supply purchases. Like all proposed costs, proposed travel, equipment, and material and supply costs will be evaluated to determine whether the costs are necessary and appropriate for the conduct of the effort. Furthermore, it is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under awards resulting from this FOA should be American-made.

Work funded as a subaward from the prime recipient may be performed outside of the United

States.

Applicants may request a waiver of this requirement. To do so, applicants must include a written waiver request in the full application. DOE has discretion to waive this requirement if it determines that it will further the purposes of this FOA and is otherwise in the interests of DOE. See Section IV.C.7 of the FOA for waiver request information.

DATA MANAGEMENT PLAN:

A Data Management Plan as described in Section IV. “Application Contents and Forms” - Appendix 6, is required. Applications that do not have a Data Management Plan will be deemed nonresponsive and will be not reviewed.

Section IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants”, and then select “Download Application Package.” Enter the CFDA number (81.049) and/or the funding opportunity number (DE-FOA-0001514) shown on the cover of this FOA and then follow the prompts to download the application package.

Applications submitted through www.FedConnect.net will not be accepted.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent (LOI)

DUE DATE:

March 9, 2016 at 5:00 PM Eastern Time

A Letter of Intent (LOI) is *required* for all applications. Any **application received for which there is not an associated LOI will be deemed non-responsive and will be rejected without further review.** In addition, the lead organization identified in the full application must be the same lead organization identified in the LOI. **If an application is received for which the lead organization has changed since submission of the LOI, the application will be deemed non-responsive and will be rejected without further review.** The lead PI (EFRC Director) should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title of the project. If necessary, the applicant may make changes to other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

The purpose of the LOI is to help plan the review and the selection of potential reviewers for the applications. For this purpose, the LOI should include a cover page with the following information:

- Letter of Intent Title (this is the EFRC Name)
- Lead Principal Investigator Name, Job Title (this is the EFRC Director)
- Lead Organization
- Lead Principal Investigator Phone Number and Email Address
- Funding Opportunity Announcement Number: DE-FOA-0001514
- Grand Challenge(s) addressed by EFRC (list one or more of the following):
 - *How do we control material processes at the level of electrons?*
 - *How do we design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties?*
 - *How do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how can we control these properties?*

- *How can we master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things?*
- *How do we characterize and control matter away – especially very far away – from equilibrium?*
- Transformative Opportunity(s) addressed by EFRC (list one or more of the following):
 - *Mastering Hierarchical Architectures and Beyond-Equilibrium Matter*
 - *Beyond Ideal Materials and Systems: Understanding the Critical Roles of Heterogeneity, Interfaces, and Disorder*
 - *Harnessing Coherence in Light and Matter*
 - *Revolutionary Advances in Models, Mathematics, Algorithms, Data, and Computing*
 - *Exploiting Transformative Advances in Imaging Capabilities across Multiple Scales*

This cover page must be signed by an official of the lead organization who has the authority to commit institutional/entity support for the application and by the proposed EFRC Director. For DOE National Laboratory contractor applicants, the institutional/entity official who signs the cover page should be the Laboratory Director. For other applicants, the official who signs the cover page should be someone who has authority over research activities for the entire institution/entity, such as the Vice President for Research, Chief Technology Officer, or the equivalent. **All applicants must provide both of these signatures on the LOI.** Applicants that fail to provide both signatures on the LOI must provide a corrected LOI with both signatures on or before April 1, 2016 in order for their full application associated with the LOI to be considered for award.

The cover page should be followed by a clear and concise description of the goals, objectives and technical approaches of the proposed research. The description of the proposed research should not exceed two pages (excluding the cover page) when printed on 8.5 X 11 inch paper, with a minimum text font size no smaller than Times New Roman 12 point and margins no smaller than one inch on all sides. Any figures and references, if included, must fit within the two-page limit.

In addition, the LOI should include the following two Tables, which will not count toward the two-page limit for the LOI:

Table 1: Senior/key personnel on the application and institutional affiliations

Senior/Key Personnel			Institution
Last Name	First Name	Title	Institution Name

Table 2: Collaborators for senior/key personnel on the application

Collaborator			Institution
Last Name	First Name	Title	Institution Name

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* Table 2 must include co-authors over the past 48 months, graduate and postdoctoral advisors of the senior/key personnel, graduate students and postdoctoral associates who have been supervised by the senior/key personnel during the past 60 months, and any other current close associations of the senior/key personnel. Table 2 should exclude all personnel at any of the institutions listed in Table 1.

** Applicants are strongly encouraged to follow the exact format of the sample tables because the tabular information will be compiled across all applications. This includes the following elements:

- Include grid lines around each cell.
- Do not merge name or institution cells, even if individuals share the same institution.
- Do not change the order of the columns.
- Do not include any additional information (e.g. “PI”, “Co-PI”, or footnote symbols) under “Last Name” and “First Name”.
- Do not include departmental affiliations under Institutions.
- If an individual has a joint appointment, separate the institutions with a “/” (i.e. “Univ of X / National Lab Y”).

Limitation on Number of Letters of Intent Submitted by Each Lead Organization

An entity may not submit more than one LOI as the lead organization. **If more than one qualified LOI is received from a lead organization, DOE will consider the first qualified LOI received based on the PAMS date and time stamp. The remaining LOIs will be deemed non-responsive and the applicant will not be allowed to submit full applications tied to those LOIs.** However, there is no limitation on the number of LOIs in which an entity may participate as a team member or subcontractor.

Limitation on Number of Letters of Intent Submitted by an EFRC Director

The EFRC Director is the lead Principal Investigator and must be employed or have an agreement in place to be hired by the lead organization in the event of award. An individual may not be named as the EFRC Director on more than one LOI. Directors of existing EFRC awards may not be named as the EFRC Director on any new application in response to this FOA. **If more than one qualified LOI is received from an applicant identifying the same individual as the EFRC Director, DOE will consider the first qualified LOI received based on the PAMS date and time stamp. The remaining LOIs will be deemed non-responsive and the applicant will not be allowed to submit full applications tied to those LOIs. If an LOI is received from an applicant identifying as the EFRC Director an individual who serves as the EFRC Director of a an active EFRC grant award, that LOI will be deemed non-responsive and the applicant will not be allowed to submit a full application tied to that LOI.** However, there is no restriction on the number of LOIs in which an individual may participate as a Principal Investigator.

All LOIs received by DOE will be acknowledged by an automated email to the lead Principal Investigator (EFRC Director). LOIs that are deemed responsive will receive no additional notification.

Any individual named as the Lead Principal Investigator (EFRC Director) on a LOI that is found to be non-responsive to the LOI requirements will be notified by April 4, 2016 and the lead organization will be ineligible to submit a full application associated with that LOI.

The LOI must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website: <https://pamspublic.science.energy.gov/>. It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The Lead Principal Investigator, who is the EFRC Director, and anyone submitting on behalf of the Lead Principal Investigator must register for an account in PAMS prior to submitting a LOI. **All Lead Principal Investigator s and anyone submitting LOIs on behalf of Lead Principal Investigator s for a lead organization are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.**

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

Create PAMS Account:

To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.

PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.

Register to Your Institution:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase

you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)

- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

Submit Your Letter of Intent:

- Create your letter of intent outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.
- Log into PAMS and click the Proposals tab. Click the “View / Respond to Funding Opportunity Announcements” link and find the current announcement in the list. Click the “Actions/Views” link in the Options column next to this announcement to obtain a dropdown menu. Select “Submit Letter of Intent” from the dropdown.
- On the Submit Letter of Intent page, select the institution from which you are submitting this LOI from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select one and only one Principal Investigator (PI) per LOI (the EFRC Director); to do so, click the “Select PI” button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter an optional personal message to the PI in the “Comments” box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the “Save” button at the bottom of the screen. It will be stored in “My Letters of Intent” for later editing.
- Enter a title for your letter of intent.
- Select the appropriate technical contact from the Program Manager dropdown.
- To upload the LOI file into PAMS, click the “Attach File” button at the far right side of the screen. Click the “Browse” (or “Choose File” depending on your browser) button to search for

your file. You may enter an optional description of the file you are attaching. Click the “Upload” button to upload the file.

- At the bottom of the screen, click the “Submit to DOE” button to save and submit the LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the LOI.

You are encouraged to register for an account in PAMS at least a week in advance of the LOI submission deadline so that there will be no delays with your submission.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001514**.

2. Pre-application

A pre-application is not required or invited.

C. APPLICATION CONTENT AND FORMS

APPLICATION PREPARATION

You must download the application package, application forms and instructions, from Grants.gov at <http://www.grants.gov/>.

You are required to use the compatible version of Adobe Reader software to complete a Grants.gov Adobe application package. To ensure you have the Grants.gov compatible version of Adobe Reader, visit the download software page at http://www.grants.gov/help/download_software.jsp.

You must complete the mandatory forms and any applicable optional forms [(e.g., Disclosure of Lobbying Activities (SF-LLL))] in accordance with the instructions on the forms and the additional instructions below.

Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this FOA. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not attach PDF portfolios.

Personally Identifiable Information: Do not include sensitive personally identifiable information such as a Social Security Number, date of birth, or city of birth anywhere within the application package, including within any of the appendices. Do not include information not needed by a merit reviewer.

Letters of Recommendation: Letters of recommendation are discouraged and will not be reviewed by DOE.

1. SF424 (R&R)

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 17 is available on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

2. RESEARCH AND RELATED Other Project Information

a. Complete questions 1 through 6.

Note concerning question 4.a.

DOE understands the phrase in field 4.a., “potential impact – positive or negative- on the environment,” to apply if the work described in the application could potentially have any of the impacts listed in (1) through (5) of [10 CFR PART 1021, Appendix B, Conditions that Are Integral Elements of the Classes of Action](#). (click on the preceding link to go directly to Appendix B or navigate from the website: <http://www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR>)

Additionally, for actions which could have any other high consequence impacts to the environment or have any possibility for high consequence impacts to human health (e.g., use of human subjects, Biosafety Level 3-4 laboratory construction/operation, manufacture or use of certain nanoscale materials which are known to impact human health, or any activities involving transuranic or high level radioactive waste or materials or exposure to any radioactive materials beyond de minimis levels), applicants should indicate “potential impact on the environment.”

Lastly, if there would be 1) extraordinary circumstances (i.e., scientific or public controversy) related to the significance of environmental effects (10 CFR 1021.410 (b)(2)), 2) if the work is connected to other actions with potentially significant impacts (10 CFR 1021.410 (b)(3), or 3) if the work is related to other nearby actions with the potential for cumulatively significant impacts (10 CFR 1021.410 (b)(3)), applicants should indicate “potential impact on the environment.”

DUNS AND EIN NUMBERS (FIELDS 5 AND 6)

The DUNS and EIN number fields on the SF-424 (R&R) form are used in PAMS to confirm the identity of the individual or organization submitting an application.

- Enter each number as a nine-digit number.
- Do not use hyphens or dashes.
- The Office of Science does not use the twelve-digit EIN format required by some other agencies.

b. Attach Files:

The file attachments must comply with the following instructions:

PROJECT SUMMARY/ABSTRACT (FIELD 7 ON THE FORM)

The project summary/abstract is a summary of the proposed activity suitable for distribution to the public and sufficient to permit potential reviewers to identify conflicts of interest. It must be a self-contained document that includes the EFRC title, the EFRC Director name and institutional affiliation, other Principal Investigators and senior/key personnel and their institutional affiliations, the objectives of the project, a description of the project, including methods to be employed, and the potential impact of the project (i.e., benefits, outcomes). The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than Times New Roman 12 point. To attach a Project Summary/Abstract, click “Add Attachment.”

- Do not include any proprietary or sensitive business information.
- DOE may use the abstract to prepare public reports about supported research.

DOE COVER PAGE (PART OF PROJECT NARRATIVE ATTACHED TO FIELD 8 ON THE FORM)

The project narrative should begin with a cover page that will not count toward the project narrative page limitation. The cover page should include the following items:

- The Project Title (EFRC Name) [This should match or closely match the project title in the LOI]
- Lead Applicant/Institution: [This must match the LOI]
- Street Address/City/State/Zip:
- Postal Address:
- Lead PI (EFRC Director) name, title, telephone number, email: [Lead PI must match the Lead PI identified in the LOI, unless a change was unavoidable]
- Lead Institution Administrative Point of Contact name, telephone number, email:
- FOA Number: **DE-FOA-0001514**
- DOE/Office of Science Program Office: Basic Energy Sciences
- PAMS LOI tracking number:
- Grand Challenge(s) addressed by EFRC (list one or more of the following):
 - *How do we control material processes at the level of electrons?*

- *How do we design and perfect atom- and energy-efficient synthesis of revolutionary new forms of matter with tailored properties?*
- *How do remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how can we control these properties?*
- *How can we master energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things?*
- *How do we characterize and control matter away – especially very far away – from equilibrium?*
- Transformative Opportunity(s) addressed by EFRC (list one or more of the following):
 - *Mastering Hierarchical Architectures and Beyond-Equilibrium Matter*
 - *Beyond Ideal Materials and Systems: Understanding the Critical Roles of Heterogeneity, Interfaces, and Disorder*
 - *Harnessing Coherence in Light and Matter*
 - *Revolutionary Advances in Models, Mathematics, Algorithms, Data, and Computing*
 - *Exploiting Transformative Advances in Imaging Capabilities across Multiple Scales*

The lead organization must be the same lead organization as identified in the required LOI. **If an application is received for which the lead organization has changed since submission of the LOI, then the application will be deemed non-responsive and will be rejected without further review.** The lead PI should not be changed unless unavoidable and only minor edits should be made, if necessary, to the title of the project. If necessary, the applicant may make changes to the other senior/key personnel and other participating institutions, although DOE discourages extensive changes.

On separate pages, as a supplement to the cover page, include the following personnel and summary budget information for all senior/key personnel and all institutions:

Table 1: Senior/key personnel on the application and institutional affiliations

Senior/Key Personnel			Institution
Last Name	First Name	Title	Institution Name

** Applicants are strongly encouraged to follow the exact format of the sample table above because the tabular information will be compiled across all applications. This includes the following elements:

- Include grid lines around each cell.
- Do not merge name or institution cells, even if individuals share the same institution.
- Do not change the order of the columns.
- Do not include any additional information (e.g. “PI”, “Co-PI”, or footnote symbols) under “Last Name” and “First Name”.
- Do not include departmental affiliations under Institutions.
- If an individual has a joint appointment, separate the institutions with a “/” (i.e. “Univ of X / National Lab Y”).

Table 2: Summary budget information for lead institution and all partner institutions

Institution Name	Year 1 Budget	Year 2 Budget	Year 3 Budget	Year 4 Budget	Total Budget
Total Budget					

** Provide the total costs (\$ in thousands) of the budget request in each year for each institution and totals for all rows and columns.

PROJECT NARRATIVE (FIELD 8 ON THE FORM)

The Project Narrative **must not exceed 40 pages** of technical information, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). The font must not be smaller than Times New Roman 12 point. **Only the first 40 pages of the Project Narrative will be reviewed or considered.** This page limit does not apply to the Cover Page, any Table of Contents (optional, but if included should be limited to one page), Budget Page(s), Budget Justification, biographical material, publications and references, and appendices, each of which may have its own page limit. Headers/footers containing page numbers and project titles/logos may be inserted within the required 1” margins. Do not include any Internet addresses (URLs) that provide supplementary or additional information that constitutes a part of the application. See Part VIII.D, for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The contents of the Project Narrative are specified in order to ensure that the merit reviewers have the necessary information to conduct proper evaluations. All Project Narratives must include the following sections:

I. Introduction and Background This section should place the proposed EFRC in the context of the scientific field in which it would operate by including the following:

- Briefly sketch the background leading to the application, including any preliminary studies that are relevant, critically evaluate existing knowledge, and specifically identify the scientific gaps that the project is intended to fill;
- Clearly state the four-year scientific research goals of the proposed EFRC;
- Include any information that will help to establish the experience and competence of the investigators to pursue the proposed project;
- State concisely the importance of the research described in the application and its potential scientific impact; identify the longer-term impact that the research could have on technologies for environmental management.

II. Proposed Research Applicants must provide detailed information regarding the research proposed for the EFRC. This section should present a closely integrated research program aimed at meeting the four-year scientific goals stated in the Introduction. This section, which may be organized in subtasks, must clearly describe the proposed research by including the following:

- Describe a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational efforts and the development of new capabilities and approaches in these areas; include a statement of the open science questions to be addressed, a detailed research plan, an assessment of the potential scientific impact of the research, and an explanation of how the research plan will attain the four-year scientific goals;
- Explain how success of the proposed research topics *requires* an EFRC approach.
- Describe how the research proposed for the EFRC addresses one or more of the priority research directions identified in the *Basic Research Needs for Environmental Management* workshop report. **Note, however, that research related to contaminant fate and transport in subsurface geological environments is outside the scope of this FOA and should not be included.**
- Describe how the research proposed for the EFRC addresses one or more of the “grand challenges” defined in the report *Directing Matter and Energy: Five Challenges for Science and the Imagination*.
- Describe how the research proposed for the EFRC embodies one or more of the “transformative opportunities” defined in the report *Challenges at the Frontiers of Matter and Energy: Transformative Opportunities for Discovery Science*.
- Describe the role and intellectual contribution of the EFRC Director and all other senior/key personnel on the application;
- Briefly outline the resources available to the proposed EFRC including access to existing research space, instrumentation, computational capabilities, and other facilities both within the EFRC partner institutions and external to the EFRC;
- Describe plans for development and/or utilization of unique facilities, capabilities or approaches to address the scientific goals;

III. EFRC Management Plan This section must provide a clear, substantive overview of the vision, management, and organization of the proposed EFRC by including the following:

- Describe the strategy and plan for developing and operating the EFRC, the means of achieving an integrated research team, and plans for leadership and guidance for the scientific and technical direction of the EFRC;
- Define an organizational structure that delineates the roles and responsibilities of senior/key personnel and describes the means of providing internal and external oversight and guidance for scientific and technical direction of the research program, including but not limited to an advisory committee (required), executive committees, or their equivalent;
- Describe the availability of the EFRC Director and other senior/key personnel, including discussion of their potential involvement in other major projects;
- Discuss the relevant experience of the lead organization, the EFRC Director, and other senior/key personnel in program and personnel management of diverse teams of scientific and technical professionals for projects of comparable complexity and magnitude;

- Define a proposed mechanism by which EFRC leadership will periodically evaluate the success/failure of the various components of the center;
- Define a proposed mechanism by which research thrusts will be reconfigured, including the possibility of ending activities and starting new ones, in response to key scientific challenges, promising developments, or lack of progress;
- Describe the process for making decisions on publications and intellectual property issues.
- If needed, present a well-defined plan to use state-of-the-art technology and frequent virtual meetings to enable meaningful, efficient long distance collaboration;
- Include a brief (less than one page) overview of environmental, safety, and health practices and oversight at each participating institution, including any required permits, licenses, and approvals that must be obtained.

APPENDIX 1: BIOGRAPHICAL SKETCHES

Provide a biographical sketch for the EFRC Director, all Principal Investigator(s), and each additional senior/key person listed in Section A on the R&R Budget form, or proposed as a subawardee or consultant, if they meet the definition of a senior/key person. The designation of multiple Principal Investigators, including Principal Investigators employed by partner institutions, is allowed.

The biographical information (curriculum vitae) for each person should not exceed three pages when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font not smaller than Times New Roman 12 point and must include the following information:

Education and Training: Undergraduate, graduate and postdoctoral training provide institution, major/area, degree, and year.

Research and Professional Experience: Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications: Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities: List no more than five professional and scholarly activities related to the effort proposed.

Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers: Provide the following information in this section:

Collaborators and Co-editors: List in alphabetical order all persons **outside of the** Principal Investigator’s **home institution**, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with the Principal Investigator on a research project, book or book article, report, or paper during the 48 months preceding the

submission of this application. For publications or collaborations with more than 10 authors or participants, only list those individuals in the core group with whom the Principal Investigator interacted on a regular basis while the research was being done. If there are no collaborators to report, state “None.” This information, excluding collaborators from collaborating institutions included in this application, is duplicated in tabular form in Appendix 9.

Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of the Principal Investigator’s graduate advisor(s) and principal postdoctoral sponsor(s). Also, list the names and current organizational affiliations of graduate students and postdoctoral associates that the Principal Investigator has supervised during the past five years.

Advisory Committees. List all advisory committees on which the Principal Investigator serves, including the name of the institution and department.

EFRC Director Statement of Employment: Documentation must be submitted evidencing that the proposed EFRC Director is an employee or will become an employee of the prime applicant upon award of an EFRC. The statement of employment is limited to one page and must be signed by both the EFRC Director and an authorized representative of the lead organization. This document is not included in the three page limit for each biographical sketch.

EFRC Director Individual Commitment Statement: The EFRC Director should provide a signed statement that reflects his/her commitment to this project, including the level of time commitment. This letter of commitment is limited to one page and is not included in the three-page limit for each biographical sketch.

- Provide “BIOGRAPHICAL SKETCHES” as Appendix 1 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 2: CURRENT AND PENDING SUPPORT

Provide individual lists of all current and pending support (both Federal and non-Federal) for the EFRC Director, each of the Principal Investigator s, all additional senior/key personnel, and subawardees, for ongoing projects and pending applications. For each award, indicate whether it is funded or pending, the organization providing the support or from which the funding is requested, the title of the award (and the identification number, if appropriate), the award period, the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to the project by the Principal Investigator or senior/key person. A brief description of how the funded/requested research differs from this application must be included for each entry. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review.

- Provide “CURRENT AND PENDING SUPPORT” as Appendix 2 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the project narrative page limitation.

APPENDIX 3: BIBLIOGRAPHY & REFERENCES CITED

Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. For research areas where there are routinely more than ten coauthors of archival publications, an abbreviated style may be used such as the Physical Review Letters (PRL) convention for citations (listing only the first author). For example, a paper may be listed as, “A Really Important New Result,” A. Aardvark et. al. (MONGO Collaboration), PRL 999. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application.

- Provide “BIBLIOGRAPHY & REFERENCES CITED” as Appendix 3 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 4: FACILITIES, EQUIPMENT, & OTHER RESOURCES

This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. List major items of equipment already available for this project and, if appropriate, identify location and pertinent capabilities. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. For proposed investigations requiring access to experimental user facilities maintained by institutions other than the applicant, please provide a document from the facility manager confirming that the researchers will have access to the facility.

- Provide “FACILITIES, EQUIPMENT, & OTHER RESOURCES” as Appendix 4 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 5: ADDITIONAL FUNDING

Discuss any additional funding and contributions-in-kind for the proposed project, including, but not limited to, optional cost sharing. If there is no additional funding, contributions-in-kind, or cost sharing, state “None.”

- Provide “ADDITIONAL FUNDING” as Appendix 5 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 6: DATA MANAGEMENT PLAN

Provide a Data Management Plan (DMP) that addresses the following requirements:

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.
2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (<http://science.energy.gov/funding-opportunities/digital-data-management/>). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.
3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other Office of Science facilities can be found in the additional guidance from the sponsoring program.
4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, and regulations. There is no requirement to share proprietary data.

DMPs will be reviewed as part of the research proposal merit review process. Applicants are encouraged to consult the Office of Science website for further information and suggestions for how to structure a DMP: <http://science.energy.gov/funding-opportunities/digital-data-management/>

- Provide “DATA MANAGEMENT PLAN” as Appendix 6 to the Project Narrative within the same file. Do not attach a separate file; and
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 7: STATEMENT OF CONFLICT OF INTEREST

At the time of submission, the applicant shall include information identifying potential, apparent, or actual organizational and individual conflicts of interest and proposed mitigation. This shall include the applicant, their team members, and senior/key personnel named in the application. Negative responses are also required. Prior to award, DOE reserves the right to require the submission of a Conflict of Interest Management Plan describing the applicant’s approach to managing conflicts of interest.

- Provide “STATEMENT OF CONFLICT OF INTEREST” as Appendix 7 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 8: ORGANIZATIONAL LETTERS OF COMMITMENT

A single organizational letter of commitment is required from each organization participating as a team member. Each organizational letter of commitment is limited to one page and must be current, signed, and dated by a person authorized to commit the participating organization to a legally binding agreement for this project.

- Provide “ORGANIZATIONAL LETTERS OF COMMITMENT” as Appendix 8 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 9: LIST OF COLLABORATORS

In tabular form following the example below, provide a list of collaborators for all senior/key personnel, including co-authors over the past 48 months, graduate and postdoctoral advisors of the senior/key personnel, graduate students and postdoctoral associates that have been supervised by the senior/key personnel during the past 60 months, and any other current close associations of the senior/key personnel. The table should exclude all personnel at any of the institutions participating in this application.

Collaborator			Institution
Last Name	First Name	Title	Institution Name

** Applicants are strongly encouraged to follow the exact format of the sample table because the tabular information will be compiled across all applications. This includes the following elements:

- Include grid lines around each cell.
- Do not merge name or institution cells, even if individuals share the same institution.
- Do not change the order of the columns.

- Do not include any additional information (e.g. “PI”, “Co-PI”, or footnote symbols) under “Last Name” and “First Name”.
- Do not include departmental affiliations under Institutions.
- If an individual has a joint appointment, separate the institutions with a “/” (i.e. “Univ of X / National Lab Y”).
- Provide “LIST OF COLLABORATORS” as Appendix 9 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

APPENDIX 10: OTHER ATTACHMENT

If you need to elaborate on your responses to questions 1-6 on the “RESEARCH AND RELATED Other Project Information” document, please provide the Other Attachment information as an appendix to your project narrative. Information not easily accessible to a reviewer may be included in this appendix, but do not use this appendix to circumvent the page limitations of the application.

Reviewers will be instructed to ignore any information that appears to be an attempt to circumvent the page limitations of the application.

- Provide “OTHER ATTACHMENT” as Appendix 10 to the project narrative within the same file. Do not attach a separate file.
- This appendix will not count in the Project Narrative page limitation.

Do not attach any of the requested appendices described above as files for fields 9, 10, 11, or 12. Follow the above instructions to include the information as appendices to the project narrative file. These appendices will not count toward the project narrative’s page limitation.

3. Research and Related Budget

Complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (See PART IV, G).

Note: If a DOE/NNSA National Laboratory Contractor is proposed to provide *any* portion of work, the applicant must also provide the information requested in the paragraph entitled “Budget for DOE/NNSA National Laboratory or Contractor” under 4. R&R Subaward Budget Attachment(s) Form.

Budget Fields

<p>Section A Senior/Key Person</p>	<p>For each Senior/Key Person, enter the requested information. List personnel, base salary (annual), the number of months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. The requested salary must be the product of the base salary and the effort. Include a written narrative in the budget justification that justifies the need for requested personnel.</p>
<p>Section B Other Personnel</p>	<p>List personnel, the number of person-months that person will be allocated to the project, requested salary fringe benefits, and the total funds requested for each person. Include a written narrative in the budget justification that fully justifies the need for requested personnel.</p>
<p>Section C Equipment</p>	<p>Equipment is designated as an item of property that has an acquisition cost of \$5,000 or more, as well as lower if the price is consistent with the applicants policy, and an expected service life of more than one year. List each item of equipment separately and justify each in the budget justification section. Do not aggregate items of equipment. Allowable items ordinarily will be limited to research equipment and apparatus not already available for the conduct of the work. General-purpose office equipment is not eligible for support unless primarily or exclusively used in the actual conduct of scientific research. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis).</p>
<p>Section D Travel</p>	<p>Travel to Canada or to Mexico is considered domestic travel. In the budget justification, list each trip's destination, dates, estimated costs including transportation and subsistence, number of staff traveling, the purpose of the travel, and how it relates to the project. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). To qualify for support, attendance at meetings or conferences must enhance the investigator's capability to perform the research, plan extensions of it, or disseminate its results. Domestic travel is to be justified separately from foreign travel.</p>
<p>Section E Participant/Trainee Support Costs</p>	<p>If applicable, submit training support costs. Educational projects that intend to support trainees (precollege, college, graduate and post graduate) must list each trainee cost that includes stipend levels and amounts, cost of tuition for each trainee, cost of any travel (provide the same information as needed under the regular travel category), and costs for any related training expenses. Participant costs are those costs associated with conferences, workshops, symposia or institutes and breakout items should indicate the number of participants, cost for each participant, purpose of the conference, dates and places of meetings and any related administrative expenses. Indicate the basis for the cost estimate (quotes from vendors or suppliers,</p>

	past experience of similar items, or some other basis).
Section F Other Direct Costs	<ul style="list-style-type: none"> • Materials and Supplies: Enter total funds requested for materials and supplies in the appropriate fields. In the budget justification, list general categories such as glassware, and chemicals, including an amount for each category (items not identified under “Equipment”). Categories less than \$1,000 are not required to be itemized. State the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Publication Costs: Enter the total publication funds requested. The application budget may request funds for the costs of documenting, preparing, publishing or otherwise making available to others the findings and products of the work conducted under the award. In the budget justification, include supporting information. State the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Consultant Services: Enter total funds requested for all consultant services. In the budget justification, identify each consultant, the services he/she will perform, total number of days, daily or hourly rate, travel costs, and total estimated costs. State the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • ADP/Computer Services: Enter total funds requested for ADP/Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical and education information may be requested. In the budget justification, include the established computer service rates at the proposing organization if applicable. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Subawards/Consortium/Contractual Costs: Enter total costs for all subawards/consortium organizations and other contractual costs proposed for the project. In the budget justification, justify the details. SEE SECTION 4. • Equipment or Facility Rental/User Fees: Enter total funds requested for Equipment or Facility Rental/User Fees. In the budget justification, identify each rental/user fee and justify. Indicate the basis for the cost estimate (quotes from vendors or suppliers, past experience of similar items, or some other basis). • Alterations and Renovations: Enter total funds requested for Alterations and Renovations. In the budget justification, itemize by category and justify the costs of alterations and renovations, including repairs, painting, removal or installation of partitions, shielding, or air conditioning. Where applicable, provide the square footage and costs. • Other: Add text to describe any other Direct Costs not requested above. Enter costs associated with “Other” item(s). Use the budget justification to further itemize and justify.

Section G Direct Costs	This represents Total Direct Costs (Sections A through F)
Section H Other Indirect Costs	Enter the Indirect Cost information for each field. Only four general categories of indirect costs are allowed/requested on this form, attach a separate sheet if needed. Include the cognizant Federal agency and contact information if using a negotiated rate agreement.
Section I Total Direct and Indirect Costs	This is the total of Sections G and H

BUDGET JUSTIFICATION (FIELD K ON THE FORM)

Provide the required supporting information for the following costs (See R&R Budget instructions): equipment; domestic and foreign travel; participant/trainees; materials and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. **Attach a single budget justification file for the entire project period in field K.** The file automatically carries over to each budget year.

4. R&R Subaward Budget Attachment(s) Form

Budgets for Subawardees:

You must provide a separate R&R budget and budget justification for each subawardee, including but not limited to DOE/NNSA National Laboratory Contractors and non-DOE/NNSA Federal Agencies and their FFRDC Contractors.

Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET FORM and e-mail it to each subawardee that is required to submit a separate budget. After the subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee’s name (plus .pdf) as the file name (e.g., ucla.pdf or energyres.pdf). The budget justification(s) for any subawardee(s) should include the same information supporting each proposed cost that is required of prime awardees in their budget justification, as specified in the table under “Research and Related Budget”, above .

If a subaward is being proposed to a non-DOE/NNSA FFRDC Contractor, the required authorization by the cognizant Contracting Officer for the Federal sponsoring agency, as required in Section III.D. OTHER ELIGIBILITY REQUIREMENTS, should be submitted. Submit this letter as a part of the subawardee budget justification.

Budget for DOE/NNSA National Laboratory Contractor:

If a DOE/NNSA National Laboratory contractor is to perform *any* portion of the work, as the lead organization or as a team member, the DOE/NNSA National Laboratory Contractor should provide with the application:

1. A DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1A, Work Authorization System.

This order and a sample of the DOE Field Work Proposal (FWP) form are available at <https://www.directives.doe.gov/directives/412.1-BOrder-a/view>. For purposes of satisfying this requirement, applicants are required to submit the DOE FWP face and budget pages (pages 1 and 2 of the sample form) with the application as part of the Budget for DOE/NNSA National Laboratory Contractor file. Furthermore, the information requested in blocks 1. through 15. and 17. through 19. of the sample FWP must be furnished with the application. The remainder of the information requested in blocks 16., 20., and 21. of the sample form will be required to be submitted through the DOE Work Authorization System by the successful applicant after selection.

2. The required cognizant Federal Contracting Officer approval authorizing the participation of the DOE/NNSA National Laboratory as described in Section III.D OTHER ELIGIBILITY REQUIREMENTS.

This information is required in addition to the budgetary information requested herein (R&R Budget, R&R Subaward Budget, and Budget Justification, as applicable). Attach this letter as part of the budget justification for applicable prime awardees or subawardees.

5. Project/Performance Site Location(s)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

6. Disclosure of Lobbying Activities (SF-LLL)

If applicable, complete SF-LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit SF-LLL, "Disclosure Form to Report Lobbying".

7. Waiver Request- (a) Foreign Entities and (b) Performance of Work in the United States

As set forth in Section III, all lead organizations receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate in the full application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient. Section III further requires that all work by the lead organization under funding agreements be performed in the United States – i.e., a prime recipient must expend 100% of its total project cost in the United States, except as noted in Section III. D., “*Performance of Work in the United States*”.

To seek a waiver of either requirement, the applicant must submit a waiver request in the full application, which includes the following information: entity name, country (or state) of incorporation, description of the work to be performed by that entity, and the location where the work will be performed. If the applicant is seeking a waiver to have a foreign entity serve as the prime recipient, the applicant must explain why it is necessary to have a foreign entity serve as the prime recipient. If the applicant is seeking a waiver of the “Performance of Work in the United States” requirement, the applicant must explain why it is necessary to have the work performed outside of the United States. All waiver requests should explain how the waiver would further the purposes of this FOA and otherwise serve the interests of DOE. The Contracting Officer may require additional information before considering the waiver request. Attach the waiver request as a part of the budget justification for any prime awardee or subawardee proposing work outside the United States.

8. Summary of Required Forms/Files

Your application must include the following items:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 7
Project Narrative, including required appendices	PDF	Field 8
Cognizant Federal Contracting Officer Approval, if applicable	PDF	Part of budget justification
Waiver Request, if applicable	PDF	Part of budget justification
RESEARCH & RELATED BUDGET	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET ATTACHMENT(S) FORM	Form	N/A
Subawardee Budget Justification	PDF	Field K
PROJECT/PERFORMANCE SITE LOCATION(S)	Form	N/A

SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A
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D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

Environmental Data

E. SUBMISSION DATES AND TIMES

1. Application Due Date

April 19, 2016 at 11:59 PM Eastern Time

You are encouraged to transmit your application well before the deadline.

2. Late Submissions

DOE has only accepted late submissions when applicants have been unable to make timely submissions because of DOE/national technological disruptions or significant natural disasters. Other circumstances do not justify late submissions. Unacceptable justifications include, but are not limited to, the following:

- Failure to begin submission process early enough.
- Failure to provide sufficient time to complete the process.
- Failure to understand the submission process.
- Failure to understand the deadlines for submissions.
- Failure to satisfy prerequisite registrations.
- Unavailability of administrative personnel.

You are responsible for beginning the submission process in sufficient time to accommodate reasonably foreseeable incidents, contingencies, and disruptions.

Applicants must contact the DOE Contact listed in Section VII.B. of this FOA to request acceptance of a late submission.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Funding for all awards and future budget periods is contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in the EFRC award.

Cost Principles: Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

Pre-award Costs: Recipients may charge to an award resulting from this FOA pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation). Recipients must obtain the prior approval of the Contracting Officer for any pre- award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

The LOI must be submitted electronically through the DOE Office of Science Portfolio Analysis and Management System (PAMS) website at <https://pamspublic.science.energy.gov/> in order for applications to be considered for award.

Applications must be submitted through Grants.gov to be considered for award.

Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on Grants.gov.

2. Registration Process

There are several one-time actions you must complete in order to submit an application in response to this FOA. Applicants not currently registered with SAM and Grants.gov should allow **at least 44 days** to complete these requirements. You should start the process as soon as possible.

Applicants must obtain a DUNS number at <http://fedgov.dnb.com/webform>.

Applicants must register with the System for Award Management (SAM) at <http://www.sam.gov/>. If you had an active registration in the Central Contractor Registry, you should have an active registration in SAM. More information about SAM registration for applicants is found at [https://www.sam.gov/sam/transcript/Quick Guide for Grants Registrations v1.7.pdf](https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf).

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in SAM.gov. An applicant's TIN is an Employer Identification Number (EIN) assigned by the Internal Revenue Service (IRS). In limited circumstances, a Social Security Number (SSN) assigned by the Social Security Administration may be used as a TIN. If an SSN is used as a TIN, it will not be treated as Privacy Act data. You may obtain an EIN from the IRS at [http://www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Apply-for-an-Employer-Identification-Number-\(EIN\)-Online](http://www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Apply-for-an-Employer-Identification-Number-(EIN)-Online).

Applicants must register with FedConnect at <http://www.fedconnect.net>. The full, binding version of assistance agreements will be posted to FedConnect.

Recipients must register with the Federal Funding Accountability and Transparency Act Subaward Reporting System at <https://www.frs.gov>. This registration must be completed before an award may be made: you are advised to register while preparing your application.

2. Registering in Grants.gov

For organizations, please follow the procedures detailed below, making use of the checklist provided below:

<http://www.grants.gov/web/grants/applicants/organization-registration.html>
<http://www.grants.gov/documents/19/18243/OrganizationRegChecklist.pdf>

For individuals, please follow the procedures detailed below:

<http://www.grants.gov/web/grants/applicants/individual-registration.html>

Organizations and individuals must have an E-Business (E-Biz) Point of Contact (POC). You may find the checklist at http://www.grants.gov/documents/19/18243/E-Biz_POC_Checklist.pdf useful.

Grants.gov maintains a User Guide at <http://www.grants.gov/documents/19/18243/GrantsGovApplicantUserGuide.pdf> and a list of Frequently Asked Questions at <http://www.grants.gov/web/grants/applicants/applicant-faqs.html>. Questions relating to the registration process, **system requirements, or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

FIRST-TIME REGISTRATION PROCESS IN GRANTS.GOV

You must complete the one-time registration process (all steps) before you can submit your first application through <http://www.grants.gov>. (See <http://www.grants.gov/web/grants/applicants/grant-application-process.html>). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/web/grants/applicants/organization-registration.html> to guide you through the process. **IMPORTANT:** During the SAM registration process, you will be asked to designate an E-Business Point of Contact (E-BIZ POC). The E-BIZ POC must obtain a special password called "Marketing Partner Identification Number". When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

IMPORTANT NOTICE: When you have completed the Grants.gov registration process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

4. Where to Submit an Application

Applications must be submitted through Grants.gov to be considered for award.

Applicants must download the application package, application forms and instructions, from Grants.gov at <http://www.grants.gov/> (Additional instructions are provided in Section IV, A, of this FOA.)

Submit electronic applications through the "Apply for Grants" function at <http://www.grants.gov>. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on Grants.gov.

5. DOE Office of Science Portfolio Analysis and Management System (PAMS)

After you submit your application through Grants.gov, the application will automatically transfer into the PAMS for processing by the DOE Office of Science. Many functions for grants and cooperative agreements can be done in PAMS, which is available at <https://pamspublic.science.energy.gov>.

You will want to “register to” your application: a process of linking yourself to the application after it has been submitted through Grants.gov and processed by DOE.

You must register in PAMS to submit a Letter of Intent.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Notifications sent from the PAMS system will come from the PAMS email address <PAMS.Autoreply@science.doe.gov>. Please make sure your email server/software allows delivery of emails from the PAMS email address to yours.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with (“register to”) your institution. Detailed steps are listed below.

1. CREATE PAMS ACCOUNT:

To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.

- Click the “No, I have never had an account” link and then the “Create Account” button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.
- Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the “Having Trouble Logging In?” page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

2. REGISTER YOUR INSTITUTION:

- Click the link labeled “Option 2: I know my institution and I am here to register to the institution.” (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the “Register to Institution” link.)
- PAMS will take you to the “Register to Institution” page.

- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference **DE-FOA-0001514**.

6. Viewing Submitted Applications

Each Grants.gov application submitted to the DOE Office of Science (SC) automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF424 (R&R) cover page will receive an email with the subject line, “Receipt of Proposal 0000xxxxxx by the DOE Office of Science.” These three people are the Principal Investigator (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the Principal Investigator is known as the PI, the Authorized Representative is known as the Sponsored Research Officer/Business Officer/Administrative Officer (SRO/BO/AO), and the Point of Contact is known as the POC.

There will be a period of time between the application’s receipt at Grants.gov and its assignment to a DOE Office of Science program manager. Program managers are typically assigned two weeks after applications are due at Grants.gov: Please refrain from attempting to view the proposal in PAMS until you receive an email providing the assignment of a program manager.

Once the email is sent, the PI, SRO/BO/AO, and POC will each be able to view the submitted proposal in PAMS. Viewing the proposal is optional.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Following are two sets of instructions for viewing the submitted proposal, one for individuals who already have PAMS accounts and one for those who do not.

If you already have a PAMS account, follow these instructions:

1. Log in to PAMS at <https://pamspublic.science.energy.gov/>.
2. Click the “Proposals” tab and click “Access Previously Submitted Grants.gov Proposal.”
3. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
 - Email (as entered in Grants.gov application): Enter your email address as it appears on the SF424(R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF424 (R&R) cover page. If your name appears in block 19 of the SF424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
4. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

If you do not already have a PAMS account, follow these instructions:

1. To register, click the “Create New PAMS Account” link on the website <https://pamspublic.science.energy.gov/>.
2. Click the “No, I have never had an account” link and then the “Create Account” button.
3. You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the “Save and Continue” button.
4. On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the “Create Account” button.

5. Read the user agreement and click the “Accept” button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
6. You will be taken to the Register to Institution page. Select the link labeled, “Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or POC (Sponsored Research Officer, Principal Investigator, or Point of Contact).”
7. Enter the following information:
 - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeroes (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, “Receipt of Proposal ...”.
 - Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF424 (R&R) Cover Page.
 - Choose Role: Select the radio button in front of the role corresponding to the SF-424 (R&R) cover page. If your name appears in block 19 of the SF424 (R&R) cover page as the authorizing representative, select “SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer).” If your name appears in block 14 of the SF424 R&R cover page as the PI, select “Principal Investigator (PI).” If your name appears in block 5 of the SF424 R&R as the point of contact, select “Other (POC).”
8. Click the “Save and Continue” button. You will be taken to your “My Proposals” page. The Grants.gov proposal will now appear in your list of proposals. Click the “Actions/Views” link in the options column next to this proposal to obtain a dropdown list. Select “Proposal” from the dropdown to see the proposal.

If you were listed as the PI on a prior submission but you have not previously created an account, you may already be listed in PAMS. If this is the case, you will be taken to the PAMS home page after agreeing to the Rules of Behavior. If that happens, follow the instructions listed above under “If you already have a PAMS account...” to access your Grants.gov proposal.

The steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference **DE-FOA-0001514**.

Section V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review in accordance with 10 CFR 605.10(b) to determine that (1) the applicant is eligible for the award; (2) the information required by the FOA has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement. In particular, to be responsive to the objectives of this FOA, the research proposed in the application must address one or more of the challenges described in the *Basic Research Needs for Environmental Management* workshop report. However, research related to contaminant fate and transport in subsurface geological environments is outside the scope of this FOA. Applications with research emphasis in this area of research will be deemed non-responsive to the FOA and will not pass initial review.

Failure to provide any information required by the FOA may cause an application to fail the initial review. DOE reserves the right to contact applicants to request the correction of minor omissions if an application is otherwise responsive to the requirements and objectives of the FOA.

Applications that fail to pass the initial review will not be forwarded for merit review and will be rejected without further review.

2. Merit Review Criteria

Applications will be subjected to scientific merit review (peer review) and will be evaluated by Merit Review Panels against the following seven criteria, the first five of which will be weighted more heavily than the final two (the questions after each are intended to guide the reviewers in understanding the criteria).

SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- How innovative is the proposed research and does it address one or more of the priority research directions described in the *Basic Research Needs for Environmental Management* report? **Note, however, that research related to contaminant fate and transport in subsurface geological environments is outside the scope of this FOA.**
- Does the application contain clearly defined four-year scientific research goals for the EFRC and is the proposed research program likely to meet these goals?
- If successful, what significant impact is the EFRC likely to have on the field of scientific research in which it will be operating? In the longer term, what impact might the EFRC research have on future technologies for environmental management?
- Does the application present a balanced and comprehensive program of basic research that, as needed, supports experimental, theoretical, and computational?

APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- How well do the proposed four-year scientific goals justify the center? Consider, for example, whether the stated goals could be achieved by similar researchers working independently, or whether the research challenges to be addressed are those that are likely to be overcome most efficiently by a centrally managed, well-integrated team.
- Are the strategy and the plan for the development and operation of the proposed EFRC appropriate? Consider, for example, whether the applicants have demonstrated the need for an EFRC approach involving multiple senior/key personnel, the means for achieving an integrated EFRC, and plans for leadership and guidance for the scientific and technical direction.
- Are the proposed scientific methods or approaches detailed in the proposal appropriate to achieve the stated scientific goals of the EFRC?

STRENGTH OF THE EFRC MANAGEMENT PLAN

- Does the applicant present a comprehensive management plan, with a clear lead organization and a qualified and empowered EFRC Director?
- Has the application presented clearly defined mechanisms to evaluate success/failure and to reconfigure research thrusts as needed? Consider, for example, how effectively the applicant will overcome key scientific challenges and shift research directions and resources away from under-productive thrusts and toward promising new directions.
- Does the applicant present an organizational structure that clearly delineates the roles and responsibilities of the EFRC Director and other senior/key personnel, and that describes the means of providing external oversight and guidance for scientific and technical direction of the research program? How will this structure increase the likelihood that the EFRC meets its four-year research goals?
- Is the Data Management Plan suitable for the proposed research, and to what extent does it make the data available and useful to the scientific community?
- Are, workers, environment, the public, safety and health issues responsibly anticipated and addressed or met?

SYNERGY AMONG THE PRINCIPAL INVESTIGATORS, INCLUDING COHESION AND INTEGRATION OF THE RESEARCH ACTIVITIES

- Have the applicants defined scientific problems that are likely to be addressed only through close coordination and collaboration among the researchers on the application?
- To what extent are the elements of the proposed research appropriately integrated and synergistic? Consider, for example, whether the components of the proposed EFRC research represent the necessary elements to achieve the stated goals of the center, or are they simply a collection of loosely connected research projects.
- Is the proposed team of researchers likely to work together in a cohesive and integrated manner?

COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- Do the applicant's senior/key personnel have proven records of research in the disciplines needed for success in this project?
- Do the lead organization and the EFRC Director have proven records of success in program and personnel management of diverse teams of scientific and technical professionals for projects of comparable complexity and magnitude?
- Is the proposed access to existing research space, instrumentation, and experimental and computational facilities at the lead and partner institutions likely to meet the needs of the proposed EFRC? If needed, do the applicants articulate plans for access to research capabilities and resources outside of the EFRC, including national user facilities?
- Will the EFRC Director and senior/key personnel be sufficiently available given their role in the EFRC, taking into account their potential involvement in other major projects?

REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Is the requested operating budget and the distribution of the funds among research tasks/themes and partners reasonable for the planned scientific program? Comment on any budget items that are not well justified or appear anomalous.
- Does the budget include support for the appropriate personnel to carry out the proposed research?
- Are the equipment needs adequately identified, and costs for needed new instrumentation or upgrades realistically estimated?
- Are all subcontracts, travel, student costs and other ancillary expenses adequately estimated and justified?

DEVELOPMENT AND/OR UTILIZATION OF UNIQUE FACILITIES, CAPABILITIES OR APPROACHES

- Does the proposed research rely on the use of unique facilities at the applicants' home institutions or at United States or international user facilities? Describe the strengths and weaknesses of such facilities as they relate to the proposed scientific research.
- Have the applicants proposed the development of facilities, capabilities, or approaches to achieve the stated scientific goals? Comment on the uniqueness of these advances and the impact that they are likely to have on the field of research.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review for eligibility and responsiveness to the FOA will be subjected to formal merit review and will be evaluated based on the criteria stated above in Section V.A.2.

Following completion of the merit review, a team of Federal officials will review the applications and the evaluations of the Merit Review Panels, summarize the Merit Review Panel members' independent evaluations of the applications submitted, and recommend the application of the program policy factors, as appropriate. The evaluation process may include consideration of any of the program policy factors listed in B.2. External peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

2. Selection

The Selection Official will consider the findings of the Merit Review Panels and the recommendations of Federal officials, as well as the following program policy factors:

- Delineation of the scope of the proposed EFRC research from other research activities in which the principal investigators are involved, particularly those supported by DOE and by other federal agencies
- Relevance of the proposed activity to BES priorities
- Ensuring an appropriate balance of activities within BES programs
- Diversity of research activities that will address the scientific grand challenges and use-inspired basic research as articulated in the BESAC and BES workshop reports
- Relationship of the proposed EFRC to other research and development programs in DOE, including but not limited to the Energy Innovation Hubs and the core research activities within the BES Materials Sciences and Engineering Division and Chemical Sciences, Geosciences and Biosciences Division
- Potential for developing synergies between the proposed EFRC and other EFRCs or other ongoing BES research activities

As part of the selection process, DOE reserves the right to seek clarifications in writing from those applications deemed to have the highest scientific merit in order to facilitate the selection process.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE anticipates notifying the applicants selected for award in June 2016 and making awards by August 2016.

Section VI – AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

Selected Applicants Notification: DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Non-selected Notification: Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

If a selected applicant is not a DOE/NNSA National Laboratory Contractor, other Federal Agency, or Non- DOE/NNSA FFRDC Contractor, an Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions; (2) 2 CFR part 200, as amended by 2 CFR part 910, DOE Financial Assistance Regulation, and 10 CFR part 605, the Office of Science Financial Assistance Program; (3) Application as approved by DOE; (4) the Government-wide Research Terms and Conditions, and DOE Agency Specific Requirements; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements; and (8) Intellectual Property Provisions.

For grants and cooperative agreements made to universities, non-profits and other entities subject to 2 CFR 200, awards made under this funding opportunity will include the Government-wide Research Terms and Conditions. A final version of the Terms and Conditions based on the changes to 2 CFR part 200 is not yet available. Once the final Terms and Conditions become available, they will be located at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>. If an award is made under this funding FOA before the final Terms and Conditions are posted, draft Terms and Conditions will be included in the award.

If a selected applicant is a DOE/NNSA National Laboratory Contractor, DOE will fund the DOE/NNSA National Laboratory Contractor through the DOE field work authorization system or other appropriate process. DOE/NNSA National Laboratories Contractors participating as team members of other selected applicants' projects will be funded by field work authorization or other appropriate process.

Non-DOE/NNSA FFRDC Contractors and other Federal agencies, if part of a selected applicant's project, will be funded under an interagency agreement.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR part 200 as amended by 2 CFR part 910, DOE Financial Assistance Regulation, and 10 CFR part 605, the Office of Science Financial Assistance Program, which are available at <http://www.ecfr.gov>. Grants and cooperative agreements made to universities, non-profits and certain other entities are subject to the Research Terms and Conditions located on the National Science Foundation web site at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.

DUNS AND SAM REQUIREMENTS

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: <http://www.ecfr.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov>. SAM is the government-wide system that replaced the Central Contractor Registry (CCR). If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

SUBAWARD AND EXECUTIVE REPORTING

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 are contained in 2 CFR 170. (See: <http://www.ecfr.gov>). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile SAM

PROHIBITION ON LOBBYING ACTIVITY

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 USC 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

2. National Policy Assurances

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://www.nsf.gov/bfa/dias/policy/rtc/appc.pdf> and at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

3. Terms and Conditions

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

The standard DOE financial assistance intellectual property provisions applicable to various types of recipients are located at:

<http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>

4. Additional Conditions

CONFERENCE SPENDING (FEBRUARY 2015)

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed \$20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY REPRESENTATIONS (MARCH 2014)

In submitting an application in response to this FOA the Applicant represents that:

- It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months,
- It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

- A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

PUBLICATIONS

The recipient is expected to publish or otherwise make publicly available the results of the work conducted under any award resulting from this Funding Opportunity Announcement. Publications and other methods of public communication describing any work based on or developed under an award resulting from this Funding Opportunity Announcement must contain

an acknowledgment of DOE Office of Science support. The format for such acknowledgments is provided at <http://science.energy.gov/funding-opportunities/acknowledgements/>. The author's copy of any peer-reviewed manuscript accepted for funding must be announced to DOE's Office of Scientific and Technical Information and made publicly available in accordance with the instructions contained in the Reporting Requirements Checklist incorporated in all Assistance Agreements.

NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS ASSURANCES
(JUNE 2015)

(1) By entering into this agreement, the undersigned attests that the awardee listed in Block 5 of the Assistance Agreement **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(2) The undersigned further attests that the awardee listed in Block 5 of the Assistance Agreement **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

a. *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.”*

b. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

c. Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The checklist is available at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Forms.

Section VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions relating to the Grants.gov registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions. Please contact the Grants.gov help desk only for questions related to grants.gov.

For help with PAMS, click the “External User Guide” link on the PAMS website, <https://pamspublic.science.energy.gov/>. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference **DE-FOA-0001514**.

Please contact the PAMS help desk for technological issues with the PAMS system.

Questions regarding the content of this FOA **must** be submitted through the FedConnect portal. You must register with FedConnect and respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at <https://www.fedconnect.net>.

Due to the time required to provide complete and accurate answers to questions, all questions **must** be submitted through FedConnect no later than **12:00 Noon Eastern Time on March 28, 2016**. DOE will not respond to questions submitted after the designated time.

DOE will try to respond to questions within 3 business days, unless a similar question and answer have already been posted.

B. AGENCY CONTACTS

Grants.gov Customer Support	800-518-4726 (toll-free) support@grants.gov
PAMS Customer Support	855-818-1846 (toll-free) 301-903-9610 sc.pams-helpdesk@science.doe.gov
DOE Contact	Cedric L. Thomas 630-252-4329 cedric.thomas@science.doe.gov

Section VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an FOA message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other FOAs. More information is available at <http://www.fedconnect.net>.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the Government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and the page marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights: The Government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. The Federal Non-Nuclear Energy Act of 1974, 42 USC 5908 provides that title to such inventions vests in the United States, except where 35 USC 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G, below.)

Rights in Technical Data: Normally, the Government has unlimited rights in technical data developed under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Under 42 U.S.C. § 5908, title to subject inventions vests in the United States Government and large businesses and foreign entities do not have the automatic right to elect to retain title to subject inventions. However, applicants may request a waiver of all or any part of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784. For more information, see <http://energy.gov/gc/services/technology-transfer-and-procurement/office-assistant-general-counsel-technology-transf-1>

In accordance with 35 USC 202, domestic small businesses and domestic nonprofit organizations will be subject to the patent rights clause at 2 CFR 910 Appendix A of Subpart D “Patent Rights (Small Business Firms and Nonprofit Organizations)” and 37 CFR 401.14 respectively. These clauses permit domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. PROPERTY

Real property: With respect to the use, management, and disposition of all real property, 2 CFR part 200, as amended by 2 CFR part 910, DOE Financial Assistance Regulation, and 10 CFR part 605, the Office of Science Financial Assistance Program shall be applicable to grants and subawards with institutions of higher education, hospitals, other non-profit organizations, and for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective Management and Operating contract will apply. For non- DOE/NNSA FFRDC contractors and other Federal agencies, the terms and conditions of the interagency agreement will apply.

Personal Property: Federally Owned and Exempt Equipment, and Supplies and Other Expendable Property: With respect to the use, management and disposition of all personal property, 2 CFR part 200, as amended by 2 CFR part 910, DOE Financial Assistance Regulation, and 10 CFR 605, the Office of Science Financial Assistance Program shall be applicable to grants and subawards with institutions of higher education, hospitals, other non-profit organizations, and for-profit organizations. For DOE/NNSA contractors, the terms and conditions of the respective Management and Operating contract will apply. For non-DOE/NNSA FFRDC contractors and other Federal agencies, the terms and condition of the interagency agreement will apply.

J. ENVIRONMENTAL, SAFETY AND HEALTH (ES&H) PERFORMANCE OF WORK AT DOE FACILITIES

With respect to the performance of any portion of the work under this award which is performed at a DOE-owned or controlled site, the recipient agrees to comply with all state and Federal ES&H regulations, and with all other ES&H requirements of the operator of such site. The recipient shall apply this provision to all subawardees at any tier.

K. NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

If the disclosure on the “RESEARCH AND RELATED Other Project Information,” SF424 (R&R), document indicates “Potential Impact – Positive or Negative - on the environment,” or if DOE’s own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare an environmental critique/synopsis per 10 CFR 1021.216. Note that this pre-award environmental critique/synopsis process would be separate from the preparation of a NEPA document such as an environmental impact statement or an environmental assessment, which may occur post-award. If DOE determines it is necessary, this latter process would need to be completed, both funded by and with the participation of the awardee, prior to it taking any action on the proposed project that could have adverse

environmental effect or that could limit the choice of reasonable alternatives.

Note that in most cases, even where potential impact on the environment exists, preparation of an EIS or EA is rarely necessary, but DOE has the expectation that the applicant will disclose the potential on the SF424 (R&R), which would serve to initiate a dialog with DOE. Should the applicant have any uncertainty, they should check “yes.” Such dialog would have no bearing on selection. However, the inability to satisfy the NEPA requirements after an award would result in cancellation of any said award.

L. AVAILABILITY OF FUNDS

Funds are not presently available for this award.

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress.

No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this award and until the awardee receives notice of such availability.