Notice of Funding Opportunity

Applications Due: January 20, 2027

Office of the Administrator

Addressing Uncertainties in the Evidence for Health Effects of Lower Air Pollution Exposures

Funding Opportunity Number: **EPA-OA-OASES-26-10**

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1. Basic Information

U.S. Environmental Protection Agency

Office of the Administrator, Office of Applied Science and Environmental Solutions (OASES)

Addressing Uncertainties in the Evidence for Health Effects of Lower Air Pollution Exposures

EPA Research Funding Opportunities

A. Executive Summary

The U.S. Environmental Protection Agency (EPA) is announcing this Science to Achieve Results (STAR) Notice of Funding Opportunity (NOFO) to support research that will address substantial scientific uncertainty on the human health effects associated with exposures to typical U.S. ambient air pollutant concentrations. EPA is particularly interested in experimental and quasi-experimental research designs examining the potential health effects of exposure to ambient fine particulate matter ($PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2). While observational epidemiologic studies have reported associations between exposure to $PM_{2.5}$, ozone, and NO_2 and serious health outcomes, including associations at concentrations near and below the current National Ambient Air Quality Standards (NAAQS), very few experimental studies have evaluated the potential for health effects associated with lower pollutant exposures. Specifically, this funding opportunity seeks research that focuses on using experimental or quasi-experimental study designs (e.g., application of causal inference methods in accountability and intervention studies, controlled human exposure studies) to reduce uncertainty regarding the potential for human health effects, including in higher risk populations, from exposures likely to occur under recent U.S. air quality conditions, including in locations that meet the current NAAQS.

B. Key Information:

Opportunity Number:

EPA-OA-OASES-26-10

Assistance Listing:

66.509

Announcement Type:

Initial

Funding Available:

$6,500,000

Number of Awards:

4

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. Human subjects research supported by EPA must comply with EPA Regulation 40 CFR Part 26 - Protection of Human Subjects, including specific subparts B, C, and D, which prohibits research involving intentional exposure of human subjects who are children, pregnant women, or nursing women (subpart B) and requires additional protections in observational studies for pregnant women and fetuses (subpart C) and children (subpart D); see Section 4.B.1.e for additional information regarding human subjects research.

Eligible applicants include U.S.-based public and private nonprofit institutions, institutions of higher education, state, local, territorial, and federally recognized Tribal governments and organizations. See Section 2 for additional information on eligibility.

C. Key Dates:

January 20, 2027, 11:59 pm ET	Application Submission Deadline
June 2027	Anticipated Notification of Selection
August 2027	Anticipated Award Notification

D. Funding Details:

It is anticipated that up to **4 awards** will be made under this announcement. The amount of funding is expected to be **$6,500,000**, depending on Agency funding levels, the quality of applications received, agency priorities, and other applicable considerations. Awards under this opportunity are expected to be funded up to $1,625,000 over project periods of **3 years** or fewer.

E. Agency Contact Information:

Further information, if needed, may be obtained from the EPA contact(s) indicated below.

Technical Contact:	Serena Chung; 202-564-6069; chung.serena@epa.gov
Eligibility Contact:	Serena Chung; 202-564-6069; chung.serena@epa.gov
Electronic Submissions Contact:	electronic-grant-submissions@epa.gov

2. Eligibility

A. Eligible Applicants

Only these types of organizations may apply:

- Federally Recognized Indian Tribes.
- State & Local Governments.
- Institutions of Higher Education (IHEs).
- Nonprofit organizations.

Non-domestic (non-U.S.) entities are not eligible to apply.

Federal Agencies may not apply. Federal employees are not eligible to serve in a principal leadership role on an assistance agreement. Federal employees may not receive salaries or augment their Agency's appropriations through awards made under this program unless authorized by law to receive such funding.

(1) Other Eligibility Requirements

Applications must meet the following threshold criteria to be considered eligible:

- Applications must not request more than **$1,625,000.**
- Project periods must be 3 years or fewer.
- Applications must demonstrate that the proposed research is relevant to the EPA's priorities as described in the FY 2026–2030 EPA Strategic Plan Goal 1: Clean Air, Land, and Water for Every American; Objective 1.1 Healthy Air Quality: Reduce Air Pollutants, Enhance Ambient and Indoor Air Quality, Lower Radiation Exposure, and Respond to Air-Quality Emergencies.

- Applications must identify at least one research area listed in Section 3.A. that they address in their proposal.

Applications that do not meet the above requirements are ineligible and will not be reviewed. Please see Section 6.A for additional threshold criteria. Potential applicants who are uncertain of their eligibility should contact the Eligibility Contact listed under Section 1.E *Agency Contact Information*.

B. Cost Sharing

Cost sharing is not a requirement to be eligible to apply for this funding opportunity. Please note only Federal funds should be listed on the SF-424, SF-424A, and Budget Detail.

3. Program Description

A. Purpose, Priorities, and Activities

For this funding opportunity, EPA is interested in supporting research investigations using experimental and quasi-experimental study designs (e.g., application of causal inference methods in accountability and intervention studies, controlled human exposure studies) into health effects associated with exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet the current National Ambient Air Quality Standards (NAAQS). EPA is specifically interested in studies examining exposure to particulate matter ($PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2) at levels relevant to recent U.S air quality conditions, including studies that employ experimental designs (e.g., controlled exposures or interventions), evaluate causal interference in epidemiologic analysis, provide insights into the biological mechanisms underlying health outcomes, reduce uncertainty in exposure-response functions at concentrations at or near the current health-based NAAQS, and characterize how health outcomes may vary across populations, especially for at-risk populations (e.g., children, older adults, pregnant women, people with preexisting conditions, etc.) that may be more susceptible or vulnerable to health effects at lower concentrations.

Background

In recent decades, air quality in the U.S. has improved substantially as a result of the implementation of the Clean Air Act (CAA) (Our Nation's Air). Under the CAA the EPA is required to set NAAQS for six criteria pollutants that are reasonably expected to present a danger to public health or welfare. The NAAQS are defined by four elements: the indicator (chemical species or mixture), averaging time (e.g., annual average or 8-hour maximum), form (statistical computation), and level (concentration). Together, these elements are used to calculate design values, the metrics used to determine whether an area meets the NAAQS (U.S. Environmental Protection Agency, 2024; Air Quality Design Values).

$PM_{2.5,}$ ozone, and NO_2 are criteria pollutants with extensive evidence linking exposure to various adverse health effects. The health effects can affect everyone, but certain populations and lifestages are at higher risk, such as children, older adults, and individuals with preexisting conditions. For example, children are uniquely vulnerable to the health effects of air pollution for a variety of reasons. Children breathe more air per body weight, spend more time outdoors, and have developing lungs and smaller airways that are more susceptible to inflammation. In addition, exposures during early lifestages, including prenatal and childhood periods, may have cumulative effects that persist over a lifetime. Reducing uncertainties regarding the nature of health effects linked to $PM_{2.5}$, ozone, and NO_2, including subclinical changes, for exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet

the current NAAQS, can help inform health risk communications and clinical or public health interventions, as well as support state, local, and Tribal agencies and communities in addressing their air quality concerns.

While the evidence linking adverse health effects to $PM_{2.5}$, ozone, and NO_2 exposures is extensive, substantial uncertainty remains regarding the health effects at exposure levels typical of recent air quality conditions in the U.S., including in locations that meet the current standards. Some observational epidemiologic studies on $PM_{2.5}$ and NO_2 have reported associations with health effects at relatively low air pollutant concentrations, including concentrations near or below the current standards (U.S. Environmental Protection Agency, 2022; U.S. Environmental Protection Agency, 2026). In contrast, the ozone epidemiologic evidence is much more limited for relatively low air pollutant concentrations. Among the 42 U.S. and Canadian epidemiologic studies included in the 2020 Ozone Integrated Science Assessment that reported a statistically significant association of short- or long-term ozone concentrations with respiratory outcomes, the vast majority were in locations and time periods that would not have met the current ozone standard (U.S. Environmental Protection Agency 2023).

Experimental studies have not kept pace with recent epidemiologic studies at low concentrations. Experimental results are critical in a weight-of-evidence approach for determining causal relationships between exposure and health effects, assessing the biological plausibility of causal relationships, and understanding biological mechanisms by which an air pollutant may cause effects (National Academies of Sciences, Engineering, and Medicine, 2022). Controlled human exposure studies are also useful for informing exposure-response functions (e.g., Orach et al., 2020, Section 3D.2.8.2.1 of U.S. Environmental Protection Agency 2023), which are important because they indicate whether health risks persist at lower pollution levels and are used for risk assessment. Controlled human exposure studies have generally been conducted at concentrations that are well above the ambient concentrations typically observed in locations that meet the current standards. A limited number of controlled human exposure studies reporting health outcomes at lower exposure levels have provided some insights; however, these studies typically expose participants under conditions that do not reflect the exposure conditions relevant to recent air quality conditions in the U.S. and U.S. populations (e.g., 6+ hours of exposure during exercise), making generalization from controlled human exposure studies to the broader U.S. population more uncertain.

Traditional observational epidemiologic studies that report associations between exposure and health outcomes are subject to substantial uncertainties related to exposure measurement errors, confounding, and other factors. In addition, causal inference is limited because researchers cannot experimentally control exposure in the same way as in a randomized controlled trial. Compared to traditional observational epidemiologic studies, quasi-experimental designs can provide stronger evidence of causality between air pollution exposure and health effects. They take advantage of "natural experiments" in which policies or natural events cause random or quasi-random changes in air pollution exposure. By taking advantage of these changes that are driven by external events or policies and are not influenced by individual choices, quasi-experimental designs are less susceptible to sources of bias, particularly confounding. Quasi-experimental designs are often paired with causal inference methods, statistical techniques designed to infer causation rather than correlation, in accountability studies that evaluate the impacts of regulations or other policy interventions. Examples of accountability studies include studies on health impacts of vehicle regulations (e.g., Willis et al., 2020), coal coke plant closure (e.g., Yu and Thurston, 2025), and driving and construction restrictions during the 2008 Beijing Olympics (e.g., Rich et al., 2012), to name a few. These studies have been useful in informing how policy-driven air quality improvements have impacted public health; however, they often relied on historical data or data from outside the U.S. that may not reflect current U.S. air quality conditions. Application of causal

inference methods in quasi-experimental designs for pollutant exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet the current standards, could help address an important gap in the scientific literature.

For large-scale epidemiologic studies, as methods to estimate exposure have evolved from assigning exposure based on nearby air monitors to more sophisticated modeling methods, exposure measurement error remains an important uncertainty. Estimates of ambient concentration derived from various combinations of monitoring networks, land use regression models, chemical transport models, and satellite-based products may be imperfect proxies for individual-level exposure. Significant efforts have gone into validation of estimates of ambient concentrations, but an inherent limitation is the sparseness of monitoring sites from which data can be used for validation, especially in rural locations. In addition, exposure can vary across space, time, and behavior patterns, and exposures within indoor or other microenvironments are difficult to capture in large-population studies. When ambient concentrations are low, higher exposures indoors may obscure observed health effects attributable to ambient pollution.

Uncertainties remain related to how repeated or intermittent short-term exposures to high air pollutant levels might contribute to health effects. High exposure levels are common during wildfire smoke events but may also occur at other times. A location may experience high exposure events but still meet the NAAQS, which are based on statistics of average concentrations as defined by the four elements for each NAAQS (e.g., the ozone NAAQS is the annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years). For example, an area can be in attainment of both the annual and 24-hr $PM_{2.5}$ NAAQS but could still experience sub-daily concentrations above the 24-hr threshold of 35 $\mu g/m^3$ (U.S. Environmental Protection Agency, 2024; Air Quality Design Values). Studies evaluating high-intensity events could help address a number of research and data gaps, including the impact of short-term exposures (single-day versus multiple-day exposures) on short-term health impacts; short-term exposures (multi-episode peak periods over a year) on long-term health impacts; and cumulative short-term exposures combined with more typical long-term exposures and long-term health outcomes.

The purpose of this funding opportunity is to solicit research that will address the uncertainties described above and other related research gaps regarding the nature of health effects linked to $PM_{2.5}$, ozone, and NO_2 for exposures likely to occur under recent air quality conditions in the U.S. Of specific interest are studies that use experimental and quasi-experimental designs. Results from the research should help inform health risk communications and clinical or public health interventions, as well as support state, local, and Tribal agencies and communities in addressing their air quality concerns.

Specific Research Areas of Interest

For this funding opportunity, EPA is interested in supporting research that uses experimental and quasi-experimental study designs to examine the potential for human health effects, particularly in at-risk populations, associated with pollutant exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet the current standards. EPA is specifically interested in studies examining exposure to particulate matter ($PM_{2.5}$), ozone (O_3), or nitrogen dioxide (NO_2). Proposed research may employ any number of approaches, including controlled human exposure, panel, small clinical, and epidemiologic studies. Applications proposing panel or epidemiologic studies should use experimental designs (e.g., indoor filtration in a panel study) or quasi-experimental designs (e.g., natural experiment).

Applications in response to this funding opportunity should address at least one of the following research areas:

1. The application of causal inference methods in quasi-experimental designs (e.g., accountability and intervention studies) to evaluate health effects associated with exposure to $PM_{2.5}$, ozone, or NO_2 concentrations at or below the NAAQS, including in populations identified as at-risk populations.

2. The use of experimental or quasi-experimental studies to reduce uncertainty in the shape of the exposure-response relationship near and below the current level of the NAAQS, including for at-risk populations.

3. The application of existing or new innovative exposure study designs in epidemiologic studies to evaluate the association between exposures and health outcomes at ambient concentrations near and below the current NAAQS. This may include ways to use new data to account for exposure variation across space, time, behavior patterns, and microenvironments.

4. Experimental studies that can reduce uncertainties related to biological plausibility and mechanisms of health effects at exposure concentrations at or below the current NAAQS and for exposure patterns relevant to U.S. populations. This should consider which biomarkers or physiological endpoints are most sensitive and how they can inform the biological pathways of physiologic impairment or disease progression at low exposure levels in healthy and at-risk populations.

5. Research to examine how a single versus repeated shorter-term exposure (days to weeks) to peak concentrations affect health outcomes. This should include examination of how the temporal pattern of exposure affects health outcomes from air pollution exposures in locations that meet the current NAAQS. For example, does exposure to short-term, high-concentration pollution events lead to worse or different health outcomes than exposure to lower concentration pollution events, even when the total long-term (e.g., annual) average exposure concentrations are the same?

Note on Humans Subjects Research

This funding announcement 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 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 as described in Section 4.B.1.e of this notice of funding opportunity, and if the project involves human subjects research, it will be subject to an additional level of review after selection decisions are made as described in Section 8 *Post-Award Requirements and Administration* of this solicitation.

Expected Outputs and Outcomes

EPA requires that grant applicants adequately describe environmental outputs and outcomes to be achieved under assistance agreements (see EPA Order 5700.7A1, Environmental Results under Assistance Agreements). Applicants should include specific statements in their applications describing the environmental results of the proposed project in terms of well-defined outputs and, to the maximum

extent practicable, well-defined outcomes that will demonstrate how the project will contribute to the goal(s) and objective(s) described below in Section 3.B. Applicants should describe an approach for tracking and reporting progress toward achieving the expected project outputs and outcomes in their applications.

Expected Outcomes

The goal of this funding opportunity is to increase knowledge and understanding, and subsequently reduce important uncertainties, related to potential human health effects associated with $PM_{2.5,}$ ozone, and NO_2 exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet the current NAAQS. Specific outcomes that support this goal may include, but are not limited to:

- Experimental and quasi-experimental data (e.g., from application of causal inference methods in accountability and intervention studies, controlled human exposure studies) on health outcomes associated with exposure to recent air pollution levels in the U.S., including in locations that meet the current NAAQS
- Experimental and quasi-experimental data that could inform the exposure-response relationship of air pollution health effects at low ambient concentrations (e.g., exposures likely to occur under recent air quality conditions in the U.S., including in locations that meet the current standards)
- Insights into how one-time versus repeated short-term peak air pollution exposures in locations that meet the NAAQS might influence health outcomes
- Insights into the biological mechanisms underlying health outcomes associated with $PM_{2.5}$, ozone, and NO_2 with a focus on levels at or below the NAAQS
- Characterization of how different at-risk populations experience health effects associated with air pollution levels at or below the NAAQS

Expected Outputs

Expected outputs should include reports, presentations, and peer-reviewed journal publications documenting the scientific basis of the outcomes and other outputs of the research. Other outputs may include, but are not limited to:

- Data sets on health outcomes and exposure to air pollution levels typical of recent U.S. air quality conditions, including in locations that meet the current NAAQS, using novel experimental methods (e.g., causal inference in quasi-experimental study designs, human controlled exposure studies)
- Exposure-response functions for exposures typical of recent U.S. air quality conditions, including in locations that meet the current NAAQS, based on controlled human exposure studies or studies using quasi-experimental designs
- New innovative methods or approaches for investigating the relationship between health outcomes and air pollution exposure at levels near or below the current NAAQS
- Free and open-source analysis tools for improved exposure assessment and validation for epidemiologic studies

B. Program Goals and Objectives

The activities to be funded under this funding announcement support Goal 1: Clean Air, Land, and Water for Every American; Objective 1.1 Healthy Air Quality: Reduce Air Pollutants, Enhance Ambient and

Indoor Air Quality, Lower Radiation Exposure, and Respond to Air-Quality Emergencies of the FY 2026–2030 EPA Strategic Plan.

Award(s) made under this announcement will further EPA's priorities of ensuring clean air for every American (Goal 1) by promoting high-priority research on health effects of air pollution.

The proposed research awards support the STAR Program's goal of stimulating and supporting scientific and engineering research that advances EPA's mission to protect human health and the environment in the area of air quality by supporting research investigations into the potential health effects associated with exposure to ambient air pollution at concentrations typical of areas that meet the current air quality standards.

C. Statutory Authority

The authority for this NOFO and resulting awards is contained in Section 103(b)(3) of the Clean Air Act, 42 U.S.C. § 7403; and the Consolidated Appropriations Act, 2026, Public Law 119-75.

For research with an international aspect, the above statutes are supplemented, as appropriate, by the National Environmental Policy Act, Section 102(2)(I), 42 U.S.C. § 4332(2)(I). 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.

D. Funding Type

It is anticipated that grants will be funded under this funding opportunity.

E. Requirements for Increasing Access to Results of EPA-Funded Extramural Scientific Research

It is EPA Policy to ensure that the results of EPA-funded extramural scientific research are accessible to the public to the greatest extent feasible consistent with applicable law; policies and Orders; the Agency's mission; resource constraints; and U.S. national, homeland and economic security. This entails maximizing, at no charge, access by the public to peer-reviewed, scientific research journal publications or associated author manuscripts, and their underlying digital research data, created in whole or in part with EPA funds, while protecting personal privacy; recognizing proprietary interests, confidential business information and intellectual property rights; and avoiding significant negative impact on intellectual property rights, innovation, and U.S. competitiveness. EPA's Policy for Increasing Access to Results of EPA-Funded Extramural Scientific Research may be accessed at: Non-EPA Researcher Requirements. Applications submitted under this funding opportunity shall include a Scientific Data Management Plan (SDMP) that addresses public access to EPA-funded scientific research data. See the SDMP clause in Section 4 for details on the content of an SDMP. These items will be evaluated prior to award.

Reasonable, necessary, and allocable costs for data management and public access as discussed in EPA's Policy for Increasing Access to Results of EPA-Funded Extramural Scientific Research may be included in extramural research applications and detailed in the budget justification described in Section 4 or as otherwise directed.

4. Application Contents and Format

A. Application Forms

The following forms and documents are required under this announcement:

Mandatory Documents:

- Application for Federal Assistance (SF-424)
- Budget Information for Non-Construction Programs (SF-424A)
- EPA Key Contacts Form
- EPA Form 4700-4 Preaward Compliance Review Report (see Tips for Completing EPA Form 4700-4 at https://www.epa.gov/grants/tips-completing-epa-form-4700-4)
- Project Narrative Attachment Form: use this to submit your Project Narrative as described in Section 4.B.

Optional Documents:

- Other Attachments Form – use this to upload the Additional Key Contacts Form (see additional instructions below) and the applicant organization's Negotiated Indirect Cost Rate Agreement (NICRA), if there is one.

  Additional Key Contacts Form Instructions

  An "Additional Key Contacts" form is available at this link: https://www.epa.gov/system/files/documents/2021-08/epa_form_5700_54-2.pdf. The Additional Key Contacts form must be completed when additional entries are needed. It must be completed for subawards (i.e., principal 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 4.D. *Other Program Specific Application Information 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 EPA Key Contacts Form as the Project Manager/Principal Investigator. Note: the term Project Manager is used on the EPA Key Contacts form. The term Principal Investigator is used on the Additional Key Contacts form. For additional PIs, complete the Major Co-Investigator fields and identify PI status next to the name (e.g., "Name: John Smith, Principal Investigator").

  If you need to submit the Additional Key Contacts form, you must submit it using the Other Attachments Form.

  Negotiated Indirect Cost Rate Agreement (NICRA)

  If there is one, the applicant organization's NICRA should be included in Other Attachments Form.

Important Note: Only download or fill out the other required forms in your Grants.gov Workspace. If you try to download these forms from websites other than your Grants.gov Workspace, you may encounter errors when submitting your application in Grants.gov. Only the Additional Key Contacts form, which will be uploaded using the Other Attachments Form, may be downloaded from outside of your Grants.gov Workspace.

Applicants are advised that readability is of paramount importance and should take precedence in application format, including selecting a legible font type and size for use in the application.

B. Project Narrative Description

See Instructions on Application Content Below

1. **Project Narrative**

Submit your project narrative using the Project Narrative Attachment Form and to be prepared as described below. Note: The number of pages allotted to each section denotes the maximum number of pages to be submitted for that section. Additional instruction on page requirements, as applicable, is included within each section. Applicants should ensure they are addressing the Technical Merit Criteria listed in Section 6.B when preparing their Project Narrative.

a. Table of Contents

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

b. 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. Note: Do not include confidential, privileged, or sensitive information and do not include trade secrets or commercial or financial information that is confidential or privileged, or sensitive information that would invade another individual's personal privacy (e.g., an individual's salary, personal email addresses, etc.).

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

i. Notice of Funding Opportunity Title: Addressing Uncertainties in the Evidence for Health Effects of Lower Air Pollution
Funding Opportunity Number: EPA-OA-OASES-26-10.

ii. 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."

iii. Investigators: For applications with multiple investigators, state whether this is a single Lead PI (with co-PIs) or Multiple PI application (see Section 4.D). 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.

iv. Universities and 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.

v. 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.

vi. Project Cost: Show the total funding requested from the EPA (include direct and indirect costs for all years).

vii. 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 this solicitation, including the estimated improvement in risk assessment or risk management that will result from successful completion of the proposed work.

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

c. Research Plan (15 pages)

Applications should focus on a limited number of research objectives that adequately and clearly demonstrate that they meet the funding opportunity's 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 technical merit reviewers. Research Plan should be composed of addressing the Review Criteria stated in Section 6.B of this NOFO.

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 on page size, point type and margins 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 application.

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, how it supports the Agency's research priorities and how it fulfills the requirements of this 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 this 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) 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. Include an approach for tracking and reporting your progress toward achieving the expected project outputs and outcomes. A clear, concise description will help technical merit reviewers understand the merits of the research.

(4) 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. If applicable, provide resources available to specific senior/key person(s), such as additional research space or personnel and in-kind contributions with an estimated dollar value of $5,000 or more that support the research activity for use on the project/application being proposed. If applicable, also provide information on postdoctoral scholars, students, or visiting scholars who are supported by an external entity, and whose research activities are intended for use on the project/application being proposed. 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 managers and the functions of each investigator in each team and describe plans to communicate and share data.

(5) Appendices may be included but must remain within the 15-page limit.

d. Quality Assurance Statement (QAS) (3 pages)

A QAS is required for projects involving collection or processing of environmental information, sampling and analysis, conducting surveys, modeling, method development, or the development of environmental technology (whether hardware-based or via new techniques). The QAS should discuss 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 EPA quality assurance standards. Additional QA requirements apply after award and are included in the terms and conditions of the assistance agreement.

Address each section below by including the required information or explaining why the section does not apply to the proposed research. Applicants may be asked to provide additional information for incomplete responses.

(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 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.

(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 sections (3)(a) and/or (3)(b) 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 sections (3)(a) and/or (3)(b) 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 sections (3)(a) and/or (3)(b) 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 sections (3)(a) and/or (3)(b) 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., daily activity record-keeping procedures, data verification and validation procedures).

Applicants should contact the Technical Contact listed under Section 1.E *Agency Contact Information* regarding questions pertaining to Quality Assurance.

e. 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 Part 26 than in the more commonly cited 45 CFR Part 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. 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 Part 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 1000.17A. These include review of projects for EPA-supported human research by the EPA Human Subjects Research Review Official (HSRRO). Additional requirements must be met and final approval must be received from the HSRRO before the human subjects' portion of the research can begin. When reviewing human observational exposure studies, EPA Order 1000.17A requires the HSRRO to apply the principles described in the SEAOES document and grant approval only to studies that adhere to those principles.

All applications submitted under this solicitation should 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: Protection of Human Subjects.

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 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. (It is likely that not all will apply). Please note that even research that has been determined to be exempt from the human subjects regulations by an IRB (or other human subject research official at the institution) 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 (also known as Federal Wide Assurance [FWA]) 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, the EPA will work with investigators to obtain an assurance from HHS or another source.

Address all items below for studies involving human subjects.

Protection of Human Subjects

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 subject's 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 40 CFR Part 26, Protections of Human Subjects, Subparts B-D, must include additional protections. Refer to the EPA guidance and regulations, including Basic Information about Human Subjects Research, and Protection of Human Subjects

Part B - Prohibition of Research Conducted or Supported by EPA Involving Intentional Exposure of Human Subjects who are Children or Pregnant or Nursing Women

Part C – Observational Research: Additional Protections for Pregnant Women and Fetuses Involved as Subjects in Observational Research Conducted or Supported by EPA

Part D – Observational Research: Additional Protections for Children Involved as Subjects in Observational Research Conducted or Supported by EPA

• 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 Data and Safety Monitoring Board (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.

f. Scientific Data Management Plan (2 pages)

Applications submitted in response to this solicitation should include a Scientific Data Management Plan (SDMP) that addresses public access to EPA-funded scientific research data by including the information below:

(1) If the proposed research described in the application is expected to result in the generation of scientific research data, the application should include a Scientific Data Management Plan (SDMP) of up to two single-spaced pages (this is in addition to any application page limits described in Section 4 of this solicitation that apply to other parts of the application package) describing plans for providing long-term preservation of, and public access to, the scientific research data and accompanying metadata created and/or collected under the award (including data generated under subawards and contracts) funded in whole or in part by the EPA. The SDMP should indicate that recipients will make accessible, at a minimum, scientific research data and associated metadata underlying their scientific research journal publications funded in whole or in part by the EPA. SDMPs should reflect relevant standards and community best practices for data and metadata and make use of community-accepted repositories whenever practicable. The contents of the SDMP (or absence thereof) will be considered as part of the application review process for selected applicants as described in Section 6 and must be deemed acceptable for the applicant to receive an award. The SDMP should include the following elements (Note: If any of the items listed below do not apply, please explain why):

i. Types of scientific research data and metadata expected to be generated and/or collected under the award.
ii. The location where the data will be publicly accessible.
iii. The standards to be used for data/metadata format and content.
iv. Policies for accessing and sharing data including provisions for appropriate protection of privacy, security, intellectual property, and other rights or requirements consistent with applicable laws, regulations, rules, and policies.
v. Plans for digital data storage, archiving, and long-term preservation that address the relative value of long-term preservation and access along with the associated costs and administrative burden.
vi. Description of how data accessibility and preservation will enable validation of published results or how such results could be validated if data are not shared or preserved.
vii. Roles and responsibilities for ensuring SDMP implementation and management (including contingency plans in case key personnel leave the project).

viii. Resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research application that are needed to meet the stated goals for accessibility and preservation (reference can be made to the relevant section of the research application's budget justification).
ix. If appropriate, an explanation as to why data accessibility and/or preservation are not possible.

(2) If the proposed research is not expected to result in the generation of scientific research data, provide the following statement (not subject to any application page limits described in Section 4 of this solicitation) in your application as the SDMP: "The proposed research is not expected to result in the generation of scientific research data." If scientific research data are generated after award, the recipient agrees to update the statement by providing the EPA with a revised SDMP (see content of SDMP described above) describing how scientific research data and accompanying metadata created and/or collected under the award (including data generated under subawards and contracts) will be preserved and, as appropriate, made publicly accessible.

Evaluation of the Scientific Data Management Plan

EPA will evaluate the merits of the SDMPs for those applications recommended for award. The SDMPs for those applications not recommended for award will not be reviewed. The SDMPs of all applications recommended for award will be evaluated to ensure they are appropriate and adequate (e.g., that they describe the types of scientific research data and metadata to be collected and/or generated under the proposed research award and include plans for providing long-term preservation of, and public access to, the scientific research data and metadata). SDMPs that indicate the proposed research will not result in the generation and/or collection of scientific research data will also be evaluated to ensure the proposed research will not result in the generation and/or collection of scientific research data and therefore not require a more comprehensive SDMP. Applicants may be contacted regarding their SDMP if additional information is needed or if revisions are required prior to award. If upon review of the SDMP, EPA identifies any issues with the plan, EPA will raise these issues to the applicant, so they may be addressed. Applicants with an unsatisfactory SDMP will not receive an award.

g. Past Performance (3 pages)

Submit a list of federally funded assistance agreements (assistance agreements include federal grants and cooperative agreements but not federal contracts) pertaining to the proposed Lead PI (in the case of Multiple PI applications, the Contact PI) that are similar in size, scope and relevance to the proposed project active within the last **three** years (no more than five agreements, and preferably EPA agreements). The specific information required for each agreement is shown below. 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, please indicate this in your response.** If you do not have any relevant or available past performance or reporting information you will receive a neutral score (5 out of 10) for these factors. If you do not provide any response for these items, you may receive a score of 0 for these factors.

1. Name of Awarding Agency
2. Grant/Cooperative agreement number
3. Grant/Cooperative agreement title
4. Grantee Institution

5. Brief description of the grant/cooperative agreement
6. A discussion on whether the agreement was successfully managed and completed; if not successfully managed and completed, provide an explanation
7. 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 and meeting reporting requirements under the agreement. Include the history of submitting acceptable and 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
8. Information relating to whether journal publications or author manuscripts associated with the journal publications, and the associated underlying scientific research data and metadata, resulting from those agreements were made publicly accessible (and if not, explain why not; or explain why this requirement does not apply) to the extent permissible under applicable laws and regulations
9. Total (all years) grant/cooperative agreement dollar value
10. Project period
11. Technical contact (project officer), telephone number and Email address (if available)

In evaluating applicants under these factors in Section V, EPA will consider the information provided by the applicant and may also consider relevant information from other sources, including information from EPA files and from current/prior grantors (e.g., to verify and/or supplement the information provided by the applicant).

h. References

References to help augment the application may be included and will be excluded from cited page limit requirements (e.g., research plan, quality assurance statement).

i. Budget Justification (3 pages)

For information on preparing proposed work plans, budgets, and budget narratives for EPA assistance agreements, see EPA's Interim General Budget Development Guidance for Applicants and Recipients of EPA Financial Assistance. Identify the amount requested for each budget category and describe the basis for calculating the personnel, fringe benefits, travel, equipment, supplies, contractual support, and other costs identified in the SF-424A. Regarding travel, if EPA funds will 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. 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.

Participant support costs issued to program beneficiaries/program participants must be included under "Other" in the budget forms. 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.

j. Resumes (2 pages Per Resume)

Provide resumes for each senior/key person[1]. Senior/key persons typically do not include undergraduate and graduate students. The resume is not limited to traditional materials but should provide materials to clearly and appropriately demonstrate that the senior/key person has the knowledge needed to perform their component of the proposed research. The resume for each senior/key person must not exceed two consecutively numbered (bottom center), 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins.

In addition to professional preparation (e.g., education and training), the resume should also include academic, professional or institutional appointments and positions, whether or not remuneration is received, and whether they are full-time, part-time, or voluntary. A list of products that demonstrate the individual's qualifications to carry out the project as proposed should also be included.

For a complete listing of what information needs to be disclosed, please see, **NSPM-33 Implementation Guidance Pre- and Post-award Disclosures Relating to the Biographical Sketch and Current and Pending (Other) Support** at NSPM-33 Implementation Guidance.

k. Current and Pending Support

Current and pending support information is used to assess the capacity of the individual to carry out the research as proposed and helps assess any potential scientific and budgetary overlap/duplication, as well as overcommitment with the project being proposed. Complete a Current and Pending Support form (https://www.epa.gov/system/files/documents/2021-08/ncer_form_5.pdf) for each senior/key person (see footnote 1). Senior/key persons typically do not include undergraduate and graduate students. Include all current and pending support regardless of source. Senior/key persons will certify that the information contained in their current and pending support form is current, accurate, and complete. For applications selected for funding, the EPA will require senior/key persons to update, as needed, their current and pending support disclosure prior to award and at any subsequent time the agency determines appropriate during the term of the award.

Current and pending research support means all resources made available, or expected to be made available, to an individual in support of the individual's research and development efforts, regardless of: (i) whether the source of the resource is foreign or domestic; (ii) whether the resource is made available through the entity applying for a research and development award or directly to the individual; or (iii) whether the resource has monetary value. Current and pending research support also includes in-kind contributions requiring a commitment of time and directly supporting the individual's research and development efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students.

Consistent with the Guidance for Implementing National Security Presidential Memorandum 33 (NSPM-33) on National Security Strategy for United States Government-Supported Research and Development, senior/key persons are required to disclose contracts associated with participation in programs sponsored by foreign governments, instrumentalities, or entities, including foreign government-

[1] Individual identified by the applicant and designated by the EPA who will contribute in a substantive, meaningful way to the scientific development or execution of a research and development project proposed to be carried out with a research and development award from a Federal research agency.

sponsored talent recruitment programs. Note that non-disclosure clauses associated with these contracts are not acceptable exemptions from this disclosure requirement.

Senior/key persons should disclose current or pending participation in, or applications to, programs sponsored by foreign governments, instrumentalities, or entities, including foreign government-sponsored talent recruitment programs.

Senior/key persons should disclose consulting activities when any of the following scenarios apply: (i) the consulting activity will require the senior/key person to perform research as part of the consulting activity; (ii) the consulting activity does not involve performing research, but is related to the senior/key person's research portfolio and may have the ability to impact funding, alter time or effort commitments, or otherwise impact scientific integrity; or (iii) the consulting entity has provided a contract that requires the senior/key person to conceal or withhold confidential financial or other ties between the senior/key person and the entity, irrespective of the duration of the engagement.

Senior/key persons should also disclose in-kind contributions with an estimated dollar value of $5,000 or more not intended for use on the project/application being proposed and have an associated time commitment; postdoctoral scholars, students, or visiting scholars who are supported by an external entity, whose research activities are not intended for use on the project/application being proposed and have an associated time commitment; travel supported/paid by an external entity to perform research activities with an associated time commitment; startup company based on non-organization-licensed IP; and startup packages from other than the proposing organization.

For a complete listing of what information needs to be disclosed, please see, **NSPM-33 Implementation Guidance Pre- and Post-award Disclosures Relating to the Biographical Sketch and Current and Pending (Other) Support** at NSPM-33 Implementation Guidance.

In accordance with Section 223(a)(1) of the *William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021* (42 U.S.C. § 6605(a)(1)), senior/key persons are required to certify that the information provided in their current and pending support form is current, accurate, and complete. Each senior/key person who provides a pending and support form must also provide a certification attesting that the information contained in the form is current, accurate, and complete. Senior/key persons should add the certification as an additional page to their current and pending support form.

False representations may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

Applicants requiring multiple Current and Pending Support Form pages should use multiple forms and develop a single document. Multiple forms can also be attached.

l. Applicant Current and Pending Support Certification (1 Page)

The applicant's Authorized Organization Representative (AOR) is required to provide a certification that each individual employed by the organization and identified on the application as a senior/key person has been made aware of the certification requirements identified in the *William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021,* Section 223(a)(1) (42 U.S.C. § 6605(a)(1)).

False representations may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

m. 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. 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 application. 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 at EPA Solicitation Clauses.

By submitting an application in response to this solicitation, the applicant grants the EPA permission to make limited disclosures of the application to technical merit 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 including the Freedom of Information Act, 5 U.S.C. § 552; information from a successful application may be publicly disclosed to the extent permitted by law.

C. Applicants Using Contractors

Applicants must compete contracts for services and products, including consultant contracts, and conduct cost and price analyses, to the extent required by the procurement provisions of the regulations at 2 CFR Part 200.

Do not name a procurement contractor (including a consultant) as a “partner” or otherwise in your application unless the contractor has been selected in compliance with competitive procurement requirements. If an applicant selected for award has named a specific subrecipient, contractor, or consultant in the application, it does not relieve the applicant of its obligations to comply with subaward and/or competitive procurement requirements.

The EPA will not consider the qualifications, experience, and expertise of named subrecipients and/or named contractor(s) during the application evaluation process unless the applicant provides documentation that it has complied with these requirements.

For additional guidance, applicants should review EPA’s Best Practice Guide for Procuring Services, Supplies, and Equipment Under EPA Assistance Agreements, EPA’s Subaward Policy, and EPA’s Subaward Policy Frequent Questions. The EPA expects recipients of funding to comply with competitive procurement contracting requirements in 2 CFR Parts 200 and 1500and 40 CFR Part 33 Subpart C.

D. Other Program Specific Application Information

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 Section 4 of this funding opportunity notice. For further information, please see the EPA Implementation Plan for Policy on Multiple Principal Investigators (Research Grants Guidance and Policies).

This funding opportunity provides the opportunity for the submission of applications for projects that may involve human subjects research. All applications should include a Human Subjects Research Statement (HSRS; described in Section 4.B *Project Narrative Description* of this solicitation). If the project involves human subjects research, it will be subject to an additional level of review after selection decisions are made as described in Section 8 *Post-Award Requirements and Administration* of this solicitation.

Scientific Data Management Plan (SDMP)
The EPA will evaluate the merits of the SDMPs for those applications recommended for award. The SDMPs for those applications not recommended for award will not be reviewed. The SDMPs of all applications recommended for award will be evaluated to ensure they are appropriate and adequate (e.g., describe the types of scientific research data and metadata to be collected and/or generated under the proposed research award and include plans for providing long-term preservation of, and public access to, the scientific research data and metadata). SDMPs that indicate the proposed research will not result in the generation and/or collection of scientific research data will also be evaluated to ensure the proposed research will not result in the generation and/or collection of scientific research data and therefore not require a more comprehensive SDMP. Applicants may be contacted regarding their SDMP if additional information is needed or if revisions are required prior to award. If upon review of the SDMP, EPA identifies any issues with the plan, EPA will raise these issues to the applicant, so they may be addressed. Applicants with an unsatisfactory SDMP will not receive an award.

5. Submission Requirements and Deadlines

A. Submission Dates and Times

January 20, 2027, 11:59 pm ET Application Submission Deadline

Grants.gov creates a date and time record when it receives the application. If you submit the same application more than once, we will accept the last on-time submission.

B. Unique Entity Identifier (UEI) and System for Award Management (SAM.gov)

SAM.gov

You must have an active account with SAM.gov. SAM.gov will provide a UEI for your organization, which is required to apply for grants using Grants.gov. To register, go to SAM.gov Entity Registration and click Get Started. From the same page, you can also click on the Entity Registration Checklist for the

information you will need to register. Make sure you are current with SAM.gov and UEI requirements before applying for the award.

SAM.gov registration can take several weeks. Begin that process today.

Grants.gov

You must also have an active account with Grants.gov. You can see step-by-step instructions at the Grants.gov Quick Start Guide for Applicants.

Please visit How to Register to Apply for Grants for additional information.

C. Submission Instructions

You must submit your application through Grants.gov. See Section 5.B. above for information on getting registered.

Important tips:

- To begin the application process under this grant announcement, go to Grants.gov and click the red "Apply" button at the top of the view grant opportunity page associated with this opportunity.
- See the Quick Start Guide for Applicants for instructions on how to submit.
- Make sure your application passes the Grants.gov validation checks.
- Do not encrypt, zip, or password protect any files.
- Your application must be submitted by an official representative of your organization who is registered with Grants.gov and is authorized to sign applications for Federal financial assistance.
- If you receive an error or the button is grayed out, it may be because you do not have the appropriate role to submit in your organization. Contact your organization's EBiz point of contact or contact Grants.gov for assistance at 1-800-518-4726 or support@grants.gov.
- See Grants.gov Errors for information on other Grants.gov errors.
- The UEI listed on the application must be registered to the applicant organization's SAM.gov account. If not, the application may be deemed ineligible.

D. Technical Issues with Submission

If applicants experience technical issues during the submission of an application that they are unable to resolve, follow these procedures **before** the application deadline date:

- Contact Grants.gov Support Center before the application deadline date.
- Document the Grants.gov ticket/case number.
- Send an email with Funding Opportunity Number (FON): EPA-OA-OASES-26-10 in the subject line to electronic-grant-submissions@epa.gov before the application deadline time and date and must include the following:
- Grants.gov ticket/case number(s)
- Description of the issue
- The entire application package in PDF format.

Without this information, the EPA may not be able to consider applications submitted outside of Grants.gov. Any application submitted after the application deadline time and date deadline will be deemed ineligible and **not** be considered.

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

Applicants with limited or no access to the internet may request an exception by following the procedures outlined here. The request must be received at least 15 calendar days before the application due date to allow enough time to negotiate alternative submission methods.

E. Intergovernmental Review

Intergovernmental review is applicable to this assistance listing when proposed Federal financial assistance involves land use planning or construction associated with demonstration projects.

If the proposal includes land use planning or construction, you will need to submit application information for Intergovernmental Review. Some states have adopted Single Points of Contact (SPOC) for coordinating the review.

Contact the applicable grants office for further instruction.

This requirement does not apply to American Indian and Alaska Native Tribes or tribal organizations.

6. Application Review Information

A. Responsiveness Review

Applications must meet the eligibility requirements described in Section 2 to be evaluated. Applicants not meeting these requirements will be deemed ineligible and will be notified within 15 calendar days of the determination.

- Applications must adhere to the page limit requirements. Any pages over the limit(s) in Section 4 will not be reviewed.
- Initial applications must be submitted *on or before* the application deadline through Grants.gov or through limited circumstances as expressed in Section 5. The EPA will not evaluate applications that are not submitted on time.
- *Technical difficulties applying:* Applicants having technical difficulties applying must contact the Grants.gov hotline at 1-800-518-4726 *and* then must email a PDF of the full application to the EPA contact listed in Section 1. The submission must be received prior to the application deadline for consideration.

B. Review Criteria

Applicants will be evaluated based on the extent and quality to which they demonstrate that they have the capability to successfully perform the project as described in Section 3 of this funding opportunity.

Only eligible entities whose applications meet the threshold criteria in Section 2 of this announcement will be evaluated. **Applicants should explicitly address these criteria as part of their application package submittal in the project narrative.** Each application will be rated using a point system. Applications will be evaluated based on a total of 100 possible points.

Technical merit reviewers consider an application's merit based on the extent to which the application demonstrates the criteria below.

Technical Merit Review Criteria Reviewers will score each subcriteria on a scale from 0 to 10 (10 being the highest). The total weighted score (maximum 100) will be the sum of each subcriteria score multiplied by its weighting factor.	**Scoring Points Available**	**Weighting Factor**	**Maximum Points Possible**
1. Research Merits			
a. The degree to which the application demonstrates that the research is original and contributes to the scientific knowledge in the topic area, is defensible and technically feasible, and uses appropriate and adequate research methods.	10	3	**30**
b. The degree to which the application demonstrates that the project results will produce benefits to the public (such as improvement to the environment or human health from reduced air pollution exposure) and will be disseminated to enhance scientific and technological understanding.	10	2	**20**
2. Technical Responsiveness The degree to which the application demonstrates that the research is responsive to the objectives and research areas of interest specified in Section 3.A.	10	2	**20**
3. Project Management			
a. **Investigators**: The degree to which the application demonstrates that the Principal Investigator(s) and other key personnel have the appropriate qualifications to effectively perform the project (including research training, demonstrated knowledge of pertinent literature, experience and publication records).	10	0.8	**8**
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).	10	0.4	**4**
c. **Resources and Cost Controls**: The degree to which the application demonstrates that the facilities, equipment, and budget are appropriate, adequate, and available.	10	0.4	**4**
d. **Timely Expenditure of Grant Funds:** 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.	10	0.4	**4**
4. Past Performance History			
a. History of successfully managing and completing federally funded assistance agreements (grants and cooperative agreements, not contracts) performed within the last three years (no more than five agreements, preferably EPA agreements).	10	0.4	**4**

Technical Merit Review Criteria Reviewers will score each subcriteria on a scale from 0 to 10 (10 being the highest). The total weighted score (maximum 100) will be the sum of each subcriteria score multiplied by its weighting factor.	**Scoring Points Available**	**Weighting Factor**	**Maximum Points Possible**
b. History in meeting reporting requirements under the prior agreements and reporting progress toward achieving results (outputs/outcomes) under these agreements, including the proposed Lead/Contact PI's history of submitting acceptable and timely progress/final technical reports that adequately describe the progress toward achieving the expected results under the agreements and any explanation of why progress toward achieving the results was not made will also be considered.	10	0.2	**2**
c. History of whether journal publications or author manuscripts associated with the journal publications, and the associated underlying scientific research data and metadata, resulting from these prior assistance agreements were made publicly accessible, and if not whether the Lead/Contact PI adequately explained why not, or the Lead/Contact PI explained why the requirement does not apply.	10	0.4	**4**
Note: In evaluating applicants under items a, b, and c of criterion 4, the Agency will consider the information provided by the applicant and may also consider relevant information from other sources, including agency files and prior/current grantors (e.g., to verify and/or supplement the information supplied by the applicant). If you do not have any relevant or available past performance or reporting information, please indicate this in the application, and you will receive a neutral score (5 out 10) for these sub-factors. If you do not provide any response for these items, you may receive a score of 0 for these subfactors.			
Total (Weighted)			100

C. Review and Selection Process

1. Review Process

Applications will first be evaluated against the threshold factors listed in Section 2.A. of this NOFO. Only those applications which meet all the threshold factors will be evaluated using the evaluation criteria listed above.

All eligible applications will be reviewed by two external reviewers (from universities, private sector, and public sector including federal agencies other than EPA) and one internal EPA reviewer. The individual external 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. The individual internal reviewers include experts from the EPA, including individuals from the Office of the Administrator (AO) and program and regional offices knowledgeable in the subject matter proposed.

Reviewers will evaluate each application and assign a score on a 0–10 scale (with 10 being the highest) and provide a written evaluation of strengths and weaknesses for each Technical Merit Review criterion described above. Each application will receive three total weighted scores, one for each reviewer. The total weighted score (maximum 100) will be the sum of each of the subcriteria scores multiplied by its weighting factor.

Those applications receiving at least two total weighted scores of 75 or at least one total weighted score of 90 from among the reviewers will qualify to be further considered. All other applications will be declined for further consideration.

The qualifying applications will be ranked by average score and the resulting list will be provided to the EPA Selection Official for consideration.

2. Selection Decisions

Selection decisions will be made by the selection official, the Associate Administrator and Agency Science Advisor of the Office of Applied Science and Environmental Solutions, based on the technical merit score. In making the selection decisions, the selection official may also consider the following factors:

- Selection of priority activities over other assistance activities (Programmatic/Agency Priorities);
- Number and size of awards;
- Available funds;
- Similarity of the project to other EPA-funded projects;
- Potential scientific and/or commitment duplication/overlap; and
- Results of disclosure of current and pending support (Section 4.B.k)

D. Risk Review

The EPA will conduct a risk review of selected applications before making awards, as required by 2 CFR § 200.206. As part of this review, EPA may consider the following:

- information available in the responsibility/qualification records in SAM.gov, including any comments made by the applicant.
- if the applicant is a new recipient, whether they have completed the mandatory training requirement outlined in RAIN-2024-G01 New Recipient Training Requirement
- any unresolved administrative findings in EPA records
- reported issues related to financial stability and/or management systems
- past performance or audit issues

7. Award Notices

The EPA anticipates notifications to successful, and unsuccessful applicants will be made by the Office of the Administrator in writing in accordance with the schedule described in Section 1.C**.** The notification will be sent to the original signer of the application or the project contact listed in the application and indicate selection status. **Notification of selection is not an authorization to begin work.** The official notification of an award will be made by the EPA Grants Management Division. Selection does not guarantee an award will be made. Statutory authorization, funding, or other issues during the award process may affect the ability of the EPA to make an award. The award notice, signed by an EPA grants officer, is the authorizing document and will be provided through electronic or postal mail. The successful applicant may need to prepare and submit additional documents and forms, which must be

approved by the EPA, before the grant can officially be awarded. The time between notification of selection and award of a grant can take up to 90 days or longer.

8. Post-Award Requirements and Administration

A. Administrative and National Policy Requirements

The recipient and any sub-recipient must comply with the applicable General Terms and Conditions. These terms and conditions are in addition to the assurances and certifications made as part of the *award*, terms and conditions, and restrictions reflected on the official assistance award document.

Awards issued as a result of this funding opportunity are subject to the requirements of the Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards; Title 2 CFR Part 200, 2 CFR Part 1500, and 40 CFR Part 40.

B. Reporting

EPA's General Terms and Conditions in the Notice of Award will have information on performance and financial reports, including:

- How often you will report.
- Any required form or formatting.
- How to submit them.

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.

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 Project Officer of any papers published after completion of the grant that were based on research supported by the grant. EPA posts references to all publications resulting from a grant on EPA's Research Grants website.

C. Subaward and Executive Compensation Reporting

The Federal Financial Accountability and Transparency Act (FFATA) requires:

- Data entry at SAM.gov for all subawards and subcontracts issued for $30,000 or more.
- Reporting executive compensation for both recipient and subaward organizations.

D. Human Subjects and Quality Assurance Review

EPA may work with the applicant to make sure the following assurances are met:

a. Human Subjects Research Statement (HSRS) Review

Selected applications that involve human subjects research studies will have their HSRS reviewed prior to award. An 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.

Applicants must agree to meet all EPA requirements for studies using human subjects prior to implementing any work with these subjects. These requirements are found at 40 CFR Part 26. Studies involving intentional exposure of human subjects who are children or pregnant or nursing women are prohibited. For observational studies involving children or pregnant women and fetuses please refer to Subparts C & D of 40 CFR Part 26. U.S. Department of Health and Human Services regulations at 45 CFR Part 46.101(e) have long required "... compliance with pertinent Federal laws or regulations which provide additional protection for human subjects." EPA's regulation 40 CFR Part 26 is such a pertinent Federal regulation. Therefore, the applicant's Institutional Review Board (IRB) approval must state that the applicant's study meets the EPA's regulations at 40 CFR Part 26. No work involving human subjects, including recruiting, may be initiated before the EPA has received a copy of the applicant's IRB approval of the project and the EPA has also provided approval. Where human subjects are involved in the research, the recipient must provide evidence of subsequent IRB reviews, including amendments or minor changes of protocol, as part of progress reports.

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

Basic Information about Human Subjects Research

Protection of Human Subjects

b. Quality Assurance Statement (QAS) Review

EPA will evaluate the merits of the QAS for those applications recommended for award. The QAS will be evaluated to ensure they are appropriate and adequate. If upon review of the QAS, EPA identifies any issues with the QAS, EPA will raise these issues to the applicant, so they may be addressed.

In accordance with 2 CFR Part 1500.12 and the Agency Quality Directives, all assistance agreements that include environmental information operations must submit a Quality Management Plan (QMP) for EPA approval. A QMP describes and documents the organization's Quality Program, including the program's organizational structure, quality policies and procedures, criteria and areas of application, and roles, responsibilities and authorities. It describes an organization's overall quality program and provides a framework for implementing quality assurance across all projects and operations within the organization.

The QMP documents all technical activities to be performed under the Quality Program and describes how the program will integrate quality assurance and quality control policies and procedures, and Quality Assurance Project Plans (QAPPs) into all environmental information operations. The QMP must comply with the requirements of the EPA Quality Directives.

EPA Project Officers will work with all selected recipients on quality assurance requirements, which will be documented in the grant Quality Assurance Terms and Conditions. Once the award is made, if a QMP is required for the grant, the applicant will develop a QMP in accordance with the current version of the EPA QMP Standard CIO 2105 S-01, and submit for EPA approval in accordance with the awarding EPA Office's QMP. Selected applicants cannot begin environmental information operations until EPA approves the applicant's QMP.

Projects falling under the assistance agreement that include environmental information operations are required to submit a QAPP consistent with the requirements of the current version of the EPA QAPP Standard CIO 2105-S-02. A QAPP is specific to individual projects and outlines the procedures and processes necessary to ensure the quality of data or information generated during the project. It details the project's objectives, the type and quality of environmental information required, and how it will be collected, analyzed, and used.

9. Other Information

A. Additional Provisions for Applicants

Additional provisions that apply this funding opportunity and/or awards made under this funding opportunity, can be found at EPA NOFO Clauses. If you are unable to access these provisions electronically at the website above, please contact the EPA point of contact to obtain the provisions.

Expectations and responsibilities of grant recipients are summarized in this section.

In accordance with EPA's commitment to the implementation of Gold Standard Science, any project funded under this NOFO must align with the tenets/criteria described in Executive Order (EO) 14303, Restoring Gold Standard Science. The principles of EO 14303 ensure that federally funded research is transparent, rigorous, and impactful, allowing for subsequent federal decisions to be informed by the most credible, reliable, and impartial scientific evidence available. Gold standard science is defined as science conducted in a manner that is reproducible; transparent; communicative of error and uncertainty; collaborative and interdisciplinary; skeptical of its findings and assumptions; structured for falsifiability of hypotheses; subject to unbiased peer review; accepting of negative results as positive outcomes; and without conflicts of interests. More information on the conduct of science consistent with these nine tenets is outlined in Agency Guidance for Implementing Gold Standard Science in the Conduct & Management of Scientific Activities.

1. Data Access and Information Release
EPA's requirements associated with data access and information release as well as copyrights, may be accessed at EPA Notice of Funding Opportunity (NOFO) Clauses.

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 Information Quality Guidelines. These procedures may apply to data generated by grant recipients if those data are disseminated as described in the Guidelines.

2. 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. The specific acknowledgement language to be included in any documents developed under this agreement that are intended for distribution to the public or inclusion in a scientific, technical, or other journal will be provided in the award's terms and conditions. Publications and other reports that acknowledge EPA support should also include a disclaimer stating that the views expressed are those of the authors and do not necessarily reflect the views of EPA.