Research Grants Home

Funding Opportunities

Research Areas

Air Research Grants

Climate Change Research Grants

Ecosystems Research Grants

Health Research Grants

Safer Chemicals Research Grants

Sustainability Research Grants

Water Research Grants

Research Grants Events

National Priorities: Transdisciplinary Research into Detecting and Controlling Lead in Drinking Water

U.S. Environmental Protection Agency
Office of Research and Development
National Center for Environmental Research

National Priorities: Transdisciplinary Research into Detecting and Controlling Lead in Drinking Water

This is the initial announcement of this funding opportunity.

Funding Opportunity Number: EPA-G2017-ORD-F1

Catalog of Federal Domestic Assistance (CFDA) Number: 66.511

Solicitation Opening Date: June 27, 2017
Solicitation Closing Date: August 15, 2017, 11:59:59 pm Eastern Time

Technical Contact: Michael Hiscock (hiscock.michael@epa.gov); phone: 202-564-4453
Eligibility Contact: Ron Josephson (josephson.ron@epa.gov); phone: 202-564-7823
Electronic Submissions: Debra M. Jones (jones.debram@epa.gov); phone: 202-564-7839

Table of Contents:

SUMMARY OF PROGRAM REQUIREMENTS

- Synopsis of Program
- Award Information

	Eligibility Information
	Application Materials
	Agency Contacts
I. FUNDING OPPORTUNITY DESCRIPTION	
	A. Introduction
	B. Background
	C. Authority and Regulations
	D. Specific Areas of Interest/Expected Outputs and Outcomes
	E. References
	F. Special Requirements
II. AWARD INFORMATION	
III. ELIGIBILITY INFORMATION	
	A. Eligible Applicants
	B. Cost Sharing
	C. Other
IV. APPLICATION AND SUBMISSION INFORMATION	
	A. Grants.gov Submittal Requirements and Limited Exception Procedures
	B. Application Package Information
	C. Content and Form of Application Submission
	D. Submission Dates and Times
	E. Funding Restrictions
	F. Submission Instructions and Other Submission Requirements
V. APPLICATION REVIEW INFORMATION	
	A. Peer Review
	B. Programmatic Review
	C. Human Subjects Research Statement (HSRS) Review
	D. Funding Decisions

	E. Additional Provisions for Applicants Incorporated into the Solicitation
VI. AWARD ADMINISTRATION INFORMATION	
	A. Award Notices
	B. Disputes
	C. Administrative and National Policy Requirements
VII. AGENCY CONTACTS	

Access Standard Forms (How to Apply and Required Forms)
View research awarded under previous solicitations (Research Grant Areas)

SUMMARY OF PROGRAM REQUIREMENTS

Synopsis of Program:
The U.S. Environmental Protection Agency (EPA) is seeking applications proposing to (1) identify communities that are at a high risk of experiencing the adverse health effects of lead in drinking water; (2) identify opportunities to mitigate these risks; and (3) conduct educational and outreach efforts so that water system managers and the general public are aware of these risks and opportunities.

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for pregnant women and fetuses, nursing women, and children at subparts B, C, and D. Research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women, and children. Research meeting the regulatory definition of observational research found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). All applications must include a Human Subjects Research Statement (HSRS, as described in Section IV.C.5.c of this solicitation), and if the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.C and V.D of this solicitation.

Guidance and training for investigators conducting EPA-funded research involving human subjects may be obtained here:
Basic Information about Human Subjects Research
Basic EPA Policy for Protection of Subjects in Human Research Conducted or Supported by EPA

Award Information:
Anticipated Type of Award: Grant or Cooperative Agreement
Estimated Number of Awards: Approximately 2 awards
Anticipated Funding Amount: Approximately $3,963,000 total in federal funds for all awards
Potential Funding per Grant: Up to a total of $1,981,500 in federal funds,

including direct and indirect costs, with a maximum duration of 3 years. **Each applicant must contribute a minimum 25 percent match that may include in-kind contributions (see Section III.B. for more detail).**

Cost-sharing is required. Proposals with budgets including a federal contribution exceeding the total maximum federal award limit of $1,981,500 will not be considered. Each applicant must contribute a minimum 25% non-federal match. The maximum award, based on a 25% non-federal match, is $1,981,500 EPA funds + $495,375 for a total of $2,476,875. Including matching, projects can exceed $2,476,875 (if the applicant proposes more than the minimum required non-federal match), however the federally funded portion of the budget must not exceed $1,981,500. In order to be eligible for funding consideration, applicants must demonstrate in their application how they will meet the required minimum 25% match in accordance with 2 CFR §200.306.

Eligibility Information:
Nonprofit organizations and public and private universities and colleges located in the United States are eligible. Foreign entities, States, including the District of Columbia and State and local government departments, territories, possessions, and Tribal nations of the U.S., are not eligible to apply under this RFA. Profit-making firms are not eligible to receive assistance agreements from EPA under this program. See full announcement for more details.

Application Materials:
To apply under this solicitation, use the application package available at Grants.gov (for further submission information see Section IV.F. “Submission Instructions and other Submission Requirements”). Note: With the exception of the current and pending support form (available at Research Funding Opportunities: How to Apply and Required Forms), all necessary forms are included in the electronic application package. Make sure to include the current and pending support form in your Grants.gov submission.

If your organization is not currently registered with Grants.gov, you need to allow approximately one month to complete the registration process. Please note that the registration process also requires that your organization have a unique entity identifier (formerly ‘DUNS number’) and a current registration with the System for Award Management (SAM) and the process of obtaining both could take a month or more. Applicants must ensure that all registration requirements are met in order to apply for this opportunity through Grants.gov and should ensure that all such requirements have been met well in advance of the submission deadline. This registration, and electronic submission of your application, must be performed by an authorized representative of your organization.

If you do not have the technical capability to utilize the Grants.gov application submission process for this solicitation, see Section IV.A below for additional guidance and instructions.

Agency Contacts:
Technical Contact: Michael Hiscock (hiscock.michael@epa.gov); phone: 202-564-4453
Eligibility Contact: Ron Josephson (josephson.ron@epa.gov); phone: 202-564-7823
Electronic Submissions: Debra M. Jones (jones.debram@epa.gov); phone: 202-564-7839

I. FUNDING OPPORTUNITY DESCRIPTION

A. Introduction

One of the high-priority research areas identified by the EPA Office of Research and Development (ORD) is drinking water. Under the Safe Drinking Water Act (SDWA), the responsibility for making sure public water systems provide safe drinking water is divided among the EPA, states, tribal nations, and water systems. EPA is issuing this call for research to foster projects to (1) identify communities that are at a high risk of experiencing the adverse health effects of lead in drinking water; (2) identify opportunities to mitigate these risks; and (3) conduct educational and outreach efforts so that water system managers and the general public are aware of these risks and opportunities.

The EPA currently supports a number of drinking water-related research grants resulting from previous solicitations. Information regarding current research can be found on EPA's Research Grants website.

EPA recognizes that it is important to engage all available minds to address the environmental challenges the nation faces. At the same time, EPA seeks to expand the environmental conversation by including members of communities which may have not previously participated in such dialogues to participate in EPA programs. For this reason, EPA strongly encourages all eligible applicants identified in Section III, including minority serving institutions (MSIs), to apply under this opportunity.

For purposes of this solicitation, the following are considered MSIs:

1. Historically Black Colleges and Universities, as defined by the Higher Education Act (20 U.S.C. § 1061). A list of these schools can be found at White House Initiative on Historically Black Colleges and Universities;
2. Tribal Colleges and Universities, as defined by the Higher Education Act (20 U.S.C. § 1059(c)). A list of these schools can be found at American Indian Tribally Controlled Colleges and Universities;
3. Hispanic-Serving Institutions (HSIs), as defined by the Higher Education Act (20 U.S.C. § 1101a(a)(5)). There is no list of HSIs. HSIs are institutions of higher education that, at the time of application submittal, have an enrollment of undergraduate full-time equivalent students that is at least 25% Hispanic students at the end of the award year immediately preceding the date of application for this grant; and
4. Asian American and Native American Pacific Islander-Serving Institutions; (AANAPISIs), as defined by the Higher Education Act (20 U.S.C. § 1059g(a)(2)). There is no list of AANAPISIs. AANAPISIs are institutions of higher education that, at the time of application submittal, have an enrollment of undergraduate students that is not less than 10 % students who are Asian American or Native American Pacific Islander.

B. Background

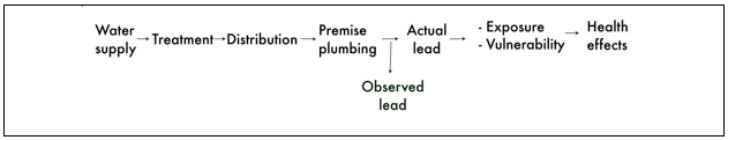
The events leading to elevated blood lead levels (BLL) among children in Flint, Michigan are well established. In 2014, the city government switched from Detroit's water source to the Flint River. At the time of the switch in sources, the city discontinued corrosion control and allowed changes in other key water quality parameters to occur that aggravated corrosion within the many lead pipes in the city's distribution system, triggering increases in water lead levels (WLL) (1).

The events in the Flint, MI area are unique, but there are many other communities across the U.S. facing challenges in effectively managing lead and copper in their drinking water systems. Analysis of data in EPA's Safe Drinking Water Information System indicates that in the past four

years, 2,000 water systems across all 50 states exceeded regulatory action levels of 15 parts per billion (2). Collectively, these systems supply water to 6 million people; 350 of them provide water to schools or day care centers. The greatest number of water systems exceeding regulatory action levels has been observed in California, New York, New Jersey, Texas, Pennsylvania, North Carolina, Florida, Massachusetts, Maine, and New Hampshire (2).

To better understand lead exposure issues and address lead problems, EPA is issuing this Request for Applications (RFA) to spur innovative research into detecting and controlling lead (Pb) in drinking water. This RFA calls for transdisciplinary research across an entire continuum: from lead's occurrence in a community's water supply, treatment and distribution, through the effect of lead on public health.

The following schematic is intended to help interested applicants navigate their way through the various components of this continuum. However, applicants should view these components as an integrated whole, rather than distinct topics to be considered in a linear manner. Anticipating and avoiding Pb's adverse health effects is challenging because Pb's transport and fate—when flowing through a community's water system and when consumed by that community—can proceed along multiple pathways, depending on numerous factors.



Health effects

To appreciate the importance of this research, consider Pb's health effects, which have been widely studied for many years. Pb exposure has been linked to anemia, renal dysfunction, impaired hearing and post-natal growth, and neurotoxic effects. Pooled cohort studies have linked intellectual deficit among young children to BLL, with no apparent threshold (3). The most common risk of harm among children is impairment of neurodevelopment, with measurable effects on cognitive and behavioral outcomes. The best-established measure of neurologic deficit associated with early lead exposure is reduced cognitive performance as measured on standardized tests of general intellectual ability, or IQ. Differences in IQ associated with low to-moderate levels of lead exposure are generally small and difficult to detect. However, when aggregated across millions of individuals, even small differences in IQ have a major impact.

Cognitive ability affects school performance, educational attainment, and success in the labor market. It is therefore positively associated with earnings. In a widely cited paper, Grosse et al. estimated that the discounted earnings of a two-year old impaired by elevated blood levels was $723,300 in 2000 dollars (4). Based on this work, another researcher estimated that this amounted to $19 billion to $21.5 billion in lost earnings nationally (5).

Exposure and vulnerability

BLL is the primary biomarker used to monitor exposure to Pb (6). Since the ban on leaded gasoline, residential sources—such as dust, paint and Pb from tap water—have been the biggest source of BLL for children in developed countries (7). Pb in drinking water has been estimated to

account for 20% or more of total lead exposure nationally (7). Isolated cases reported in North Carolina, Maine, and DC, have demonstrated that lead in drinking water can be a major contributor to BLL (8).

However, exposure from drinking water is only one contributor to health risk from lead exposure. A community may be exposed to Pb in drinking water, but overall health effects from Pb will also depend on Pb exposure from other sources such as soil and lead-based paint. *This wide variability in people's exposure and vulnerability to Pb is a major obstacle (1) to researchers' understanding of the relationship among WLL, BLL and public health; and (2) to society's ability to anticipate threats from WLL.*

Variability in exposure and vulnerability to actual Pb

Infrastructure differences and water consumption patterns significantly influence WLL across different water systems and even across different households within the same system. Throughout the entire distribution system, WLL vary with chemical and biological changes caused by differences in water line conditions, in water use patterns, and in treatment methods (9).

Socio-demographic factors also seem to influence exposure to elevated WLL. In Flint, for example, higher BLL were observed in children who suffered poor nutrition and who lived in older housing stock in neighborhoods with high poverty and vacancy rates (1). Moreover, studies have indicated that Pb concentration in tap-water varies with water temperature. Ngueta et al. have observed marked differences between summer and winter WLL, suggesting that WLL is subject to weather variability (10). The influence of temperature on WLL becomes more pronounced in the presence of natural organic matter (11).

In addition to the different ways in which they are exposed to Pb, people respond variously to the chemical depending on their age *(children absorb 40-50% of an oral dose of water-soluble lead, versus 3-10% for adults (12))*, diet, and genetic predisposition (8).

A cohort that appears to be at greatest risk are infants who rely on reconstituted formula because they are the most vulnerable to Pb in drinking water. Among infants drinking formula made from tap water at 10 ppb Pb, about 25% show a BLL above the Centers for Disease Control and Prevention (CDC) reference level of 5 micrograms per deciliter (µg/dL) (1). A known abortifacient, lead has also been implicated in increased fetal deaths and reduced birth weights (1).

Observation error in measuring Pb

Given the numerous factors driving WLL variability, obtaining representative water samples to characterize cumulative Pb exposure is a challenge. Several researchers suggest that existing sampling and analytical protocols can miss a high percentage of total Pb in a household's tap water. It has been shown that a single sample during an environmental assessment can show that water is below the lead action level when other samples collected from the same tap at other times can indicate concentrations far above the lead action level (9).

One sampling artifact that can affect Pb measurement is flow rate. Some studies suggest that higher flow rates can detach lead or copper particles from premise plumbing; other studies suggest that this detachment of particles occurs randomly. This is significant because even as corrosion control has focused on reducing soluble Pb, studies indicate that Pb in

many distribution systems exists in particulate form. These particles have been shown to dissolve in gastric acid, thereby making them bioavailable. Therefore, sampling protocols that miss lead particles that have been released in the distribution system may lead to an underestimation of actual health risks posed by WLL (9).

Sources of lead in drinking water

Unlike most drinking water contaminants, lead is rarely found in the source water used for public water supplies. Instead, lead enters tap water as a result of the corrosion that takes place over time when materials containing lead in the water distribution system or household plumbing come into contact with water. For example, lead can leach out of service lines, pipes, brass and bronze fixtures, solders, or other lead materials, and contaminate drinking water.

This is especially true for older plumbing systems that were installed before lead free plumbing was required in 1986 (17). To glean the potential scale of the risk of Pb in drinking water, consider that an estimated 22% of the pipes in the United States are more than 50 years old; the average age of pipe at failure is 47 years, and only 43% of pipes are considered to be in good or excellent condition (13).

For water systems using groundwater (e.g. springs and wells), the source water can significantly affect the presence of Pb in drinking water. The chemical quality of drinking water sourced from groundwater is known to vary spatially as a result of: variations in aquifer geology and chemistry; treatment works method(s); and reaction between the water and distribution and/or plumbing systems. Spatial differences in groundwater chemistry vary over a scale determined by factors including the aquifer extent and heterogeneity, groundwater flow paths and residence times, and the intensity of external inputs, such as anthropogenic contaminants (14). Source water quality can also be an issue for private wells using groundwater. Approximately 15% of U.S. households, serving more than 47 million residents, rely on private wells (15). A recent survey of over 2000 private wells in Virginia indicated that only 5% of systems had installed acid neutralizers that adjusted water chemistry to control lead release and 3% had reserve osmosis units that removed lead through membranes, despite the fact that source water (e.g., groundwater) can be extremely corrosive toward metals (15).

Whether a water system is public or private, water treatment and disinfection practices can undermine Pb corrosion control. For example, to rid its waters of coliform bacteria, the District of Columbia (DC) in the 1990s applied high levels of chlorine, altering the structure of Pb minerals coating its water lines. This altered structure increased the solubility of Pb at the pH levels of DC's drinking water (16). Moreover, in DC during the 2000s and in North Carolina, using chloramines for disinfection was correlated with higher WLL and BLL (16).

The specific Strategic Goal and Objective from the EPA's Strategic Plan that relate to this solicitation are:

Goal 2: Protecting America's Waters, Objective 2.1: Protect Human Health

The EPA's FY 2014-18 Strategic Plan can be found at: EPA Strategic Plan

C. Authority and Regulations

The authority for this RFA and resulting awards is contained in the Safe Drinking Water Act, 42 U.S.C. 300j-1, Section 1442 and the Consolidated

Appropriations Act, 2017, P.L. 115-31.

For research with an international aspect, the above statutes are supplemented, as appropriate, by the National Environmental Policy Act, Section 102(2)(F).

Note that a project's focus is to consist of activities within the statutory terms of EPA's financial assistance authorities; specifically, the statute(s) listed above. Generally, a project must address the causes, effects, extent, prevention, reduction, and elimination of air pollution, water pollution, solid/hazardous waste pollution, toxic substances control, or pesticide control depending on which statute(s) is listed above. Further note applications dealing with any aspect of or related to hydraulic fracking will not be funded by EPA through this program.

Additional applicable regulations include: 2 CFR Part 200, 2 CFR Part 1500, and 40 CFR Part 40 (Research and Demonstration Grants).

D. Specific Areas of Interest/Expected Outputs and Outcomes
Note to applicant: The term "output" means an environmental activity, effort, and/or associated work products related to an environmental goal or objective, that will be produced or provided over a period of time or by a specified date. The term "outcome" means the result, effect or consequence that will occur from carrying out an environmental program or activity that is related to an environmental or programmatic goal or objective.

EPA is interested in proposals that incorporate all of the following research needs. Note that the research should be national in scope; it should also focus on water quality (by looking at the impact of lead in drinking water) and water quantity (to the extent that improving water quality increases the amount of safe drinking water available to the public).

- ***Develop sampling protocols, collect data and develop computational models to identify communities that are at a high risk of experiencing the adverse health effects of lead in drinking water.***
  - Projects should generate, collect, and manage data to help identify all U.S. communities that are at a high risk of experiencing the adverse health effects of lead in drinking water. These data should be national in scope and gathered from monitors and publicly available data.
  - Data should be based on sampling protocols that are adequate to capture the variability affecting the exposure and vulnerability of communities to lead in drinking water. The sampling protocols should consider, but do not need to be restricted to, EPA's prescribed procedures as to sample site location, collection method and as otherwise codified in 40 CFR Part 141. If the grantee recommends a different set of protocols because it will provide a better estimate of lead levels in drinking water, the grantee should explain his or her basis for recommending a different set of protocols. Also, attention should be paid to the fact that different forms of lead may require different sampling procedures (e.g. particulate versus dissolved forms of lead). Sampling should provide an improved understanding of real exposure to Pb from a variety of water qualities (e.g. pH, alkalinities, systems with treatment already in place) and settings (e.g. single family residences, apartment buildings, etc.)
  - These data should be used to develop models that allow any community to identify areas in the distribution system and premise plumbing with high Pb concentrations, test scenarios that might lead to Pb release (e.g. change in disinfection methods), and identify high

priority areas for mitigating lead release through pipe replacement. The model(s) should incorporate and account for community-specific variability in factors influencing the exposure and vulnerability of communities to lead in drinking water conveyed through distribution systems and premise plumbing. This research should account for variety in household water use and for attributes of at-risk populations (e.g. infants, pregnant women) and should account for water consumption outside homes (e.g. schools, food service establishments, workplaces). The research should also include national-scale data and analysis of current and state-of-the-art corrosion control strategies utilized by drinking water treatment plants in the U.S.
    - Data should be maintained in open, machine-readable format such as XML. They should be described by metadata so that any secondary user will understand the data sources, consistent with the best practices articulated by EPA's data quality guidelines (see Guidance for Data Quality Assessment (PDF) (219 pp, 1.22 MB)). These data should be as comprehensive as possible including data from community water systems, non-transient non-community water systems (e.g. schools, factories, hospitals), transient non-community water systems (e.g. gas stations, campgrounds), and private wells/systems.
    - Models should be non-proprietary, open-source, and accessible in a programming language, such as Python, C++, or R. Adaptation of existing models may also be included.
    - Because projects should be national in scope, analytical techniques should be used so that data and models can be scaled up to the national level and scaled down to local levels.
- ***Identify opportunities to mitigate risks.*** Projects should identify opportunities to intervene in communities that are at a high risk of experiencing the adverse effects of lead in drinking water. When identifying these intervention opportunities, the research should describe the economic feasibility of interventions, including the cost of intervention as well as communities' willingness to pay for such interventions. The research should also evaluate the costs versus the benefits of interventions, including the benefits associated with risks avoided. As part of the cost/benefit analyses, the research should also include an evaluation of how costs/benefits of remediation of drinking water sources compare against mitigation of risks during treatment and post-treatment. Interventions can include (but are not limited to): infrastructure replacement (including both lead or galvanized service line replacement and replacement of leaded or galvanized premise plumbing materials), improved corrosion control, and point-of-use/point-of-entry (POU/POE) treatment.
- ***Conduct educational and outreach efforts on risk factors and opportunities to mitigate those risks.***
    - The project should foster interaction among researchers, technology developers, end-users, and other stakeholders. It should provide education, training and technical assistance to the general public and should encourage collaboration with local, regional (multi-state), and national organizations that are seeking to improve water infrastructure and to enhance public health.
    - These outreach and educational efforts should be mediated by social media tools in order to maximize access from and engagement with the general public.

The research performed under this RFA should be conducted across multiple disciplines, investigating the engineering aspects that generate lead in drinking water (e.g. the contributions of water supplies, treatment, distribution systems, and household plumbing). The research should also

investigate socio-economic factors, to the extent that they influence the exposure and vulnerability to lead in drinking water. The research should integrate multiple disciplines, investigating how engineering and technological choices might be influenced by socio-economic factors, thereby leading to variability across communities, in terms of exposure and vulnerability to lead in drinking water. The research should also investigate how these factors influence public health, with a focus on identifying vulnerable cohorts and communities.

Proposals which do not address all of the research needs above and are not national in scope may not be rated as highly under the evaluation process described in Section V.

In addition to the research areas listed above, EPA encourages:

- research to estimate the risks of lead in drinking water from private water systems and wells;
- research to estimate risks from lead in drinking water in consecutive systems (i.e. buildings or systems that re-treat municipal drinking water on-site);
- and, research establishing partnerships and collaborations with communities that are most vulnerable and most exposed to lead in drinking water.

Expected outputs of the awards under this RFA include collections of data and analytical models that help communities predict, identify, and remediate the risks associated with lead in drinking water. Expected outcomes include improved understanding of data sampling protocols and of the factors influencing how different communities are exposed to and are vulnerable to lead in drinking water.

To the extent practicable, research proposals must embody innovation and sustainability. Innovation for the purposes of this RFA is defined as the process of making changes; a new method, custom or device. Innovative research can take the form of wholly new applications or applications that build on existing knowledge and approaches for new uses. Research proposals must include a discussion on how the proposed research is innovative (see Section IV.C.5.a). The goal of sustainability, derived from the U.S. National Environmental Policy Act of 1969 (NEPA), is to, “create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations.” Research proposals must include a discussion on how the proposed research will seek sustainable solutions that protect the environment and strengthen our communities (see Section IV.C.5.a). ORD will draw from all of the above-mentioned innovation and sustainability definitions in the review/evaluation process of recommending research proposals (see Section V.A).

E. References
[Journals]

1. M. Hanna-Attisha, J. LaChance, R. C. Sadler, A. Champney Schnepp, Elevated blood lead levels in children associated with the Flint drinking water crisis: a spatial analysis of risk and public health response. *American journal of public health*, e1-e8 (2016).
2. EPA's Safe Drinking Water Information System Federal Reporting Services.
3. G. Ngueta, B. Abdous, R. Tardif, J. St-Laurent, P. Levallois, Use of a cumulative exposure index to estimate the impact of tap-water lead concentration on blood lead levels in 1-to 5-year-old children (Montreal,

Canada). *Environ Health Perspect*, (2015).
4. S. D. Grosse, T. D. Matte, J. Schwartz, R. J. Jackson, Economic gains resulting from the reduction in children's exposure to lead in the United States. *Environmental Health Perspectives* 110, 563 (2002).
5. E. Gould, Children's lead poisoning and asthma. *Econ Policy Inst Working Paper* **9**, (2005).
6. L. M. Pfadenhauer, J. Burns, A. Rohwer, E. A. Rehfuess, Effectiveness of interventions to reduce exposure to lead through consumer products and drinking water: A systematic review. *Environmental Research* **147**, 525-536 (2016).
7. A. Etchevers *et al.*, Environmental determinants of different blood lead levels in children: A quantile analysis from a nationwide survey. *Environment international* **74**, 152-159 (2015).
8. S. Triantafyllidou, M. Edwards, Lead (Pb) in tap water and in blood: implications for lead exposure in the United States. *Critical Reviews in Environmental Science and Technology* **42**, 1297-1352 (2012).
9. S. Masters, J. Parks, A. Atassi, M. A. Edwards, Inherent variability in lead and copper collected during standardized sampling. *Environmental monitoring and assessment* **188**, 1-15 (2016).
10. Ngueta et al (2015).
11. S. Masters, G. J. Welter, M. A. Edwards, Seasonal Variations in Lead Release to Potable Water. *Environmental Science & Technology*, (2016).
12. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, August 2007. Toxicological Profile for Lead.
13. F. Rosario-Ortiz, J. Rose, V. Speight, U. Von Gunten, J. Schnoor, How do you like your tap water? *Science* **351**, 912-914 (2016).
14. E. Ander *et al.*, Variability in the chemistry of private drinking water supplies and the impact of domestic treatment systems on water quality. *Environmental geochemistry and health*, 1-20 (2016).
15. K. J. Pieper, L.-A. Krometis, D. Gallagher, B. Benham, M. Edwards, Profiling Private Water Systems to Identify Patterns of Waterborne Lead Exposure. *Environmental science & technology* **49**, 12697-12704 (2015).
16. M. J. Brown, S. Margolis, *Lead in drinking water and human blood lead levels in the United States.* (US Department of Health and Human Services, Centers for Disease Control and Prevention, 2012).
17. 42 U.S.C. sec. 300g-6, Prohibition on use of lead pipes, solder, and flux.

F. Special Requirements

Agency policy and ethical considerations prevent EPA technical staff and managers from providing applicants with information that may create an unfair competitive advantage. Consequently, EPA employees will not review, comment, advise, and/or provide technical assistance to applicants preparing applications in response to EPA RFAs. EPA employees cannot endorse any particular application.

Multiple Investigator applications may be submitted as: (1) a single Lead Principal Investigator (PI) application with Co-PI(s) or (2) a Multiple PI application (with a single Contact PI). If you choose to submit a Multiple PI application, you must follow the specific instructions provided in Sections IV. and V. of this RFA. For further information, please see the EPA Implementation Plan for Policy on Multiple Principal Investigators (RBM Toolkit - Research Business Models Working Group).

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. All applications

must include a Human Subjects Research Statement (HSRS; described in Section IV.C.5.c of this solicitation). If the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.C and V.D of this solicitation.

Groups of two or more eligible applicants may choose to form a consortium and submit a single application for this assistance agreement. The application must identify which organization will be the recipient of the assistance agreement and which organizations(s) will be subawardees of the recipient.

The application should include a plan (see “Data Plan” in section IV.C.5.d) to make available to the NCER project officer all data generated (produced under the award) from observations, analyses, or model development used under an agreement awarded from this RFA. The data must be available in a format and with documentation such that they may be used by others in the scientific community.

These awards may involve the collection of “Geospatial Information,” which includes information that identifies the geographic location and characteristics of natural or constructed features or boundaries on the Earth or applications, tools, and hardware associated with the generation, maintenance, or distribution of such information. This information may be derived from, among other things, a Geographic Positioning System (GPS), remote sensing, mapping, charting, and surveying technologies, or statistical data.

II. AWARD INFORMATION

It is anticipated that a total of approximately $3,963,000 in federal funds will be awarded under this announcement, depending on the availability of funds, quality of applications received, and other applicable considerations. The EPA anticipates funding approximately 2 awards under this RFA. Requests for amounts in excess of a total of $1,981,500 in federal funds, including direct and indirect costs, will not be considered. In addition, a minimum 25% non-federal match, which may include in-kind contributions (see Section III.B. for more details) equal to a minimum of $495,375 (assuming the applicant requests $1,981,500 in EPA funds) must be included. Applications which do not demonstrate how the minimum 25% non-federal match will be met will not be considered. The total project period requested in an application submitted for this RFA may not exceed 3 years.

The EPA reserves the right to reject all applications and make no awards, or make fewer awards than anticipated, under this RFA. The EPA reserves the right to make additional awards under this announcement, consistent with Agency policy, if additional funding becomes available after the original selections are made. Any additional selections for awards will be made no later than six months after the original selection decisions.

In appropriate circumstances, EPA reserves the right to partially fund proposals/applications by funding discrete portions or phases of proposed projects. If EPA decides to partially fund a proposal/application, it will do so in a manner that does not prejudice any applicants or affect the basis upon which the proposal/application, or portion thereof, was evaluated and selected for award, and therefore maintains the integrity of the competition and selection process.

EPA may award both grants and cooperative agreements under this

announcement.

Under a grant, EPA scientists and engineers are not permitted to be substantially involved in the execution of the research. However, EPA encourages interaction between its own laboratory scientists and grant Principal Investigators after the award of an EPA grant for the sole purpose of exchanging information in research areas of common interest that may add value to their respective research activities. This interaction must be incidental to achieving the goals of the research under a grant. Interaction that is “incidental” does not involve resource commitments.

Where appropriate, based on consideration of the nature of the proposed project relative to the EPA’s intramural research program and available resources, the EPA may award cooperative agreements under this announcement. When addressing a research question/problem of common interest, collaborations between EPA scientists and the institution’s principal investigators are permitted under a cooperative agreement. These collaborations may include data and information exchange, providing technical input to experimental design and theoretical development, coordinating extramural research with in-house activities, the refinement of valuation endpoints, and joint authorship of journal articles on these activities. **Proposals may not identify EPA cooperators or interactions; specific interactions between EPA’s investigators and those of the prospective recipient for cooperative agreements will be negotiated at the time of award.**

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

This solicitation is available to nonprofit organizations and public and private universities and colleges located in the United States. Foreign entities, States, including the District of Columbia and State and local government departments, territories, possessions, and Tribal nations of the U.S., are not eligible to apply under this RFA. Profit-making firms are not eligible to receive assistance agreements from the EPA under this program.

Non-profit organization, as defined by 2 CFR Part 200, means any corporation, trust, association, cooperative or other organization that: (1) is operated primarily for scientific, educational, service, charitable or similar purposes in the public interest; (2) is not organized primarily for profit; and (3) uses its net proceeds to maintain, improve and/or expand its operations. While not considered to be a “non-profit organization(s)” as defined by 2 CFR Part 200, Institutions of Higher Education are, nevertheless, eligible to submit applications under this RFA. Hospitals that meet the definition of nonprofit at 2 CFR 200.70 are also eligible to apply. For-profit colleges, universities, trade schools, and hospitals are ineligible. Nonprofit organizations described in Section 501(c) (4) of the Internal Revenue Code that lobby are not eligible to apply.

National laboratories funded by Federal Agencies (Federally-Funded Research and Development Centers, "FFRDCs") may not apply. FFRDC employees may cooperate or collaborate with eligible applicants within the limits imposed by applicable legislation and regulations. They may participate in planning, conducting, and analyzing the research directed by the applicant, but may not direct projects on behalf of the applicant organization. The institution, organization, or governance receiving the award may provide funds through its assistance agreement from the EPA to an FFRDC for research personnel, supplies, equipment, and other expenses directly related to the research. However, salaries for permanent

FFRDC employees may not be provided through this mechanism.

Federal Agencies may not apply. Federal employees are not eligible to serve in a principal leadership role on an assistance agreement, and may not receive salaries or augment their Agency's appropriations in other ways through awards made under this program.

The applicant institution may enter into an agreement with a Federal Agency to purchase or utilize unique supplies or services unavailable in the private sector to the extent authorized by law. Examples are purchase of satellite data, chemical reference standards, analyses, or use of instrumentation or other facilities not available elsewhere. A written justification for federal involvement must be included in the application. In addition, an appropriate form of assurance that documents the commitment, such as a letter of intent from the Federal Agency involved, should be included.

Potential applicants who are uncertain of their eligibility should contact Ron Josephson (josephson.ron@epa.gov) in NCER, phone: 202-564-7823.

B. Cost sharing

Each applicant must contribute a minimum 25% non-federal cost share/match which may include in-kind contributions. In order to be eligible for funding consideration, applicants must demonstrate in their application how they will meet the required minimum 25% match in accordance with 2 CFR §200.306.

The cost share/match may be provided in cash or can come from in-kind contributions, such as the use of volunteers and/or donated time, equipment, etc., subject to the regulations governing matching fund requirements at 2 CFR §200.306. Cost share/matching funds are considered grant funds and are included in the total award amount.

All contributions, including cash and third party in-kind, shall be accepted as cost sharing or matching when such contributions meet all of the following criteria: (1) Are verifiable from the non-Federal entity's records; (2) Are not included as contributions for any other Federal award; (3) Are necessary and reasonable for proper and efficient accomplishment of project or program objectives; (4) Are allowable under Subpart E—Cost Principles of 2 CFR Part 200; (5) Are not paid by the Federal Government under another Federal award, except where the Federal statute authorizing a program specifically provides that Federal funds made available for such program can be applied to matching or cost sharing requirements of other Federal programs; (6) Are provided for in the approved budget when required by the Federal awarding agency; and (7) Conform to other provisions of 2 CFR Part 200, as applicable.

Any restrictions on the use of grant funds (examples of funding restrictions are described in Section IV.E of this announcement) also apply to the use of cost share/matching funds.

C. Other

Applications must substantially comply with the application submission instructions and requirements set forth in Section IV of this announcement or they will be rejected. In addition, where a page limitation is expressed in Section IV with respect to parts of the application, pages in excess of the page limit will not be reviewed. In addition, applications must be submitted through Grants.gov as stated in Section IV of this announcement (except in the limited circumstances where another mode of submission is specifically allowed for as explained in Section IV) on or before the

application submission deadline published in Section IV of this announcement. Applicants are responsible for following the submission instructions in Section IV of this announcement (see Section IV.F. "Submission Instructions and Other Submission Requirements" for further information) to ensure that their application is timely submitted. Applications submitted after the submission deadline will be considered late and deemed ineligible without further consideration unless the applicant can clearly demonstrate that it was late due to EPA mishandling or because of technical problems associated with Grants.gov or relevant SAM.gov system issues. An applicant's failure to timely submit their application through Grants.gov because they did not timely or properly register in SAM.gov or Grants.gov will not be considered an acceptable reason to consider a late submission.

Also, applications exceeding the funding limits or project period term described herein will be rejected without review. Applications which do not provide the required non-federal cost share/match will be deemed ineligible. Further, applications that fail to demonstrate a public purpose of support or stimulation (e.g., by proposing research which primarily benefits a Federal program or provides a service for a Federal agency) will not be funded.

Applications deemed ineligible for funding consideration will be notified within fifteen calendar days of the ineligibility determination.

IV. APPLICATION AND SUBMISSION INFORMATION

Additional provisions that apply to this solicitation and/or awards made under this solicitation, including but not limited to those related to confidential business information, contracts and sub-awards under grants, and proposal assistance and communications, can be found at EPA Solicitation Clauses.

These, and the other provisions that can be found at the website link, are important, and applicants must review them when preparing applications for this solicitation. If you are unable to access these provisions electronically at the website above, please communicate with the EPA contact listed in this solicitation to obtain the provisions.

Formal instructions for submission through Grants.gov are in Section F.

A. Grants.gov Submittal Requirements and Limited Exception Procedures

Applicants, except as noted below, must apply electronically through Grants.gov under this funding opportunity based on the Grants.gov instructions in this announcement. If an applicant does not have the technical capability to apply electronically through Grants.gov because of limited or no internet access which prevents them from being able to upload the required application materials to Grants.gov, the applicant must contact OGDWaivers@epa.gov or the address listed below in writing (e.g., by hard copy, email) *at least 15 calendar days prior to the submission deadline under this announcement* to request approval to submit their application materials through an alternate method.

Mailing Address:
OGD Waivers
c/o Barbara Perkins
USEPA Headquarters

William Jefferson Clinton Building
1200 Pennsylvania Ave., N. W.
Mail Code: 3903R
Washington, DC 20460

Courier Address:
OGD Waivers
c/o Barbara Perkins
Ronald Reagan Building
1300 Pennsylvania Ave., N.W.
Rm # 51267
Washington, DC 20004

In the request, the applicant must include the following information:
Funding Opportunity Number (FON)
Organization Name and DUNS
Organization's Contact Information (email address and phone number)
Explanation of how they lack the technical capability to apply electronically through Grants.gov because of: 1) limited internet access or 2) no internet access which prevents them from being able to upload the required application materials through Grants.gov.

EPA will only consider alternate submission exception requests based on the two reasons stated above and will timely respond to the request -- all other requests will be denied. If an alternate submission method is approved, the applicant will receive documentation of this approval and further instructions on how to apply under this announcement. Applicants will be required to submit the documentation of approval with any initial application submitted under the alternative method. In addition, any submittal through an alternative method must comply with all applicable requirements and deadlines in the announcement including the submission deadline and requirements regarding proposal content and page limits (although the documentation of approval of an alternate submission method will not count against any page limits).

If an exception is granted, it is valid for submissions to EPA for the remainder of the entire calendar year in which the exception was approved and can be used to justify alternative submission methods for application submissions made through December 31 of the calendar year in which the exception was approved (e.g., if the exception was approved on March 1, 2016, it is valid for any competitive or non-competitive application submission to EPA through December 31, 2016). Applicants need only request an exception once in a calendar year and all exceptions will expire on December 31 of that calendar year. Applicants must request a new exception from required electronic submission through Grants.gov for submissions for any succeeding calendar year. For example, if there is a competitive opportunity issued on December 1, 2016 with a submission deadline of January 15, 2017, the applicant would need a new exception to submit through alternative methods beginning January 1, 2017.

Please note that the process described in this section is only for requesting alternate submission methods. All other inquiries about this announcement must be directed to the Agency Contact listed in Section VII of the announcement. Queries or requests submitted to the email address identified above for any reason other than to request an alternate submission method will not be acknowledged or answered.

B. Application Package Information
Use the application package available at Grants.gov (see Section IV.F. "Submission Instructions and Other Submission Requirements"). Note:

With the exception of the current and pending support form (available at How to Apply and Required Forms), all necessary forms are included in the electronic application package. Make sure to include the current and pending support form in your Grants.gov submission.

An email will be sent by NCER to the Lead/Contact PIand the Administrative Contact (see below) to acknowledge receipt of the application and transmit other important information. The email will be sent from receipt.application@epa.gov; emails to this address will not be accepted. *If you do not receive an email acknowledgement within 10 calendar days of the submission closing date, immediately inform the Electronic Submissions Contact shown in this solicitation. Failure to do so may result in your application not being reviewed.* See Section IV.F. "Submission Instructions and Other Submission Requirements" for additional information regarding the application receipt acknowledgment.

C. Content and Form of Application Submission
The application is made by submitting the materials described below. **Applications must contain all information requested and be submitted in the formats described.**

1. **Standard Form 424**

   The applicant must complete Standard Form 424. Instructions for completion of the SF424 are included with the form. (However, note that EPA requires that the entire requested dollar amount appear on the SF424, not simply the proposed first year expenses.) **Note that a minimum 25% non-federal cost share/match must be included.** The form must contain the signature of an authorized representative of the applying organization.

   Applicants are required to provide a unique entity identifier (formerly 'DUNS number') when applying for federal grants or cooperative agreements. Organizations may receive a unique entity identifier, at no cost, by calling the dedicated toll-free request line at 1-866-705-5711, or visiting the website at: Dun & Bradstreet EXIT .

   Executive Order 12372, "Intergovernmental Review of Federal Programs," does not apply to the Office of Research and Development's research and training programs unless EPA has determined that the activities that will be carried out under the applicants' proposal (a) require an Environmental Impact Statement (EIS), or (b) do not require an EIS but will be newly initiated at a particular site and require unusual measures to limit the possibility of adverse exposure or hazard to the general public, or (c) have a unique geographic focus and are directly relevant to the governmental responsibilities of a State or local government within that geographic area.

   If EPA determines that Executive Order 12372 applies to an applicant's proposal, the applicant must follow the procedures in 40 CFR Part 29. The applicant must notify their state's single point of contact (SPOC). To determine whether their state participates in this process, and how to comply, applicants should consult Intergovernmental Review (SPOC List). If an applicant is in a State that does not have a SPOC, or the State has not selected research and development grants for intergovernmental review, the applicant must notify directly affected State, area wide, regional and local entities of its proposal.

   EPA will notify the successful applicant(s) if Executive Order 12372

applies to its proposal prior to award.

2. **Key Contacts**

   The applicant must complete the "Key Contacts" form found in the Grants.gov application package. An "Additional Key Contacts" form is also available at How to Apply and Required Forms. The Key Contacts form should also be completed for major sub-agreements (i.e., primary investigators). Do not include information for consultants or other contractors. Please make certain that all contact information is accurate.

   For Multiple PI applications: The Additional Key Contacts form **must** be completed (see Section I.F. for further information). *Note: The Contact PI must be affiliated with the institution submitting the application. EPA will direct all communications related to scientific, technical, and budgetary aspects of the project to the Contact PI; however, any information regarding an application will be shared with any PI upon request.* The Contact PI is to be listed on the Key Contact Form as the Project Manager/Principal Investigator (the term Project Manager is used on the Grants.gov form, the term Principal Investigator is used on the form located at How to Apply and Required Forms). For additional PIs, complete the Major Co-Investigator fields and identify PI status next to the name (e.g., "Name: John Smith, Principal Investigator").

3. **Table of Contents**

   Provide a list of the major subdivisions of the application indicating the page number on which each section begins.

4. **Abstract** (1 page)

   The abstract is a very important document in the review process. Therefore, it is critical that the abstract accurately describes the research being proposed and conveys all the essential elements of the research. Also, the abstracts of applications that receive funding will be posted on EPA's Research Grants website.

   The abstract should include the information described below (a-h). Examples of abstracts for current grants may be found on EPA's Research Grants website.

   a. Funding Opportunity Title and Number for this proposal.
   b. Project Title: Use the exact title of your project as it appears in the application. The title must be brief yet represent the major thrust of the project. Because the title will be used by those not familiar with the project, use more commonly understood terminology. Do not use general phrases such as "research on."
   c. Investigators: For applications with multiple investigators, state whether this is a single Lead PI (with co-PIs) or Multiple PI application (see Section I.F.). For Lead PI applications, list the Lead PI, then the name(s) of each co-PI who will significantly contribute to the project. For Multiple PI applications, list the Contact PI, then the name(s) of each additional PI. Provide a website URL or an email contact address for additional information.
   d. Institution(s): In the same order as the list of investigators, list the name, city and state of each participating university or other applicant institution. The institution applying for assistance must be clearly identified.
   e. Project Period and Location: Show the proposed project beginning

and ending dates and the performance site(s)/geographical location(s) where the work will be conducted.

f. Project Cost: Show the total funding requested from the EPA (include direct and indirect costs for all years) as well as the non-federal cost share. Demonstrate how you will meet the required match requirement.

g. Project Summary: Provide three subsections addressing: (1) the objectives of the study (including any hypotheses that will be tested), (2) the experimental approach to be used (a description of the proposed project), and (3) the expected results (outputs/outcomes) of the project and how it addresses the research needs identified in the solicitation, including the estimated improvement in risk assessment or risk management that will result from successful completion of the proposed work.

h. Supplemental Keywords: Without duplicating terms already used in the text of the abstract, list keywords to assist database searchers in finding your research. A list of suggested keywords may be found at: How to Apply and Required Forms.

5. **Research Plan, Quality Assurance Statement, Human Subjects Research Statement, Data Plan and References**

a. Research Plan (15 pages)
Applications should focus on a limited number of research objectives that adequately and clearly demonstrate that they meet the RFA requirements. Explicitly state the main hypotheses that you will investigate, the data you will create or use, the analytical tools you will use to investigate these hypotheses or analyze these data, and the results you expect to achieve. Research methods must be clearly stated so that reviewers can evaluate the appropriateness of your approach and the tools you intend to use. A statement such as: “we will evaluate the data using the usual statistical methods” is not specific enough for peer reviewers.

This description must not exceed fifteen (15) consecutively numbered (bottom center), 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins. While these guidelines establish the minimum type size requirements, applicants are advised that readability is of paramount importance and should take precedence in selection of an appropriate font for use in the proposal.

The description must provide the following information:

1. Objectives: List the objectives of the proposed research and the hypotheses being tested during the project, and briefly state why the intended research is important and how it fulfills the requirements of the solicitation. This section should also include any background or introductory information that would help explain the objectives of the study. If this application is to expand upon research supported by an existing or former assistance agreement awarded under an EPA program, indicate the number of the agreement and provide a brief report of progress and results achieved under it.
2. Approach/Activities: Outline the research design, methods, and techniques that you intend to use in meeting the objectives stated above.
3. a. Innovation: Describe how your project shifts current research or engineering paradigms by using innovative theoretical concepts, approaches or methodologies, instrumentation or interventions applicable to one or more fields of research.

   b. Sustainability: Describe how your project embodies the principles of sustainability and seeks sustainable solutions that protect the environment and strengthen our communities. The sustainability primer (Sustainability Primer (PDF) (2 pp, 195 K)) provides examples of research activities that promote and incorporate sustainability principles.
4. Expected Results, Benefits, Outputs, and Outcomes: Describe the expected outputs and outcomes resulting from the project. This section should also discuss how the research results will lead to solutions to environmental problems and improve the public's ability to protect the environment and human health. A clear, concise description will help NCER and peer reviewers understand the merits of the research.
5. Project Management: Discuss other information relevant to the potential success of the project. This should include facilities, personnel expertise/experience, project schedules with associated milestones and target dates, proposed management, interactions with other institutions, etc. Describe the approach, procedures, and controls for ensuring that awarded grant funds will be expended in a timely and efficient manner and detail how project objectives will be successfully achieved within the grant period. Describe how progress toward achieving the expected results (outputs and outcomes) of the research will be tracked and measured. Applications for multi-investigator projects must identify project management and the functions of each investigator in each team and describe plans to communicate and share data.
6. Appendices may be included but must remain within the 15-page limit.

b. Quality Assurance Statement (3 pages)

For projects involving environmental data collection or processing, conducting surveys, modeling, method development, or the development of environmental technology (whether hardware-based or via new techniques), provide a Quality Assurance Statement (QAS) regarding the plans for processes that will be used to ensure that the products of the research satisfy the intended project objectives. Follow the guidelines provided below to ensure that the QAS describes a system that complies with ANSI/ASQC E4, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*. Do not exceed three consecutively numbered, 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins.

NOTE: If selected for award, applicants will be expected to provide additional quality assurance documentation.

Address each applicable section below by including the required information, referencing the specific location of the information in the Research Plan, or explaining why the section does not apply to the proposed research. (Not all will apply.)

1. Identify the individual who will be responsible for the quality assurance (QA) and quality control (QC) aspects of the research along with a brief description of this person's functions, experience, and authority within the research organization. Describe the organization's general approach for conducting quality research. *(QA is a system of management activities to ensure that a process or item is of the type and quality needed for the project. QC is a system of activities that measures the attributes and performance of a process or item against the*

standards defined in the project documentation to verify that they meet those stated requirements.)

2. Discuss project objectives, including quality objectives, any hypotheses to be tested, and the quantitative and/or qualitative procedures that will be used to evaluate the success of the project. Include any plans for peer or other reviews of the study design or analytical methods.

3. Address each of the following project elements as applicable:

    a. Collection of new/primary data:
    *(**Note:** In this case the word "sample" is intended to mean any finite part of a statistical population whose properties are studied to gain information about the whole. If certain attributes listed below do not apply to the type of samples to be used in your research, simply explain why those attributes are not applicable.)*

        i. Discuss the plan for sample collection and analysis. As applicable, include sample type(s), frequency, locations, sample sizes, sampling procedures, and the criteria for determining acceptable data quality (e.g., precision, accuracy, representativeness, completeness, comparability, or data quality objectives).
        ii. Describe the procedures for the handling and custody of samples including sample collection, identification, preservation, transportation, and storage, and how the accuracy of test measurements will be verified.
        iii. Describe or reference each analytical method to be used, any QA or QC checks or procedures with the associated acceptance criteria, and any procedures that will be used in the calibration and performance evaluation of the analytical instrumentation.
        iv. Discuss the procedures for overall data reduction, analysis, and reporting. Include a description of all statistical methods to make inferences and conclusions, acceptable error rates and/or power, and any statistical software to be used.

    b. Use of existing/secondary data (i.e., data previously collected for other purposes or from other sources):

        i. Identify the types of secondary data needed to satisfy the project objectives. Specify requirements relating to the type of data, the age of data, geographical representation, temporal representation, and technological representation, as applicable.
        ii. Specify the source(s) of the secondary data and discuss the rationale for selection.
        iii. Establish a plan to identify the sources of the secondary data in all deliverables/products.
        iv. Specify quality requirements and discuss the appropriateness for their intended use. Accuracy, precision, representativeness, completeness, and comparability need to be addressed, if applicable.
        v. Describe the procedures for determining the quality of the secondary data.
        vi. Describe the plan for data management/integrity.

    c. Method development:
    *(**Note:** The data collected for use in method development or*

evaluation should be described in the QAS as per the guidance in section 3A and/or 3B above.)

Describe the scope and application of the method, any tests (and measurements) to be conducted to support the method development, the type of instrumentation that will be used and any required instrument conditions (e.g., calibration frequency), planned QC checks and associated criteria (e.g., spikes, replicates, blanks), and tests to verify the method's performance.

d. Development or refinement of models:
*(**Note:** The data collected for use in the development or refinement of models should be described in the QAS as per the guidance in section 3A and/or 3B above.)*

   i. Discuss the scope and purpose of the model, key assumptions to be made during development/refinement, requirements for code development, and how the model will be documented.
   ii. Discuss verification techniques to ensure the source code implements the model correctly.
   iii. Discuss validation techniques to determine that the model (assumptions and algorithms) captures the essential phenomena with adequate fidelity.
   iv. Discuss plans for long-term maintenance of the model and associated data.

e. Development or operation of environmental technology:
*(**Note:** The data collected for use in the development or evaluation of the technology should be described in the QAS as per the guidance in section 3A and/or 3B above.)*

   i. Describe the overall purpose and anticipated impact of the technology.
   ii. Describe the technical and quality specifications of each technology component or process that is to be designed, fabricated, constructed, and/or operated.
   iii. Discuss the procedure to be used for documenting and controlling design changes.
   iv. Discuss the procedure to be used for documenting the acceptability of processes and components, and discuss how the technology will be benchmarked and its effectiveness determined.
   v. Discuss the documentation requirements for operating instructions/guides for maintenance and use of the system(s) and/or process(s).

f. Conducting surveys:
(Note: The data to be collected in the survey and any supporting data should be described in the QAS as per the guidance in section 3A and/or 3B above.)

Discuss the justification for the size of the proposed sample for both the overall project and all subsamples for specific treatments or tests. Identify and explain the rational for the proposed statistical techniques (e.g., evaluation of statistical power).

4. Discuss data management activities (e.g., record-keeping procedures, data-handling procedures, and the approach used for data storage and retrieval on electronic media). Include any required computer hardware and software and address any

specific performance requirements for the hardware/software configuration used.

c. EPA Human Subjects Research Statement (HSRS) (4 pages)
Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for pregnant women and fetuses, nursing women, and children at subparts B, C, and D. While retaining the same notation, subparts B, C, and D are substantively different in 40 CFR 26 than in the more commonly cited 45 CFR 46. Particularly noteworthy is that research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women, and children. EPA Policy Order 1000.17 Change A1 further clarifies this definition to include any intervention that manipulates their environment (i.e. modifies subjects' exposure). Research meeting the regulatory definition of observational research (any research that is not intentional exposure research) found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). These subparts also differ markedly from the language in 45 CFR 46. For more information, please see: Basic Information about Human Subjects Research.

Procedures for the review and oversight of human research subject to 40 CFR Part 26 are also provided in EPA Order 1000.17 Change A1. These include review of projects for EPA-supported human research by the EPA Human Subjects Research Review Official (HSRRO). EPA Order 1000.17 Change A1 requires preliminary approval by the HSRRO of all proposed EPA-supported human research before the agreement can be entered into. Additional requirements must be met and final approval received from the HSRRO before the research can begin. When reviewing human observational exposure studies, EPA Order 1000.17 Change A1 requires the HSRRO to apply the principles described in the SEAOES (PDF) (132 pp, 1.79 MB) document and grant approval only to studies that adhere to those principles.

All applications submitted under this solicitation must include a HSRS as described below. For more information about what constitutes human subjects research, please see: Basic Information about Human Subjects Research. For information on the prohibition on the inclusion of vulnerable subjects in intentional exposure research, please see: Basic Information about Human Subjects Research.

Human Subjects Research Statement (HSRS) Requirements
If the proposed research **does not** involve human subjects as defined above, provide the following statement in your application package as your HSRS: "The proposed research does not involve human subjects." Applicants should provide a clear justification about how the proposed research does not meet the definition (for example, all samples come from deceased individuals OR samples are purchased from a commercial source and provided without identifiers, etc.).

If the proposed research **does** involve human subjects, then include in your application package a HSRS that addresses each applicable section listed below, referencing the specific location of the information in the Research Plan, providing the information in the

HSRS, or explaining why the section does not apply to the proposed research. (Not all will apply.) Please note that even research that has been determined to be exempt from the human subjects regulations by an IRB must be reviewed by the EPA HSRRO. Therefore, consider exempt research to include human subjects work for this EPA solicitation. Do not exceed **four** consecutively numbered, 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins. The factors below are not intended to be exhaustive of all those needed for the HSRRO to provide the final approval necessary for research to be conducted, but provide a basis upon which the human subjects oversight review may begin.

NOTE: Researchers must provide evidence of an assurance on file with the U.S. Department of Health and Human Services (HHS) or other Federal Agency that it will comply with regulatory provisions in the Common Rule. In special circumstances where there is no such assurance, EPA will work with investigators to obtain an assurance from HHS or another source.

Complete all items below for studies involving human subjects.
Protection of Human Subjects (*Adapted from National Institutes of Health Supplemental Instructions for PHS 398 and SF424 (R&R) II-10)

1. Risks to Human Subjects
    a. Human Subjects Involvement, Characteristics, and Design
        - Describe and justify the proposed involvement of human subjects in the work outlined in the Research Strategy section.
        - Describe the characteristics of the subject population, including their anticipated number, age range, and health status, if relevant.
        - Describe and justify the sampling plan, including retention strategies and the criteria for inclusion or exclusion of any subpopulation.
        - Explain the rationale for the involvement of special vulnerable populations, such as pregnant women, children, or others who may be considered vulnerable populations.
        - If relevant to the proposed research, describe procedures for assignment to a study group. As related to human subjects protection, describe and justify the selection of an intervention’s dose, frequency and administration.
        - List any collaborating sites where human subjects research will be performed, and describe the role of those sites and collaborating investigators in performing the proposed research. Explain how data from the site(s) will be obtained, managed, and protected.
    b. Sources of Materials
        - Describe the research material obtained from living individuals in the form of specimens, records, or data.
        - Describe any data that will be collected from human subjects for the project(s) described in the application.
        - Indicate who will have access to individually identifiable private information about human subjects.
        - Provide information about how the specimens, records, and/or data are collected, managed, and protected as well as whether material or data that include individually identifiable private information will be collected specifically for the proposed research project.
    c. Potential Risks

- Describe all the potential risks to subjects posed by participation in the research (physical, psychological, financial, legal, or other), and assess their likelihood and seriousness to the human subjects.
- Where appropriate, describe alternative treatments and procedures, including the risks and potential benefits of the alternative treatments and procedures, to participants in the proposed research.

2. Adequacy of Protection Against Risks
   a. Recruitment and Informed Consent
      - Describe plans for the recruitment of subjects (where appropriate) and the process for obtaining informed consent. If the proposed studies will include children, describe the process for meeting requirements for parental permission and child assent.
      - Include a description of the circumstances under which consent will be sought and obtained, who will seek it, the nature of the information to be provided to prospective subjects, and the method of documenting consent. If a waiver of some or all of the elements of informed consent will be sought, provide justification for the waiver.

   b. Protections Against Risk
      - Describe planned procedures for protecting against or minimizing potential risks, including risks to privacy of individuals or confidentiality of data, and assess their likely effectiveness.
      - Research involving vulnerable populations, as described in the EPA regulations, Subparts B-D, must include additional protections. Refer to EPA guidance:
        - Prohibition of Research Conducted or Supported by EPA Involving Intentional Exposure of Human Subjects who are Children or Pregnant or Nursing Women Basic Information about Human Subjects Research
        - Additional Protections for Pregnant Women and Fetuses Involved as Subjects in Observational Research Conducted or Supported by EPA Basic Information about Human Subjects Research
        - Additional Protections for Children Involved as Subjects in Observational Research Conducted or Supported by EPA Basic Information about Human Subjects Research
      - Where appropriate, discuss plans for ensuring necessary medical or professional intervention in the event of adverse effects to the subjects. Studies that involve clinical trials must include a general description of the plan for data and safety monitoring of the clinical trials and adverse event reporting to the IRB, the DSMB (if one has been established for the trial), the EPA and others, as appropriate, to ensure the safety of subjects.

3. Potential Benefits of the Proposed Research to Human Subjects and Others
   - Discuss the potential benefits of the research to research participants and others.
   - Discuss why the risks to subjects are reasonable in relation to the anticipated benefits to research participants and others.
   - Please note that financial compensation of subjects is not considered to be a benefit of participation in research.

4. Importance of the Knowledge to be Gained
   - Discuss the importance of the knowledge to be gained as a result of the proposed research.
   - Discuss why the risks to subjects are reasonable in relation to

the importance of the knowledge that reasonably may be expected to result.

Note that an Interventional Study (or Clinical Trial) is a clinical study in which participants are assigned to receive one or more interventions (or no intervention) so that researchers can evaluate the effects of the interventions on biomedical or health-related outcomes; the assignments are determined by the study protocol.

d. Data Plan (2 pages)
Provide a plan to make all data resulting from an agreement under this RFA available in a format and with documentation/metadata such that they may be used by others in the scientific community. This includes data produced under the award, i.e., from observations, analyses, or model development collected or used under the agreement. Applicants who plan to develop or enhance databases containing proprietary or restricted information must provide, within the two pages, a strategy to make the data widely available, while protecting privacy or property rights.

e. References: References cited are in addition to other page limits (e.g., research plan, quality assurance statement).

6. **Budget and Budget Justification**

a. Budget
Prepare a master budget table using "SF-424A Budget Information for Non-Construction Programs" (aka SF-424A), available in the Grants.gov electronic application package and also at How to Apply and Required Forms. Provide the federal funds being requested and non-federal cost share being contributed in "Section A-Budget Summary" under the "New or Revised Budget" heading. In "Section B-Budget Categories," provide the object class budget category (a. - k.) amounts for each budget year under the "Grant Program, Function or Activity" heading. Each column reflects a separate budget year. For example, Column (1) reflects budget year 1. The total budget will be automatically tabulated in column (5).

Please note that a minimum 25% non-federal cost-share is required. Cost shared amounts must be listed in the SF-424A and described in the budget justification.

Applicants may not use subagreements to transfer or delegate their responsibility for successful completion of their EPA assistance agreement. Please refer to EPA Solicitation Clauses if your organization intends to identify specific contractors, including consultants, and subawardees in your proposal.

b. Budget Justification *[3 pages in addition to the Section IV.C.5. page limitations]*

Describe the basis for calculating the personnel, fringe benefits, travel, equipment, supplies, contractual support, and other costs identified in the SF-424A. The budget justification should not exceed three consecutively numbered (bottom center), 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins.

Budget information should be supported at the level of detail described below:

1. Personnel: List all staff positions by title. Give annual salary, percentage of time assigned to the project, total cost for the

budget period, and project role. Compensation paid for employees engaged in grant activities must be consistent with payments for similar work within the applicant organization. Note that for salaries to be allowable as a direct charge to the award, a justification of how that person will be directly involved in the project must be provided. General administrative duties such as answering telephones, filing, typing, or accounting duties are not considered acceptable.

Below is a sample computation for Personnel:

Position/Title	**Annual Salary**	**% of Time Assigned to Project**	**Cost**
Project Manager	$70,000	50%	$ 35,000
Env. Specialist	$60,000	100%	$ 60,000
Env. Health Tech	$45,000	100%	$ 45,000
Total Personnel			**$140,000**

Note this budget category is limited to persons employed by the applicant organization ONLY. Those employed elsewhere are classified as subawardees, program participants, contractors or consultants. Contractors and consultants should be listed under the “Contractual” budget heading. Subawards made to eligible subrecipients are listed under the “Other” budget heading. Participant support costs such as stipends or travel assistance for trainees (e.g. interns or fellows) are listed under the “Other” budget heading.

2. Fringe Benefits: Identify the percentage used and the basis for its computation. Fringe benefits are for the personnel listed in budget category (1) above and only for the percentage of time devoted to the project. Fringe benefits include but are not limited to the cost of leave, employee insurance, pensions and unemployment benefit plans. The applicant should not combine the fringe benefit costs with direct salaries and wages in the personnel category.

3. (3) Travel: Specify the estimated number of trips, purpose of each trip, number of travelers per trip, destinations, and other costs for each type of travel. Explain the need for any travel, paying particular attention to travel outside the United States. Foreign travel includes trips to Mexico and Canada but does not include trips to Puerto Rico, the U.S. Territories or possessions. If EPA funds will not be used for foreign travel, the budget justification must expressly state that the applicant will not use EPA funds for foreign travel without approval by EPA. Include travel funds for annual program progress reviews (estimate for two days in Washington, D.C.) and a final workshop to report on results.

Below is a sample computation for Travel:

Purpose of Travel	Location	Item	Computation	Cost
EPA Progress Review	DC	Lodging	4 people x $100 per night x 2 nights	$800
		Airfare	4 people x $500 round trip	$2,000
		Per Diem	4 people x $50 per day x 2 days	$400
Total Travel				**$3,200**

4. Equipment: Identify all tangible, non-expendable personal property to be purchased that has an acquisition cost of $5,000 or more per unit and a useful life of more than one year. Equipment also includes accessories and services included with the purchase price necessary for the equipment to be operational. It does not include: (1) equipment planned to be leased/rented; or (2) separate equipment service or maintenance contracts. Details such as the type of equipment, cost, and a brief narrative on the intended use of the equipment for project objectives are required. Each item of equipment must be identified with the corresponding cost. Particular brands of equipment should not be identified. General-purpose equipment (office equipment, etc.) must be justified as to how it will be used on the project. (Property items with a unit cost of less than $5,000 are considered supplies.)

5. Supplies: “Supplies” means tangible property other than “equipment.” Identify supplies to be used under the project. This may include: software, office supplies, and laboratory supplies such as reagents, chemicals and glassware. Specifically identify computers/laptops to be purchased or upgraded.

6. Contractual: List the proposed contractual activities along with a brief description of the scope of work or services to be provided, the proposed duration of the contract/procurement, the estimated cost, and the proposed procurement method (competitive or non-competitive). **Any procurement of services from individual consultants or commercial firms (including space for workshops) must comply with the competitive procurement requirements of 2 CFR Part 200.317-200.326. Please see EPA Solicitation Clauses for more details.**

   Examples of Contractual costs include:

   i. Consultants – Consultants are individuals with specialized skills who are paid at a daily or hourly rate. EPA’s

participation in the salary rate (excluding overhead) paid to individual consultants retained by recipients or by a recipient's contractors or subcontractors is limited to the maximum daily rate for a Level IV of the Executive Schedule (formerly GS-18), to be adjusted annually.

ii. Speaker/Trainer Fees – Information on speakers should include the fee and a description of the services they are providing.

7. Other: List each item in sufficient detail for the EPA to determine the reasonableness of its cost relative to the research to be undertaken. “Other” items may include equipment rental, long distance telephone charges, and photocopying costs. Note that subawards, such as those with other universities or nonprofit research institutions for members of the research team, are included in this category. **Provide the total costs proposed for subawards as a separate line item in the budget justification and brief description of the activities to be supported for each subaward or types of subawards if the subrecipients have not been identified.** Subawards may not be used to acquire services from consultants or commercial firms. Please see EPA Solicitation Clauses for more details. The “Other” budget category also includes participant support costs such as stipends or travel assistance for trainees (e.g. interns or fellows). **Provide the total costs proposed for participant support costs as a separate line item in the budget justification and brief description of the costs.** If EPA funds will not be used for foreign travel by program participants, the budget justification must expressly state that the applicant will not use EPA funds for foreign travel without approval by EPA.

8. Indirect Costs: : If your organization does not have a cognizant agency, and does not intend to use the 10% de minimis indirect cost rate authorized by 2 CFR 200.414(f) please note that in the budget justification and provide a brief explanation for how you plan to obtain an indirect cost rate.

7. **Resumes**

   Provide resumes for each investigator and important co-worker. You may include resumes from staff of subawardees such as universities. Do not include resumes of consultants or other contractors. The resume is not limited to traditional materials, but should provide materials to clearly and appropriately demonstrate that the investigator has the knowledge needed to perform their component of the proposed research. The resume for each individual must not exceed two consecutively numbered (bottom center), 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins.

   Alternative to a standard resume, you may use a profile such as an NIH BioSketch that can be generated in SciENcv (see SciENcv for information on SciENcv; also see My NCBI Curriculum Vitae Web Application: SciENcv). These materials should generally conform to the requirements for a resume (e.g., content and page number).

8. **Current and Pending Support**

   Complete a current and pending support form (Research Funding Opportunities: How to Apply and Required Forms) for each investigator and important co-worker. Do not include current and pending support

for consultants or other contractors. Include all current and pending research regardless of source.

Note to all prospective applicants requiring multiple Current and Pending Support Form pages: Due to a limitation in Adobe Acrobat's forms functionality, additional pages cannot be directly inserted into the original PDF form and preserve the form data on the subsequent pages. Multiple page form submissions can be created in Acrobat 8 and later using the "PDF Package" option in the "Create PDF from Multiple Files" function. If you have an earlier version of Adobe Standard or Professional, applicants will need to convert each PDF page of the form to an EPS (Encapsulated Post Script) file before creating the PDF for submission. The following steps will allow applicants with earlier versions of Adobe Standard or Professional to create a PDF package:

1. Populate the first page of the PDF, and save it as a EPS (Encapsulated Post Script) file.
2. Reopen the form, and populate it with the data for page 2. Save this page as a different EPS file. Repeat for as many pages as necessary.
3. Use Acrobat Distiller to convert the EPS files back to PDF.
4. Open Acrobat Professional, and combine the individual pages into a combined PDF file.

9. **Guidelines, Limitations, and Additional Requirements**

   a. Letters of Intent/Letters of Support
   Letters of intent to provide resources for the proposed research or to document intended interactions are limited to one brief paragraph committing the availability of a resource (e.g., use of a person's time or equipment) or intended interaction (e.g., sharing of data, as-needed consultation) that is described in the Research Plan. Letters of intent are to be included as an addition to the budget justification documents. EPA employees are not permitted to provide letters of intent for any application.

   Letters of support do not commit a resource vital to the success of the proposal. A letter of support is written by businesses, organizations, or community members stating their support of the applicant's proposed project. EPA employees are not permitted to provide letters of support for any application.

   Note: Letters of intent or support must be part of the application; letters submitted separately will not be accepted. Any letter of intent or support that exceeds one brief paragraph (excluding letterhead and salutations), is considered part of the Research Plan and is included in the 15-page Research Plan limit. Any transactions between the successful applicant and parties providing letters of intent or support financed with EPA grant funds are subject to the contract and subaward requirements described here EPA Solicitation Clauses.

   b. Funding Opportunity Number(s) (FON)
   At various places in the application, applicants are asked to identify the FON.

   The Funding Opportunity Number for this RFA is:
   National Priorities: Transdisciplinary Research into Detecting and Controlling Lead in Drinking Water, EPA-G2017-ORD-F1

   c. Confidentiality
   By submitting an application in response to this solicitation, the applicant grants the EPA permission to make limited disclosures of

the application to technical reviewers both within and outside the Agency for the express purpose of assisting the Agency with evaluating the application. Information from a pending or unsuccessful application will be kept confidential to the fullest extent allowed under law; information from a successful application may be publicly disclosed to the extent permitted by law.

D. Submission Dates and Times

Applications **must be transferred to Grants.gov no later than 11:59:59 pm Eastern Time** on the solicitation closing date. Applications transferred after the closing date and time will be returned to the sender without further consideration. EPA will not accept any changes to applications after the closing date.

It should be noted that this schedule may be changed without prior notification because of factors not anticipated at the time of announcement. In the case of a change in the solicitation closing date, a new date will be posted on the EPA's Research Grants web site (Research Grants) and a modification posted on Grants.gov.

Solicitation Closing Date: August 15, 2017, 11:59:59 pm Eastern Time (applications ***must*** be submitted to Grants.gov by this time, see Section IV.F "Submission Instructions and Other Submission Requirements" for further information).

NOTE: Customarily, applicants are notified about evaluation decisions within six months of the solicitation closing date. Awards are generally made 9-12 months after the solicitation closing date.

E. Funding Restrictions

The funding mechanism for all awards issued under ORD solicitations will consist of assistance agreements from the EPA. All award decisions are subject to the availability of funds. In accordance with the Federal Grant and Cooperative Agreement Act, 31 U.S.C. 6301 et seq., the primary purpose of an assistance agreement is to accomplish a public purpose of support or stimulation authorized by federal statute, rather than acquisition for the direct benefit or use of the Agency. In issuing a grant, the EPA anticipates that there will be no substantial EPA involvement in the design, implementation, or conduct of the research. However, the EPA will monitor research progress through annual reports provided by grantees and other contacts, including site visits, with the Principal Investigator(s).

EPA award recipients may incur allowable project costs 90 calendar days before the Federal awarding agency makes the Federal award. Expenses more than 90 calendar days pre-award require prior approval of EPA. All costs incurred before EPA makes the award are at the recipient's risk. EPA is under no obligation to reimburse such costs if for any reason the recipient does not receive a Federal award or if the Federal award is less than anticipated and inadequate to cover such costs.

If you wish to submit applications for more than one EPA funding opportunity you must ensure that the research proposed in each application is significantly different from any other that has been submitted to the EPA or from any other financial assistance you are currently receiving from the EPA or other federal government agency.

Collaborative applications involving more than one institution must be submitted as a single administrative package from one of the institutions involved.

Each proposed project must be able to be completed within the project period and with the initial award of funds. Applicants should request the entire amount of money needed to complete the project. Recipients should not anticipate additional funding beyond the initial award of funds for a specific project.

F. Submission Instructions and Other Submission Requirements
Please read this entire section before attempting an electronic submission through Grants.gov.

If you do not have the technical capability to utilize the Grants.gov application submission process for this solicitation, see Section IV.A above for additional guidance and instructions.

Note: Grants.gov submission instructions are updated on an as-needed basis. Please provide your Authorized Organizational Representative (AOR) with a copy of the following instructions to avoid submission delays that may occur from the use of outdated instructions.

1. Preparing for Submission. The electronic submission of your application must be made by an official representative of your institution who is registered with Grants.gov and is authorized to sign applications for Federal assistance. For more information on the registration requirements that must be completed in order to submit an application through Grants.gov, go to Grants.gov and click on “Register” at the top right corner of the page. If your organization is not currently registered with Grants.gov, please encourage your office to designate an Authorized Organization Representative (AOR) and ask that individual to begin the registration process as soon as possible. Please note that the registration process also requires that your organization have a unique entity identifier (formerly ‘DUNS’ number) and a current registration with the System for Award Management (SAM) and the process of obtaining both could take a month or more. Applicants must ensure that all registration requirements are met in order to apply for this opportunity through Grants.gov and should ensure that all such requirements have been met well in advance of the submission deadline. Registration on Grants.gov, SAM.gov, and unique entity identifier assignment is FREE.

   Applicants need to ensure that the AOR who submits the application through Grants.gov and whose DUNS number is listed on the application is an AOR for the applicant listed on the application. Additionally, the DUNS number listed on the application must be registered to the applicant organization’s SAM account. If not, the application may be deemed ineligible.

   To begin the application process under this grant announcement, go to Grants.gov and click on “Applicants” on the top of the page and then “Apply for Grants” from the drop-down menu and then follow the instructions accordingly. Please note: To apply through Grants.gov, you must use Adobe Reader software and download the compatible Adobe Reader version. For more information about Adobe Reader, to verify compatibility, or to download the free software, please visit Grants.gov Adobe Software Compatability

   You may also be able to access the application package for this announcement by searching for the opportunity on Grants.gov. Go to Grants.gov and then click on “Search Grants” at the top of the page and enter the Funding Opportunity Number, EPA-F2017-ORD-F1, or the

CFDA number that applies to the announcement (CFDA 66.511), in the appropriate field under "Basic Search Criteria".

Please note that Grants.gov is strongly encouraging users to sign up for and use their "Workspace" feature when applying for opportunities. Grants.gov will be phasing out the "legacy" application process, so EPA recommends that all applicants begin using Workspace as soon as possible so they are prepared when the "legacy" application process is no longer available.

2. Acknowledgement of Receipt. The complete application must be transferred to Grants.gov no later than 11:59:59 pm Eastern Time on the solicitation closing date (see "Submission Dates and Times"). Applications submitted through Grants.gov will be time and date stamped electronically. Grants.gov provides an on-screen notification of successful initial transfer as well as an email notification of successful transfer from Grants.gov to EPA. While it is advisable to retain copies of these Grants.gov acknowledgements to document submission, *the only official documentation that the application has been received by NCER is the email acknowledgement sent by NCER to the Lead/Contact PI and the Administrative Contact.* This email will be sent from receipt.application@epa.gov; emails to this address will not be accepted. ***If an email acknowledgment from*** receipt.application@epa.gov ***has not been received within 10 calendar days of the solicitation closing date, immediately inform the Electronic Submissions Contact shown in this solicitation. Failure to do so may result in your application not being reviewed.***

3. Application Package Preparation. Your organization's AOR must submit your complete application package electronically to EPA through Grants.gov (Grants.gov) no later than August 15, 2017, 11:59:59 pm Eastern Time. Please allow for enough time to successfully submit your application and allow for unexpected errors that may require you to resubmit.

   Please submit all of the application materials described below using the Grants.gov application package that you downloaded using the instructions above. For additional instructions on completing and submitting the electronic application package, click on the "Show Instructions" tab that is accessible within the application package itself.

   The application package consists of the following mandatory documents.

   a. Application for Federal Assistance (SF 424): Complete the form except for the "competition ID" field.
   b. EPA Key Contacts Form 5700-54: Complete the form. If additional pages are needed, see (d) below.
   c. SF-424A Budget Information for Non-Construction Programs: Provide the federal funds being requested and non-federal cost share being contributed in "Section A-Budget Summary" under the "New or Revised Budget" heading. In "Section B-Budget Categories," provide the object class budget category (a. - k.) amounts for each budget year under the "Grant Program, Function or Activity" heading. Each column reflects a separate budget year.
   d. Project Narrative Attachment Form (click on "Add Mandatory Project Narrative"): Attach a single electronic PDF file labeled "Application" that contains the items described in Section IV.C.3. through IV.C.9.a [Table of Contents, Abstract, Research Plan, Quality Assurance Statement, Human Subjects Research Statement, Data Plan,

References, Budget Justification, Resumes, Current and Pending Support, and Letters of Intent/Support] of this solicitation. *In order to maintain format integrity*, *this file must be submitted in Adobe Acrobat PDF.* Please review the PDF file for conversion errors prior to including it in the electronic application package; requests to rectify conversion errors will not be accepted if made after the solicitation closing date and time. If Key Contacts Continuation pages (see Research Funding Opportunities: How to Apply and Required Forms) are needed, place them before the Table of Contents (Section IV.C.3.).

Once the application package has been completed, the "Submit" button should be enabled. If the "Submit" button is not active, please call Grants.gov for assistance at 1-800-518-4726. Applicants who are outside the U.S. at the time of submittal and are not able to access the toll-free number may reach a Grants.gov representative by calling 606-545-5035. Investigators should save the completed application package with two different file names before providing it to the AOR to avoid having to re-create the package should submission problems be experienced or a revised application needs to be submitted. Note: Revised applications must be submitted before the solicitation closing date and time.

4. Submitting the application. The application package must be transferred to Grants.gov by an AOR. The AOR should close all other software before attempting to submit the application package. Click the "submit" button of the application package. Your Internet browser will launch and a sign-in page will appear. ***Note: Minor problems are not uncommon with transfers to Grants.gov. It is essential to allow sufficient time to ensure that your application is submitted to Grants.gov BEFORE 11:59:59 pm Eastern Time on the solicitation closing date.*** The Grants.gov support desk operates 24 hours a day, seven days a week, except Federal Holidays.

   A successful transfer will end with an on-screen acknowledgement. For documentation purposes, print or screen capture this acknowledgement. If a submission problem occurs, reboot the computer – turning the power off may be necessary – and re-attempt the submission.

   Note: Grants.gov issues a "case number" upon a request for assistance.

5. Transmission Difficulties. If transmission difficulties that result in a late transmission, no transmission, or rejection of the transmitted application are experienced, and following the above instructions do not resolve the problem so that the application is submitted to Grants.gov by the deadline date and time, follow the guidance below. The Agency will make a decision concerning each late submission on a case-by-case basis as to whether it should be forwarded for peer review. All emails, as described below, are to be sent to Debra M. Jones (jones.debram@epa.gov) with the FON in the subject line.

   Be aware that EPA will only consider accepting applications that were unable to transmit due to Grants.gov or relevant Sam.gov system issues or for unforeseen exigent circumstances, such as extreme weather interfering with internet access. Failure of an applicant to submit timely because they did not properly or timely register in SAM.gov or Grants.gov is not an acceptable reason to justify acceptance of a late submittal.

Please note that if the application you are submitting is greater than 70 MB in size, please call or send an email message to the Electronic Submissions Contact listed for this RFA. The Agency may experience technical difficulty downloading files of this size from Grants.gov. Therefore, it is important that the Agency verify that the file can be downloaded. The Agency will provide alternate submission instructions if the file cannot be downloaded.

a. If you are experiencing problems resulting in an inability to upload the application to Grants.gov, it is essential to call Grants.gov for assistance at 1-800-518-4726 before the application deadline. Applicants who are outside the U.S. at the time of submittal and are not able to access the toll-free number may reach a Grants.gov representative by calling 606-545-5035. Be *sure* to obtain a case number from Grants.gov. If the problems stem from unforeseen exigent circumstances unrelated to Grants.gov, such as extreme weather interfering with internet access, contact Debra M. Jones (jones.debram@epa.gov).
b. Unsuccessful transfer of the application package: If a successful transfer of the application cannot be accomplished even with assistance from Grants.gov due to electronic submission issues or unforeseen exigent circumstances, send an email message to Debra M. Jones (jones.debram@epa.gov) by 11:59:59 pm Eastern Time on the solicitation closing date. The email message must document the problem and include the Grants.gov case number as well as the entire application in PDF format as an attachment.
c. Grants.gov rejection of the application package: If a notification is received from Grants.gov stating that the application has been rejected for reasons other than late submittal, promptly send an email to Debra M. Jones (jones.debram@epa.gov) with the FON in the subject line within one business day of the closing date of this solicitation. The email should include any materials provided by Grants.gov and attach the entire application in PDF format.

Please note that successful submission through Grants.gov or via email does not necessarily mean your application is eligible for award.

V. APPLICATION REVIEW INFORMATION

A. Peer Review

All eligible grant applications are reviewed by appropriate external technical peer reviewers based on the criteria and process described below. This review is designed to evaluate each application according to its scientific merit. The individual external peer reviewers include non-EPA scientists, engineers, social scientists, and/or economists who are accomplished in their respective disciplines and proficient in the technical subjects they are reviewing.

Prior to the external technical peer review panel meeting, all reviewers will receive electronic copies of all applications, as well as a full set of abstracts for the applications. Each application will be assigned to a minimum of three primary peer reviewers, one of whom will be assigned the role of Rapporteur. Each reviewer will be assigned up to approximately 10 applications on which to serve as a primary reviewer. During the review period leading up to the panel meeting, primary reviewers will read the full set of abstracts and entire application package for each application they are assigned. They will also prepare a written individual evaluation for each assigned application that addresses the peer review criteria described below and rate the application with a score of excellent, very good, good, fair, or poor.

At the beginning of the panel meeting, each primary reviewer will report their ratings for the applications they reviewed. Those applications receiving at least two ratings of *Very Good* or one rating of *Excellent* from among the primary reviewers will then be further discussed by the panel in terms of the peer review criteria below. In addition, if there is one *Very Good* rating among the primary reviewers of an application, the primary reviewer, whose initial rating is the *Very Good*, may request discussion of the application by the peer review panel. All other applications will be declined for further consideration.

After the discussion of an application by the panel, the primary reviewers may revise their initial ratings and if they do so, this will also be documented. The final ratings of the primary reviewers will then be translated by EPA into the final peer review score (excellent, very good, good, fair, or poor) for the application. This is reflected in a peer review results document developed by the Rapporteur which combines the individual initial and final evaluations of the primary reviewers and captures any substantive comments from the panel discussion. This score will be used to determine which applications undergo the internal programmatic review discussed below. A peer review results document is also developed for applications that are not discussed. However, this document is a consolidation of the individual primary reviewer initial evaluations, with an average of the scores assigned by the primary reviewers.

Peer reviewers consider an application's merit based on the extent to which the application demonstrates the criteria below. Criteria are listed in descending order of importance (i.e., Criteria 1 has the heaviest weight).

1. Research Merits (subcriteria are in descending order of importance):
    a. The degree to which the application demonstrates that the research is original and contributes to the scientific knowledge in the topic area. And the degree to which the application demonstrates that the project (and its approach) is defensible and technically feasible, and uses appropriate and adequate research methods.
    b. The degree to which the application demonstrates that the project results will produce benefits to the public (such as improvements to the environment or human health) and will be disseminated to enhance scientific and technological understanding.
2. Responsiveness: The degree to which the application demonstrates that the research is responsive to the objectives, research needs, and special considerations specified by the RFA, including whether the research is national in scope. Proposals are most responsive to this RFA if they address all of the research needs identified in Section I.D and those that do so may be rated more highly than those that do not.
3. Project Management (subcriteria are equally weighted):
    a. Investigators: The degree to which the application demonstrates that the Principal Investigator(s) and other key personnel have the appropriate qualifications (including research training, demonstrated knowledge of pertinent literature, experience, and publication records).
    b. Management: The degree to which the application demonstrates that the project will be adequately managed to ensure the timely and successful achievement of objectives using appropriate project schedules and milestones. And the degree to which the application demonstrates the applicant will adequately track and measure progress toward achieving expected results (outputs and outcomes).
    c. Quality Assurance (QA): The degree to which the application includes an appropriate and adequate QA Statement.

   d. Resources and Cost Controls: The degree to which the application demonstrates that the facilities, equipment, and budget are appropriate, adequate, and available. And the degree to which the application demonstrates that well-defined and acceptable approaches, procedures, and controls are used to ensure timely and efficient expenditure of awarded grant funds.

4. Other Factors (subcriteria are equally weighted):
   a. Innovation: The degree to which the application demonstrates that the research will challenge and seek to shift current research or engineering paradigms by using innovative theoretical concepts, approaches or methodologies, instrumentation or interventions applicable to one or more fields of research.
   b. Sustainability: The degree to which the application demonstrates that the research will embody the principles of sustainability and seek sustainable solutions that protect the environment and strengthen our communities. The sustainability primer (see link) provides examples of research activities that promote and incorporate sustainability principles (Sustainability Primer (PDF) (2 pp, 195 K)).

B. Programmatic Review

Applications receiving final peer review scores of excellent or very good will then undergo an internal programmatic review, as described below, conducted by experts from the EPA, including individuals from the Office of Research and Development (ORD) and program and regional offices involved with the science or engineering proposed. All other applications are automatically declined.

Those applicants who received final scores of excellent or very good as a result of the peer review process will be asked to provide additional information for the programmatic review pertaining to the proposed Lead PI's (in the case of Multiple-PI applications, the Contact PI's) "Past Performance and Reporting History." The applicant must provide the EPA Project Officer with information on the proposed Lead/Contact PI's past performance and reporting history under prior Federal agency assistance agreements (assistance agreements include grants and cooperative agreements but not contracts) in terms of: (i) the level of success in managing and completing each agreement, and (ii) history of meeting the reporting requirements under each agreement.

This information is required only for the proposed Lead/Contact PI's performance under Federal assistance agreements initiated within the last three years that were similar in size and scope to the proposed project.

The specific information required for each agreement is shown below, and must be provided within one week of EPA's request. A maximum of three pages will be permitted for the response; excess pages will not be reviewed. **Note: If no prior past performance information and/or reporting history exists, you will be asked to so state.**

1. Name of Granting Agency.
2. Grant/Cooperative agreement number.
3. Grant/Cooperative agreement title.
4. Brief description of the grant/cooperative agreement.
5. A description of how the agreement is similar in size and scope to the proposed project and whether or not it was successfully managed and completed; if not successfully managed and completed, provide an explanation.
6. Information relating to the proposed Lead/Contact PI's past performance in reporting on progress towards achieving the expected

results (outputs/outcomes) under the agreement. Include the history of submitting timely progress/final technical reports, describe how progress towards achieving the expected results was reported/documented, and if such progress was not being made, provide an explanation of whether, and how, this was reported.
7. Total (all years) grant/cooperative agreement dollar value.
8. Project period.
9. Technical contact (project officer), telephone number, and Email address (if available).

The purpose of the programmatic review is to ensure an integrated research portfolio for the Agency and help determine which applications to recommend for award. In conducting the programmatic review, the EPA will consider information provided by the applicant and may consider information from other sources, including prior and current grantors and agency files.

The internal programmatic review panel will assess the following [criteria are listed in descending order of importance (i.e., Criteria 1 has the heaviest weight)]:

1. The relevance of the proposed science to EPA research priorities.
2. The proposed Lead/Contact PI's past performance under Federal agency assistance agreements (assistance agreements include grants and cooperative agreements but not contracts) initiated within the last three years that were similar in size and scope to the proposed project in two areas: First, in successfully managing and completing these prior Federal assistance projects, including whether there is a satisfactory explanation for any lack of success. Second, in reporting progress toward achieving results (outputs/outcomes) under these agreements, including the proposed Lead/Contact PI's history of submitting timely progress/final technical reports that adequately describe the progress toward achieving the expected results under the agreements. Any explanation of why progress toward achieving the results was not made will also be considered. Applicants whose proposed Lead PI/Contact PI has no relevant past performance and/or reporting history, or for whom this information is not available, will be evaluated neither favorably nor unfavorably on these elements.

C. Human Subjects Research Statement (HSRS) Review

Applications being considered for funding after the Programmatic Review that involve human subjects research studies will have their HSRS reviewed prior to award. The local EPA Human Subjects Officer (HSO) will review the information provided in the HSRS and the Research Plan to determine if the ethical treatment of human subjects is described in a manner appropriate for the project to move forward. The HSO may consult with the EPA Human Subjects Research Review Official (HSRRO) as appropriate. The HSRRO may determine that an application cannot be funded if it is inconsistent with EPA’s regulations at 40 CFR Part 26.

D. Funding Decisions

Final funding decisions are made by the NCER Director based on the results of the peer review and the internal programmatic review and, where applicable, the assessment of the applicant’s human subjects research (see Section IV.C.5.c). In addition, in making the final funding decisions, the NCER Director may also consider program balance and available funds. Applicants selected for funding will be required to provide additional information listed below under “Award Notices.” The application will then be forwarded to EPA’s Grants and Interagency Agreement Management Division for award in accordance with the EPA’s procedures.

E. Additional Provisions for Applicants Incorporated into the Solicitation

Additional provisions that apply to this solicitation and/or awards made under this solicitation including the clause on Reporting and Use of Information Concerning Recipient Integrity and Performance can be found at EPA Solicitation Clauses. These, and the other provisions that can be found at the website link, are important, and applicants must review them when preparing proposals for this solicitation. If you are unable to access these provisions electronically at the website above, please communicate with the EPA contact listed in this solicitation to obtain *the provisions*.

VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices

Customarily, applicants are notified about evaluation decisions within six months of the solicitation closing date. A Peer Review Results document summarizing the scientific review will be provided to each applicant with an award or declination letter.

Applicants to be recommended for funding will be required to submit additional certifications and an electronic version of the revised project abstract. They may also be asked to provide responses to comments or suggestions offered by the peer reviewers and/or submit a revised budget. EPA Project Officers will contact the Lead PI/Contact PI to obtain these materials. Before or after an award, applicants may be required to provide additional quality assurance documentation.

The official notification of an award will be made by the Agency's Grants and Interagency Agreement Management Division. Applicants are cautioned that only a grants officer is authorized to bind the Government to the expenditure of funds; preliminary selection by the NCER Director in the Office of Research and Development does not guarantee an award will be made. For example, statutory authorization, funding, or other issues discovered during the award process may affect the ability of EPA to make an award to an applicant. The award notice, signed by an EPA grants officer, is the authorizing document and will be provided through electronic or postal mail.

B. Disputes

Disputes related to this assistance agreement competition will be resolved in accordance with the dispute resolution procedures set forth in 70 FR 3629, 3630 (January 26, 2005) which can be found at Dispute Resolution Procedures. Questions regarding disputes may be referred to the Eligibility Contact identified below.

C. Administrative and National Policy Requirements

Additional provisions that apply to this solicitation and/or awards made under this solicitation, including but not limited to those related to unique entity identifier, SAM, copyrights, disputes, and administrative capability, can be found at EPA Solicitation Clauses

These, and the other provisions that can be found at the website link, are important, and applicants must review them when preparing applications for this solicitation. If you are unable to access these provisions electronically at the website above, please communicate with the EPA contact listed in this solicitation to obtain the provisions.

Expectations and responsibilities of NCER grantees *and* cooperative agreement holders are summarized in this section, although the terms

grant and grantee are used.

1. **Meetings:** Principal Investigators will be expected to budget for, and participate in, All-Investigators Meetings (also known as progress reviews) approximately once per year with EPA scientists and other grantees to report on research activities and discuss issues of mutual interest.

2. **Approval of Changes after Award:** Prior written approval of changes may be required from EPA. Examples of these changes are contained in 2 CFR 200.308. Note: prior written approval is also required from the EPA Award Official for incurring costs more than 90 calendar days prior to award.

3. **Human Subjects:** A grant applicant must agree to comply with all applicable provisions of EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). In addition, grant applicants must agree to comply with EPA's procedures for oversight of the recipient's compliance with 40 CFR Part 26, as given in EPA Order 1000.17A (Policy and Procedures on Protection of Human Research Subjects in EPA Conducted or Supported Research). As per this Order, no human subject may be involved in any research conducted under this assistance agreement, including recruitment, until the research has been approved or determined to be exempt by the EPA Human Subjects Research Review Official (HSRRO) after review of the approval or exemption determination of the Institutional Review Board(s) (IRB(s)) with jurisdiction over the research under 40 CFR Part 26. Following the initial approvals indicated above, the recipient must, as part of the annual report(s), provide evidence of continuing review and approval of the research by the IRB(s) with jurisdiction, as required by 40 CFR 26.109(e).

   Guidance and training for investigators conducting EPA-funded research involving human subjects may be obtained here:

   Basic Information about Human Subjects Research
   Basic EPA Policy for Protection of Subjects in Human Research Conducted or Supported by EPA

4. **Data Access and Information Release:** After award, all data first produced under the award must be made available to the NCER Project Officer without restriction and be accompanied by comprehensive metadata documentation adequate for specialists and non-specialists alike to be able to understand how and where the data were obtained and to evaluate the quality of the data. If requested, the data products and their metadata must be provided to the NCER Project Officer in a standard exchange format no later than the due date of the grant's final report or the publication of the data product's associated results, whichever comes first.

   Congress, through OMB, has instructed each federal agency to implement Information Quality Guidelines designed to "provide policy and procedural guidance...for ensuring and maximizing the quality, objectivity, utility, and integrity of information, including statistical information, disseminated by Federal agencies." The EPA's implementation may be found at Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency. These procedures may apply to data generated by grant recipients if those data are disseminated as described in the Guidelines.

5. **Reporting:**

   A grant recipient must agree to provide annual performance progress reports, with associated summaries, and a final report with an executive summary. The summaries will be posted on EPA's Research Grants website. The reports and summaries should be submitted electronically to the Technical Contact named in Section VII of this announcement.

   A grant recipient must agree to provide copies of, or acceptable alternate access to (e.g., web link), any peer reviewed journal article(s) resulting from the research during the project period. In addition, the recipient should notify the NCER Project Officer of any papers published after completion of the grant that were based on research supported by the grant. NCER posts references to all publications resulting from a grant on EPA's Research Grants website.

6. **Acknowledgement of EPA Support:** EPA's full or partial support must be acknowledged in journal articles, oral or poster presentations, news releases, interviews with reporters and other communications. Any documents developed under this agreement that are intended for distribution to the public or inclusion in a scientific, technical, or other journal shall include the following statement:

   This publication [article] was developed under Assistance Agreement No._____ awarded by the U.S. Environmental Protection Agency to [*name of recipient*]. It has not been formally reviewed by EPA. The views expressed in this document are solely those of [*name of recipient or names of authors*] and do not necessarily reflect those of the Agency. EPA does not endorse any products or commercial services mentioned in this publication.

VII. AGENCY CONTACTS

Technical Contact: Michael Hiscock (hiscock.michael@epa.gov); phone: 202-564-4453
Eligibility Contact: Ron Josephson (josephson.ron@epa.gov); phone: 202-564-7823
Electronic Submissions: Debra M. Jones (jones.debram@epa.gov); phone: 202-564-7839

Contact Us to ask a question, provide feedback, or report a problem.

Contracting

Grants

January 19, 2017 Web Snapshot

No FEAR Act Data

Privacy

Privacy and Security Notice

Newsroom

Open Government

Regulations.gov

Subscribe

USA.gov

White House

Frequent Questions

Follow.

LAST UPDATED ON JUNE 27, 2017