COVID-19 Update: EPA is providing flexibilities to applicants experiencing challenges related to COVID-19. Please see the **Flexibilities Available to Organizations Impacted by COVID-19** clause in Section IV of EPA's Solicitation Clauses.

OVERVIEW INFORMATION

U.S. Environmental Protection Agency
Office of Science Advisor, Policy and Engagement
Office of Research and Development
People, Prosperity, and the Planet (P3) Program

18TH ANNUAL P3 AWARDS: A NATIONAL STUDENT DESIGN COMPETITION FOCUSING ON PEOPLE, PROSPERITY AND THE PLANET

This is the initial announcement of this funding opportunity.

Funding Opportunity Numbers (FONs) and Associated Research Areas:
EPA-G2021-P3-Q1 – Air Quality
EPA-G2021-P3-Q2 – Safe and Sustainable Water Resources
EPA-G2021-P3-Q3 – Sustainable and Healthy Communities
EPA-G2021-P3-Q4 – Chemical Safety

Assistance Listing Number: 66.516

Solicitation Opening Date: ***November 13, 2020***
Solicitation Closing Date: ***February 9, 2021*****: 11:59:59 pm Eastern Time**

Table of Contents

SUMMARY OF PROGRAM REQUIREMENTS
- Synopsis of Program
- Award Information
- Eligibility Information
- Application Materials
- Agency Contacts

I. FUNDING OPPORTUNITY DESCRIPTION
- A. Introduction
- B. Background
- C. Authority and Regulations
- D. Specific Areas of Interest/Expected Outputs and Outcomes
- E. References
- F. Special Requirements

II. AWARD INFORMATION

III. ELIGIBILITY INFORMATION
- A. Eligible Applicants
- B. Cost Sharing
- C. Other

IV. APPLICATION AND SUBMISSION INFORMATION
- A. Grants.gov Submittal Requirements and Limited Exception Procedures

B. Application Package Information
C. Content and Form of Application Submission
D. Submission Dates and Times
E. Funding Restrictions
F. Submission Instructions for Phase I Applications and Other Submission Requirements
G. Submission Instructions for Phase II Applications
V. APPLICATION REVIEW INFORMATION
A. Review Process for Phase I Applications
B. Review Process for Phase II Applications
C. Human Subjects Research Statement (HSRS) Review
D. Evaluation of the Scientific Data Management Plan
E. Funding Decisions
F. Additional Provisions for Applicants Incorporated into the Solicitation
VI. AWARD ADMINISTRATION INFORMATION
A. Award Notices
B. Disputes
C. Administrative and National Policy Requirements
VII. AGENCY CONTACTS

Access Standard Forms (https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms)
View research awarded under previous solicitations (https://www.epa.gov/P3)

SUMMARY OF PROGRAM REQUIREMENTS

Synopsis of Program:
The U.S. Environmental Protection Agency (EPA), as part of its People, Prosperity and the Planet (P3) Award Program – is seeking applications proposing to research, develop, design, and demonstrate solutions to real world challenges. The P3 competition highlights the use of scientific principles in creating innovative technology-based projects that achieve the mutual goals of improved quality of life, economic prosperity and protection of the planet – people, prosperity, and the planet. The EPA offers the P3 competition to respond to the environmental and human health protection needs of people in the United States, including those in small, rural, tribal and/or disadvantaged communities. Please see the P3 Student Design Competition website for more details about this program. Proposed projects must embody the P3 approach, which is that they have the intention and capability to simultaneously improve the quality of people's lives, provide economic benefits and protect the environment.

EPA recognizes the impact that the COVID-19 pandemic and resulting adaptions to in-person learning and laboratory access experienced by colleges and universities. P3 encourages applicants to consider projects that are conducive to conducting research during a pandemic (social distancing, on-line learning, etc.). EPA is monitoring the COVID-19 pandemic and if it is still impacting in-person meetings, a virtual Expo will be planned. PIs will be notified in advance if the National Student Design Expo moves from in-person to virtual.

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for

pregnant women and fetuses, nursing women, and children at subparts B, C, and D. Research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women, and children. Research meeting the regulatory definition of observational research found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). All applications must include a Human Subjects Research Statement (HSRS, as described in Section IV.C.6.c of this solicitation), and if the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.C and V.E of this solicitation.

Guidance and training for investigators conducting EPA-funded research involving human subjects may be obtained here:
https://www.epa.gov/osa/basic-information-about-human-subjects-research-0
https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr26_main_02.tpl

The P3 Program is intended to address domestic U.S. needs. For this reason, P3 projects should primarily perform their research in the U.S. and the benefits of the research should primarily accrue to the U.S. Applications that do not meet these requirements may not be evaluated as highly during the relevancy review, and therefore may not be recommended for an award.

Award Information:
Anticipated Type of Award: Grant
Estimated Number of Awards: Approximately 20 awards for Phase I; Approximately five awards for Phase II.
Anticipated Funding Amount: Approximately $1 million total for all awards
Potential Funding per Award: Up to $25,000 per Phase I grant including direct and indirect costs. Applications for Phase I grants requesting an award of more than $25,000 will not be considered. Applications for Phase I grants must be for one year. Applications with budgets exceeding the total award limits and duration will not be considered. Upon the successful completion of Phase I, grant recipients will have the opportunity to apply for a P3 Phase II grant of up to $100,000 total with a two-year duration, including direct and indirect costs (see Background section for more information). Applications for Phase II grants requesting an award of more than $100,000 or with a duration of more than two years will not be considered.
Cost-sharing is not required for either Phase I or Phase II grants.

Eligibility Information:
Public and private institutions of higher education (limited to degree-granting institutions of higher education) located in the U.S. (includes eligible institutions of higher education located in U.S. territories and possessions) are eligible to apply to be the recipient of a grant to support teams of undergraduate and/or graduate students. Profit-making firms are not eligible to receive assistance agreements from the EPA under this program. See full announcement for more details.

Application Materials:
To apply under this solicitation, use the application package available at Grants.gov (for further submission information see Section IV.F. “Submission Instructions for Phase I Applications and Other Submission Requirements”). Note: With the exception of the current and pending support form (available at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms), all necessary forms

are included in the electronic application package. Make sure to include the current and pending support form in your Grants.gov submission.

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

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

Agency Contacts:
Technical Contact: Angela Page; phone: 202-564-7957; email: page.angela@epa.gov
Eligibility Contact: Ron Josephson; phone: 202-564-7823; email: josephson.ron@epa.gov
Electronic Submissions Contact: Debra M. Jones; phone: 202-564-7839; email: jones.debram@epa.gov

I. FUNDING OPPORTUNITY DESCRIPTION

A. Introduction

The U.S. Environmental Protection Agency (EPA), under the auspices of the Office of Research and Development (ORD), Office of Science Advisor, Policy and Engagement (OSAPE), invites submissions to the 18th Annual P3 Awards: A National Student Design Competition Focusing on People, Prosperity and the Planet. The P3 Program supports science-based projects and designs developed by interdisciplinary student teams at colleges and universities. Projects must embody the P3 approach, combining intention and capability to improve the quality of people's lives, provide economic benefits, and protect the environment.

The P3 approach is based on the concept of sustainability. The goal of sustainability, derived from the U.S. National Environmental Policy Act of 1969 (NEPA), is to "create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations." Use of the term "sustainability" was widely adopted following the publication of *Our Common Future* (World Commission on Environment and Development, 1987), which defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Successful sustainable design recognizes the needs, available resources, and boundaries of the intended user. See for instance: *Cradle to Cradle* (Braungart & McDonough, 2002), *The Upcycle: Beyond Sustainability--Designing for Abundance* (McDonough & Braungart, 2013), *Engineered Biomimicry* (Lakhtakia & Martín-Palma, 2013) and *Biomimicry* (Benyus, 2002). An overview of the definition of sustainability for application in P3 research applications is provided in the EPA Sustainability Primer.

The P3 Program is composed of two phases that award grants on a competitive basis. The purpose of this Request for Applications (RFA) is to solicit applications for innovative

research projects and designs to compete for Phase I of the P3 Program. The first phase is a competition for one-year grants of up to $25,000 to test, research, and develop innovative scientific projects or engineering designs that use the P3 approach. In the summer of 2022, the Phase I grantees awarded from this solicitation are required to present their projects/designs at the National Student Design Expo. EPA will provide teams with information about the Expo during the award year. EPA is monitoring the COVID-19 pandemic and if it is still impacting in-person meetings, a virtual Expo will be planned. PIs will be notified in advance if the National Student Design Expo moves from in-person to virtual.

In the summer of 2022, Phase I grant recipients will submit a *Project Report* that will serve as an application for a Phase II grant award of up to $100,000. The Phase II grant awards are intended to support the further development and demonstration of the projects/designs created in Phase I. The competitors for 2022 P3 Phase II grants are limited to recipients of Phase I grant awards from this solicitation. Additional instructions for completing the Phase II applications will be distributed to Phase I recipients. Those projects identified for receipt of a Phase II grant will be recognized as P3 Award recipients on the P3 website. If a team elects not to compete for a Phase II grant award, its faculty advisor (the Principal Investigator [PI] for the grant) must inform the EPA Project Officer and a Final Report must be submitted per the award's Terms and Conditions.

This RFA represents the 18th National P3 Awards competition. Previously awarded projects funded through this program can be viewed at the People, Prosperity and the Planet (P3) Student Design Competition website.

P3 supports STEM education through hands-on experience and training that brings students' classroom learning to life, while also allowing student teams to create tangible changes in their communities. To the extent practicable, applicants should describe the STEM education ecosystem in their project. A STEM education ecosystem consists of partners united by a collective vision of supporting participation in STEM through the creation of accessible, inclusive STEM learning opportunities spanning all education stages and career pathways. A STEM education ecosystem continuously evaluates its activities and adapts as needed, plans for the long-term, and communicates its work to build broad support and advance best-practices.

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

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

1. Historically Black Colleges and Universities, as defined by the Higher Education Act (20 U.S.C. § 1061(2)). A list of these schools can be found at Historically Black Colleges and Universities;

2. Tribal Colleges and Universities (TCUs), as defined by the Higher Education Act (20 U.S.C. § 1059c(b)(3) and (d)(1)). A list of these schools can be found at American Indian Tribally Controlled Colleges and Universities;

3. Hispanic-Serving Institutions (HSIs), as defined by the Higher Education Act (20 U.S.C.

§ 1101a(a)(5)). A list of these schools can be found at Hispanic-Serving Institutions;

4. Asian American and Native American Pacific Islander-Serving Institutions; (AANAPISIs), as defined by the Higher Education Act (20 U.S.C. § 1059g(b)(2)). A list of these schools can be found at Asian American and Native American Pacific Islander-Serving Institutions; and

5. Predominately Black Institutions (PBIs), as defined by the Higher Education Act of 2008, 20 U.S.C. 1059e(b)(6). A list of these schools can be found at Predominately Black Institutions.

B. Background

The P3 Program encourages a shift towards more environmentally benign products, processes, and systems. It is essential that all involved in the design, discovery, and demonstration of technical innovations understand the fundamental techniques and principles that underlie the P3 approach. Innovative research can take the form of wholly new applications or applications that build on existing knowledge and approaches for new uses. The proposed research aligns with current EPA priorities included in the FY 2018-2022 Strategic Plan, Goal 3: Greater Certainty, Compliance, and Effectiveness, Objective 3.3: Prioritize Robust Science.

EPA's P3 Program has identified the following four strategic program goals.

Goal 1: Engage and educate the next generation of scientists, engineers, and the greater academic and external communities in understanding and using the P3 approach.

Goal 2: Support the development of innovative technologies that will contribute to improved social, environmental, and economic well-being, especially in communities with the greatest needs.

Goal 3: Support the demonstration of P3-developed technologies to prove their effectiveness and value.

Goal 4: Foster the development of enterprises that will disseminate technologies in the target communities and elsewhere.

EPA strongly encourages projects to include partnerships with industry, non-governmental organizations (NGOs), and other educational and research institutions to increase their capacity to meet the goals of the project. A partnership is defined as an arrangement where parties agree to cooperate to advance their mutual interests. No matter the arrangement, project partners should, for example, help further develop the design, demonstrate the project in the field, and/or move the design to the marketplace. Matching contributions are not required nor expected from partners or others in either the Phase I or the Phase II competition. If the applicant does not intend to partner with other groups in the performance of the project, the applicant must demonstrate how it will be able to effectively perform and complete the project without such partnership.

Although P3 grant funding must be used for research and cannot be used for commercialization and for-profit initiatives (such as business creation), applications with commercial potential are encouraged to apply to EPA's Small Business Innovation Research (SBIR) Program. Since its inception, EPA's SBIR Program has provided incentive funding to small businesses to translate their innovative ideas into commercial products that address environmental problems. The EPA is one of 11 federal agencies that participate in the SBIR Program established by the Small Business Innovation

Development Act of 1982. EPA issues annual solicitations for Phase I and Phase II research applications from science and technology-based firms (not universities). EPA's SBIR program has funded companies that were formed by individuals who participated in P3 projects and acted upon the commercial potential of the innovative technology that they created in their projects.

Many institutions have entrepreneurship centers where adjunct faculty are practicing entrepreneurs. SBIR applicants are encouraged to consult with their university's business or management school or department and entrepreneurship center faculty for advice about how best to design their proposed research and to include those faculty and their students in their project teams. For more information on EPA's SBIR Program see Small Business Innovation Research (SBIR) Program. For more information about the federal SBIR Program see SBIR.

This announcement addresses the first phase (Phase I) of the P3 competition by requesting applications for innovative research projects or designs from eligible institutions. The Phase I grants are intended to support an interdisciplinary team of undergraduate and/or graduate students to develop their projects/designs in preparation for competing for a P3 Phase II grant award to demonstrate their proposed projects/designs. The EPA will fund approximately 20 Phase I research applications from around the country during the 2021-2022 academic years.

The proposal process for the Phase II grant awards will begin in the summer of 2022, when the student teams and their faculty advisor (the Principal Investigator [PI] on the grant) submit a *Project Report* describing the Phase I project activities and the Phase II application for further development and demonstration. The EPA will fund approximately five Phase II research applications. A panel of qualified experts will be convened to review the applications and score them based on the evaluation criteria described in Section V.

Institutions are also encouraged to include in their project team's faculty and students from their educational and social science schools and departments and from other relevant disciplines who can help meet the educational and outreach requirements for the projects.

C. Authority and Regulations

The authorities for this RFA and resulting awards are contained in the Safe Drinking Water Act, 42 U.S.C. 300j-1, Section 1442; the Clean Water Act, 33 U.S.C. 1254, Section 104(b)(3); the Toxic Substances Control Act, 15 U.S.C. 2609, Section 10; the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136r, Section 20; the Clean Air Act, 42 U.S.C. 7403, Section 103(b)(3); and the Solid Waste Disposal Act, 42 U.S.C. 6981, Section 8001.

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

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

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

D. Specific Areas of Interest/Expected Outputs and Outcomes

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

EPA identifies, assesses, conducts, and applies the best available science to address current and future environmental hazards, develop new approaches, and improve the scientific foundation for environmental protection decisions. EPA conducts problem-driven, interdisciplinary research to address specific public health and environmental risks. The P3 Program is committed to using science and innovation to support EPA programs, regions, states, and tribes in accomplishing their top priorities for improved air quality, safe and sustainable water resources, sustainable and healthy communities, and chemical safety. This is accomplished in part by supporting the development and demonstration of emerging technologies.

The activities to be funded under this announcement support EPA's FY 2018-22 Strategic Plan (https://www.epa.gov/planandbudget/strategicplan). Activities to be funded under this announcement support Goal 3: Greater Certainty, Compliance, and Effectiveness, Objective 3.3: Prioritize Robust Science, of EPA's FY 2018-22 Strategic Plan. Awards made under this announcement will further EPA's priorities supporting robust science for: Air Quality; Safe and Sustainable Water Resources; Sustainable and Healthy Communities; or Chemical Safety. All applications must be for projects that support the goal and objective identified above.

The P3 Program supports these priorities by funding multi-disciplinary, faculty-led student teams that use the best available scientific knowledge and research results to address environmental problems identified by EPA's program offices, states and tribal partners as being important to the public, including small, rural, tribal and disadvantaged communities. As a result, the P3 Program provides tested innovative solutions that stakeholders can use to help solve these problems.

EPA also 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, https://www.epa.gov/grants/epa-order-57007a1-epas-policy-environmental-results-under-epa-assistance-agreements). Applicants must include specific statements 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 priorities described above.

Specific Areas of Interest

Applicants must address one of the research areas listed below in their Phase I applications. *Note that each application must be submitted using a single Funding Opportunity Number (FON).* Within the selected research area, applicants should select one of the listed topics to be the focus of their project. If applicants propose a project that does not address one of the topics listed under the research areas below, they may not be evaluated as highly during the relevancy review, and therefore may not be recommended for an award. Review

criteria specific to the P3 Program and against which the Phase I applications will be evaluated are presented in Section V.A.2. To fulfill Agency requirements for a research grant, **all applications should clearly articulate how the proposed project/design will result in pollution prevention and/or control.** The link to pollution prevention should be direct such as reduction in air emissions from a more efficient engine design. Applications should also consider the lifecycle environmental impacts of the project, including (if applicable) materials management, minimizing pollution, minimizing toxicity of materials, efficient use of water and energy and minimizing the impacts of disposal.

Air Quality (Funding Opportunity Number: EPA-G2021-P3-Q1)

EPA supports research that advances the science and provides the information critical to improving air quality.

Innovation in air monitoring technologies can significantly reduce monitoring costs, provide more detailed and timely information on ambient air quality and provide opportunities for businesses to address leaks and emissions before they become significant problems. EPA seeks projects that would support research and demonstration of innovative and cost-effective solutions for the following topics (not listed in any priority order):

1. Approaches to prevent and reduce air pollution, particularly in a multipollutant context
2. Emission reduction strategies for stationary sources
3. Emission control technologies to reduce mobile-source-related pollution
4. Measurement and monitoring methods to enable informed air quality decision-making at the state and local level
5. Technologies to measure low ambient concentrations of air pollutants
6. Technologies and approaches to reduce the level of personal exposure to air pollutants or indoor concentrations of pollutants
7. Technologies that reduce the level of air toxics in communities, which may include small, rural, tribal and/or disadvantaged communities
8. Technologies to provide more low-cost, easily implemented mitigation of radon contamination, especially in older homes or in low income communities

Safe and Sustainable Water Resources (Funding Opportunity Number: EPA-G2021-P3-Q2)

EPA supports research for developing innovative, cost-effective solutions to current, emerging, and long-term water resource challenges for complex chemical and biological contaminants. EPA seeks projects that would support the development and demonstration of innovative and cost-effective solutions for the following topics (not listed in any priority order):

1. Technologies for the rehabilitation of water infrastructure
2. Sampling devices to detect, collect and quantify microplastics in surface water, drinking water, sludge/biosolids and/or discharges from wastewater treatment systems
3. Novel technologies for point-of-use removal of Per- and poly fluoroalkyl substances (PFAS) from Drinking Water
4. Methods for detecting and monitoring waterborne pathogens such as legionella and/or mycobacteria

5. Innovative technologies and processes for stormwater management in small, rural, tribal, and/or disadvantaged communities
6. Non-brine producing technologies and processes for water reuse implementation in small communities
7. Technologies to detect and reduce exposure to lead in drinking water systems, such as developing simple, inexpensive tests for use in homes to check for lead in tap water
8. Innovative and potentially low-cost technologies for the rapid detection of antibiotic-resistant bacteria in wastewater
9. Technologies or methods to rapidly detect and distinguish between sources of pollutants in stormwater runoff or surface waters
10. Methods for analyzing and summarizing continuous water quality monitoring data utilizing user-friendly open-source software packages, statistical methods or technologies

Sustainable and Healthy Communities (Funding Opportunity Number: EPA-G2021-P3-Q3)

EPA supports research for developing and demonstrating technologies to prevent contamination by toxic materials and to reduce solid waste that goes to landfills. EPA seeks projects that support research and demonstration of innovative and cost-effective solutions for the following topics (not listed in any priority order):

1. Development of replacements for polyvinyl chloride (PVC) and polyethylene (PE) water pipes which currently have a high probability of being discarded to landfills
2. Remediation of PFAS-contaminated soil and sediment
3. Development of construction materials that are less toxic, lighter, more compact, stronger, more durable, longer-lasting, more affordable, reusable and recyclable than currently used materials
4. Development of less toxic building materials for indoor spaces such as in floors, walls, and ceilings
5. Solutions to reduce the amount of food waste including food waste prevention, recycling and disposal technologies
6. Electronic components that are less toxic and/or easier to reuse and recycle
7. Management of disaster debris and waste
    a. decision support tools that incorporate information and best practices that encourage post-disaster recycling
    b. reuse of waste materials to support sustainable materials management practices
8. Research on how extreme events like pandemics may influence contaminant exposures and exacerbate associated health disparities in small, rural, tribal and/or disadvantaged communities.
9. Development of natural shoreline materials or designs to protect coastal communities from pollutant/contaminant migration under extreme events.

Chemical Safety (Funding Opportunity Number: EPA-G2021-P3-Q4)

EPA supports research for evaluating and predicting impacts from chemical use and disposal and providing states and industries with information, tools, and methods to make better informed and more timely decisions about the thousands of chemicals in the United States.

EPA seeks projects that would support research and demonstration of innovative and cost-effective solutions for the following topics (not listed in any priority order):

1. Non-toxic chemicals that can replace toxic chemicals used in the manufacture of plastics (green chemistry)
2. Plastic children's products made from non-toxic materials
3. Non-toxic paints and coatings/cleaner manufacturing of coloration technologies: Cleaner manufacturing means development and use of pigment, dye, paint, and ink manufacturing processes, as well as the development of new coloration technologies such as biomimicry and structural color, that do not coincidentally produce polychlorinated biphenyls (PCBs).
4. Inherently flame-retardant materials—i.e., that do not use a flame-retardant coating or any PFAS
5. New chemicals that cause less depletion of stratospheric ozone than currently-used substances
6. New Approach Methodologies (NAMs) to help reduce or replace animal testing, as well as tools to assess their feasibility. EPA defines NAMs as technologies, approaches and combinations of them, including *in vitro* and *in silico* testing methods, and methodologies that can integrate and calculate data from various sources, and serve to reduce, refine or replace vertebrate animal testing.

It is recognized that some applications may be appropriate for more than one FON/research area, but the applicant must identify a primary FON/research area for application submission purposes. The primary FON/research area is used to determine the appropriate peer review panel. Applicants should also select one of the topics in that research area as the focus for their P3 project.

Expected Outputs and Outcomes

Research outputs expected from the research funded under this RFA may include innovative, inherently benign, integrated, and interdisciplinary designs that will advance the scientific, technical, and policy knowledge necessary to enhance the human condition in communities, for example, those in small, rural, tribal and/or disadvantaged communities.

The desired outcomes of the research conducted via this program address the three components of the P3 approach. Through the use of P3-supported technologies, this research aims to simultaneously: (1) maintain or improve human health and well-being; (2) advance economic competitiveness; and (3) protect and preserve the environment by effectively and efficiently using water, materials, and energy and minimizing the generation or emission of pollution or minimizing the use of toxic substances.

The outputs and outcomes of the research efforts conducted via the individual P3 grants contribute directly to accomplishing the P3 Program goals presented in Section I.B of this solicitation.

Please note the following Agency requirements for P3 research applications:

• All applications should clearly articulate how the proposed project/design will result in pollution prevention and/or control or describe how the proposed project/design proposes research within the scope of the statutes described in Section I.C. above. (NEPA is a secondary supporting statute for projects with an international component and cannot be the sole supporting statute for a proposed project).

• The P3 Program is intended to address domestic U.S. needs. For this reason, P3 projects should primarily perform their research in the U.S. and the benefits of the research should primarily accrue to the U.S. Applications that do not meet these requirements may not be evaluated as highly during the relevancy review, and therefore may not be recommended for an award.
• Generally, an application to this solicitation should address the causes, effects, extent, prevention, reduction, and elimination of air pollution, water pollution, solid/hazardous waste pollution, toxic substances control, or pesticide control. Applications should not focus on fixing an environmental problem via a well-established method, but instead highlight their innovative research aspects. The first instance of the application of a pollution-control technique or an innovative application of a previously used method would be considered appropriate for the P3 Program.
• To the extent practicable, research applications must embody innovation and sustainability. Innovation for the purposes of this RFA is defined as the process of making changes; a new method, custom or device. Innovative research can take the form of wholly new applications or applications that build on existing knowledge and approaches for new uses. Research applications must include a discussion on how the proposed research is innovative (see Section IV.C.6.a). The goal of sustainability, derived from the U.S. National Environmental Policy Act of 1969 (NEPA), is to "create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations." Research applications must include a discussion on how the proposed research will seek sustainable solutions that protect the environment and strengthen our communities (see Section IV.C.6.a). Reviewers will draw from all of the above-mentioned innovation and sustainability definitions in the review/evaluation process of research applications (see Section V.A).

Review criteria specific to the P3 Program are presented in Sections V.A. and V.B.

E. References

Reports

1. United Nations. *Rio +20 United Nationals Conference on Sustainable Development Outcome Document.* United Nations (The Future We Want), 2012.

2. United States Environmental Protection Agency. *Sustainability Research Strategy,* EPA 600/S 07/001. (Sustainability Research Strategy [PDF]) (72 pp, 1.14 MB), 2007.

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3. Benyus, J. *Biomimicry: Innovation Inspired by Nature.* William Morrow Paperbacks, 2002. ISBN 978-0060533229.

4. Braungart, M. & McDonough, W. *Cradle to Cradle.* North Point Press, 2002. ISBN 978- 0865475878.

5. Lakhtakia, A. & Martín-Palma, R.J. (Eds.) *Engineered Biomimicry.* Elsevier, 2013. ISBN: 978-0-12-415995-2. https://www.sciencedirect.com/science/book/9780124159952 (E-book)

6. McDonough, W. & Braungart, M. *The Upcycle: Beyond Sustainability—Designing for Abundance.* North Point Press, 2013. ISBN 978-086547748

7. World Commission on Environment and Development. *Our Common Future.* Oxford: Oxford University Press, 1987.

F. Special Requirements

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: https://www.epa.gov/research/non-epa-researcher-requirements. Terms and conditions implementing this policy may be accessed at: https://www.epa.gov/research/non-epa-researcher-requirements.

Applications submitted under this announcement shall include a Scientific Data Management Plan (SDMP) that addresses public access to EPA-funded scientific research data. See the SDMP clause in Section IV for details on the content of an SDMP. Applicants will also be asked to provide past performance information on whether journal publications or associated author manuscripts, and the associated underlying scientific research data and metadata, under prior assistance agreements were made publicly accessible. 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 IV.

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

P3 Award projects (both Phase I & II) will not accommodate a multiple PI application. P3 Award projects should be submitted as a single lead PI application.

This solicitation provides the opportunity for the submission of applications for projects that may involve human subjects research. All applications must include a Human Subjects Research Statement (HSRS; described in Section IV.C.6.c of this solicitation). If the project involves human subjects research, it will be subject to an additional level of review prior to funding decisions being made as described in Sections V.C and V.E of this solicitation.

A P3 project may involve intellectual property (IP). If that is the case, P3 teams are encouraged to ensure that their institution's technology transfer office reviews any IP-

related materials before making them public. This is to ensure that any concerns related to patent filings or adjustments to IP strategies, if needed, can be addressed prior to any public display.

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

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

II. AWARD INFORMATION

It is anticipated that a total of approximately $1 million will be awarded under this announcement, depending on the availability of funds, quality of applications received and other applicable considerations. The EPA anticipates funding approximately 20 awards for Phase I under this RFA. The EPA award amount for each Phase I grant is up to $25,000 for its one-year duration. Requests for amounts in excess of a total of $25,000, including direct and indirect costs, will not be considered. The total project period for an application submitted for a Phase I grant from this RFA may not exceed one year.

Phase II applications should further develop and demonstrate the project/design created in Phase I. EPA will select approximately five P3 Award winners from among recipients of Phase I funding, depending on the availability of funds, quality of applications received and other applicable considerations. These P3 Phase II awardees will be eligible to receive up to $100,000 each. Applications for Phase II grants with total budget requests exceeding $100,000, including direct and indirect costs, will not be considered. The total project period for a Phase II grant may not exceed two years. Additional submission instructions for the Phase II competition will be provided to the Phase I awardees in the award terms and conditions.

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

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

EPA intends to award only grants under this announcement. Under a *grant,* EPA scientists and engineers are not permitted to be substantially involved in the execution of the research. However, EPA encourages interaction between its own laboratory scientists and grant Principal Investigators after the award of an EPA grant for the sole purpose of exchanging information in research areas of common interest that may add value to their

respective research activities. This interaction must be incidental rather than substantial to achieving the goals of the research under a grant. Interaction that is “incidental” does not involve resource commitments by EPA.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

Public and private institutions of higher education (limited to degree-granting institutions of higher education) located in the U.S. (includes eligible institutions of higher education located in U.S. territories and possessions) are eligible to apply to be the recipient of a grant to support teams of undergraduate and/or graduate students. Profit-making firms are not eligible to receive assistance agreements from the EPA under this program.

The students on the teams supported by the institution receiving the grant must be enrolled in the college, university, or post-secondary educational institution they will be representing at the time the application is submitted. Institutions are allowed to submit more than one application where each application represents a unique design concept and student team. For the purposes of grant administration, the team's faculty advisor will be designated the Principal Investigator throughout the P3 grant award and competition process.

Non-profit organization, as defined by 2 CFR 200.70, means any corporation, trust, association, cooperative or other organization that: (1) is operated primarily for scientific, educational, service, charitable or similar purposes in the public interest; (2) is not organized primarily for profit; and (3) uses its net proceeds to maintain, improve and/or expand its operations. Note that 2 CFR 200.70 specifically excludes Institutions of Higher Education from the definition of non-profit organization because they are separately defined in the regulation. While not considered to be a non-profit organization(s) as defined by 2 CFR 200.70, public or nonprofit Institutions of Higher Education are, nevertheless, eligible to submit applications under this RFA. State, local and federally-recognized Indian tribal governments are not eligible to submit applications under this program. Under this competition, eligible nonprofit organizations are limited to research institutes and foundations that are part of or affiliated with a U.S. institution of higher education. For-profit colleges, universities, trade schools, and hospitals are ineligible. Nonprofit organizations described in Section 501(c) (4) of the Internal Revenue Code that lobby are not eligible to apply.

Foreign governments, international organizations, and non-governmental international organizations/institutions are not eligible to apply.

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

Federal Agencies may not apply. Federal employees are not eligible to serve in a principal leadership role on an assistance agreement. 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.

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

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

B. Cost sharing

Institutional cost-sharing is not required for Phase I or Phase II grants.

C. Other

Applications must substantially comply with the application submission instructions and requirements set forth in Section IV of this announcement or they will be rejected. In addition, where a page limitation is expressed in Section IV with respect to parts of the application, pages in excess of the page limit will not be reviewed. In addition, applications must be submitted through Grants.gov as stated in Section IV of this announcement (except in the limited circumstances where another mode of submission is specifically allowed for as explained in Section IV) on or before the application submission deadline published in Section IV of this announcement. Applicants are responsible for following the submission instructions in Section IV of this announcement (see Section IV.F. "Submission Instructions for Phase I Applications and Other Submission Requirements" for further information) to ensure that their application is submitted timely. Applications submitted after the submission deadline will be considered late and deemed ineligible without further consideration unless the applicant can clearly demonstrate that it was late due to EPA mishandling or because of technical problems associated with Grants.gov or relevant SAM.gov system issues. An applicant's failure to timely submit their application through Grants.gov because they did not timely or properly register in SAM.gov or Grants.gov will not be considered an acceptable reason to consider a late submission.

Also, applications exceeding the funding limits or project period term described herein will be rejected without review. Further, applications that fail to demonstrate a public purpose of support or stimulation (e.g., by proposing research which primarily benefits a Federal program or provides a service for a Federal agency) will not be funded.

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

As mentioned above, the competitors for the P3 Phase II grants for further development and demonstration will be limited to those selected to receive support as a result of the competition under this RFA (Phase I).

IV. APPLICATION AND SUBMISSION INFORMATION

Additional provisions that apply to this solicitation and/or awards made under this solicitation, including but not limited to those related to confidential business information, contracts and subawards under grants, and proposal assistance and communications, can be found at https://www2.epa.gov/grants/epa-solicitation-clauses.

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

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

A. Grants.gov Submittal Requirements and Limited Exception Procedures

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

Mailing Address:
OGD Waivers
c/o Jessica Durand
USEPA Headquarters
William Jefferson Clinton Building
1200 Pennsylvania Ave., N. W.
Mail Code: 3903R
Washington, DC 20460

Courier Address:
OGD Waivers
c/o Jessica Durand
Ronald Reagan Building
1300 Pennsylvania Ave., N.W.
Rm # 51278
Washington, DC 20004

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

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

If an exception is granted, it is valid for submissions to EPA for the remainder of the entire calendar year in which the exception was approved and can be used to justify alternative submission methods for application submissions made through December 31 of the calendar year in which the exception was approved (e.g., if the exception was approved on March 1, 2020, it is valid for any competitive or non-competitive application submission to EPA through December 31, 2020). Applicants need only request an exception once in a calendar year and all exceptions will expire on December 31 of that calendar year. Applicants must request a new exception from required electronic submission through Grants.gov for submissions for any succeeding calendar year. For example, if there is a competitive opportunity issued on December 1, 2019 with a submission deadline of January 15, 2020, the applicant would need a new exception to submit through alternative methods beginning January 1, 2020.

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

B. Application Package Information

Use the application package available at Grants.gov (see Section IV.F. "Submission Instructions for Phase I Applications and Other Submission Requirements"). Note: With the exception of the current and pending support form (available at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms), all necessary forms are included in the electronic application package. Make sure to include the current and pending support form in your Grants.gov submission.

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

C. Content and Form of Application Submission

The application is made by submitting the materials described below. **Applications must contain all information requested and be submitted in the formats described.**

1. Standard Form 424

The applicant must complete Standard Form 424. Instructions for completion of the SF424 are included with the form. However, note that EPA requires that the entire requested dollar amount appear on the SF424, not simply the proposed first year expenses. The form must contain the signature of an authorized representative of the applying organization.

Applicants are required to provide a unique entity identifier (e.g., 'DUNS number') when applying for federal grants or cooperative agreements. Organizations may receive a unique entity identifier, at no cost, by calling the dedicated toll-free request line at 1-866-705-5711, or visiting the website at: https://www.dnb.com.

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

If EPA determines that Executive Order 12372 applies to a proposed application, the applicant must follow the procedures in 40 CFR Part 29. The applicant must notify their state's single point of contact (SPOC). To determine whether their state participates in this process, and how to comply, applicants should consult https://www.whitehouse.gov/omb/management/office-federal-financial-management/. If an applicant is in a State that does not have a SPOC, or the State has not selected research and development grants for intergovernmental review, the applicant must notify directly affected State, area wide, regional and local entities of its application.

EPA will notify the successful applicant(s) if Executive Order 12372 applies to its proposed application prior to award.

2. Key Contacts

The applicant must complete the "Key Contacts" form found in the Grants.gov application package. An "Additional Key Contacts" form is also available at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms. The Key Contacts form should also be completed for major sub-agreements (i.e., primary investigators). Do not include information for consultants or other contractors. Please make certain that all contact information is accurate.

3. EPA Form 4700-4, Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance (available at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms).

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

5. Abstract (2 pages)

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 P3 applications that receive funding will be posted on the P3 website.

The abstract should include the information described below (a-k). Examples of abstracts for previous P3 grants may be found on the P3 website.

a. Funding Opportunity Number and Research Area: Enter the full name of the solicitation *(18th Annual P3 Awards: A National Student Design Competition Focusing on People, Prosperity and the Planet)* and the funding opportunity number and associated research area under which you are submitting your application. The funding opportunity number and its associated research area are listed at the beginning of this announcement, in Section I.D. above, and in Section IV.C.10.b below.

Please note: Include the Funding Opportunity Number to which the application is being submitted in the upper right side of the "header" of the Abstract page. **Each application must be submitted using a single FON.** Within the selected research area, applicants should select one of the listed topics to be the focus of their project (see Section I.D). If applicants propose a project that does not address one of these topics, they may not be evaluated as highly during the relevancy review, and therefore may not be recommended for an award.

b. Project Title: Use the exact title of your project as it appears in the application. The title must be brief yet represent the major thrust of the project. Because the title will be used by those not familiar with the project, use more commonly understood terminology. Do not use general phrases such as "research on."

c. Principal Investigator (P.I.): This person will serve as the faculty advisor for the P3 student team. List the name of the PI and then the names and affiliations of any co-investigators/advisors who will significantly contribute to the project. Provide a web site URL or an email contact address for each investigator. Consider including people from departments and disciplines that will help make a successful project—e.g., from business, social science, and educational schools and departments.

d. Student Team: If student investigators are known at the time of application submittal, list them, indicate whether each student is an undergraduate or graduate student, and indicate the expertise they will contribute to the P3 team. If student investigators are not yet known, provide a brief explanation of how and when the P3 student team will be formed and the areas of expertise to be recruited for the team. Include in the team students from schools and disciplines that will help make a successful project—e.g., from business, social science, and educational schools or departments.

e. 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.

f. Student Represented Departments and Institutions: List the departments and institutions that will be represented by the students participating on the team.

g. 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.

h. Project Cost: Show the total funding requested from the EPA, including direct and indirect costs. (This cannot exceed $25,000).

i. Project Summary: Provide three subsections addressing:

Objective: Within the selected research area and topic, provide a definition of the technical challenge, describe how the proposed design will address the challenge, and identify the innovative scientific or technical aspects of the application. Explain how the project will benefit people—for example, those in small, rural, tribal and/or disadvantaged communities.
Description: Describe the project/design and how it relates to the P3 approach: people, prosperity and the planet. Also identify how the P3 Project will provide education on the project's purpose, approach, results, and implications at the university or community level.
Results: Identify the expected outputs/outcomes of the project and provide a description of the strategy for measuring results, evaluation and demonstration.

j. Contribution to Pollution Prevention or Control: Provide a brief statement describing how the proposed project/design will further the goals of pollution prevention and/or control.

k. Supplemental Keywords: Without duplicating terms already used in the text of the abstract, list keywords to assist database searchers in finding your research. A list of suggested keywords may be found at: https://www.epa.gov/research-grants/research funding-opportunities-how-apply-and required-forms.

6. Research Plan, Quality Assurance Statement, Human Subjects Research Statement, Scientific Data Management Plan, and References

a. Research Plan (12 pages)

Note: Please review the Evaluation Criteria presented in Section V.A. to ensure that your application addresses all of the criteria against which it will be evaluated by the external and internal reviewers.

This description must not exceed twelve (12) 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.

Divide your research plan into the following sections and label accordingly.

Section 1: Proposed Research

a. Challenge Definition

- Identify the research area and topic (see Section I.D) the project will address.

- Identify the technical challenge the team will research.
- Identify the research project's innovative aspects and describe how it challenges and shifts current research or engineering paradigms by using innovative theoretical concepts, approaches or methodologies, instrumentation or interventions applicable to one or more fields of research. Where appropriate, put the research in the context of current approaches (e.g., provide a literature review).

b. Research Description

- Describe the research and its goals and objectives.
- Describe the scientific/technical soundness and feasibility of the proposed design.
- Explain the plan for engaging intended end users—which may include those in small, rural, tribal and/or disadvantaged communities.
- State how the research relates to pollution prevention/control or link it to one of EPA's authorizing statutes provided in Section I.C.
- If the project has partners, describe their roles, responsibilities, and contributions to helping the project succeed*.

c. Results (outputs/outcomes), Evaluation and Demonstration

- Describe the expected outputs and the potential outcomes to society, the economy, and the environment (See Section I.D).
- Describe how the project supports the Agency's priorities described in Section I.D.
- Describe how progress toward achieving the expected outputs and social, economic and environmental outcomes will be tracked and measured.
- Explain how the research will be primarily performed in the U.S. and how the benefits of the research will primarily accrue to the U.S.

Section 2: Relationship of the Proposal to the P3 (People, Prosperity and the Planet) Approach

- Describe how the project embodies the P3 approach and seeks sustainable solutions that protect the environment, strengthen our communities, and create economic benefits. The Sustainability Primer (PDF) (2 pp, 195 K) provides examples of research activities that promote and incorporate sustainability principles.
- Describe how the proposed environmental and economic outcomes could benefit the intended users and/or society more generally.
- Describe the potential for implementation, adoption, concept transferability, and long-term viability of the research in the affected communities and elsewhere.

Section 3: Educational and Interdisciplinary Aspects of Research

- Identify the educational benefits of the research.
- Provide a plan for teaching the P3 approach that includes a description of the STEM education ecosystem that would be supported or developed as a result of the P3-funded project.
- Identify the university, community, and/or other audiences who will be taught.
- Describe the teaching methods and materials.

- Clearly identify the planned mix of disciplines to be represented on the team, including both the undergraduate and graduate student members and the PI and co-investigators/advisors.
- Identify any stakeholders, including members, in the STEM education ecosystem and the role of the applicant in the ecosystem.

Section 4: Project Management

- Provide schedules for key milestones and project tasks.
- Provide the areas of expertise/experience to be represented on the project team.
- Discuss facilities and other resources available for the project.
- Detail how project objectives will be successfully achieved within the grant period and describe the approach, procedures and controls for ensuring that grant funds will be expended in a timely and efficient manner.
- Describe how the project will be managed, including the roles and responsibilities of all faculty and team members.

* Partnerships are strongly encouraged and will be particularly important for the demonstration strategies. While formal partnerships need not be established prior to submitting the application, indicate any and all anticipated partnerships including the type of partner (educational institution, industry and/or NGOs). Formal letters of understanding or commitment from any and all partners should be submitted in support of the application, when available and appropriate and will be considered letters of intent/support as described in Section IV.C.10.a. below. If the applicant does not intend to partner with other groups in the performance of the project, the applicant must demonstrate how it will be able to effectively perform and complete the project without such partnership.

b. Quality Assurance Statement (1 page)

For projects involving environmental data collection or processing, conducting surveys, modeling, method development, or the development of environmental technology (whether hardware-based or via new techniques), provide a brief Quality Assurance Statement (QAS). The QAS for Phase I proposals should be no more than one page. The QAS should discuss the plans for processes (quality control [QC] activities) that will be used to ensure that the products of the research satisfy the intended project objectives.

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

c. EPA Human Subjects Research Statement (HSRS) (4 pages)

Human subjects research supported by the EPA is governed by EPA Regulation 40 CFR Part 26 (Protection of Human Subjects). This includes the Common Rule at subpart A and prohibitions and additional protections for pregnant women and fetuses, nursing women and children at subparts B, C and D. While retaining the same notation, subparts B, C and D are substantively different in 40 CFR Part 26 than in the more commonly cited 45 CFR 46. Particularly noteworthy is that research meeting the regulatory definition of intentional exposure research found in subpart B is prohibited by that subpart in pregnant women, nursing women and children. Research meeting the regulatory definition of observational research (any research that is not intentional exposure research) found in subparts C and D is subject to the additional protections found in those subparts for pregnant women and fetuses (subpart C) and children (subpart D). These subparts also differ markedly from the

language in 45 CFR 46. For more information, please see: https://www.epa.gov/osa/basic-information-about-human-subjects-research-0.

Procedures for the review and oversight of human research subject to 40 CFR Part 26 are also provided in EPA Order 1000.17A (https://www.epa.gov/osa/epa-order-100017-policy-and-procedures-protection-human-research-subjects-epa-conducted-or). 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 (https://nepis.epa.gov/Exe/ZyPDF.cgi/P10012LY.PDF?Dockey=P10012LY.PDF) and grant approval only to studies that adhere to those principles.

All applications submitted under this solicitation must include a HSRS as described below. For more information about what constitutes human subjects research, please see: https://www.epa.gov/osa/basic-information-about-human-subjects-research-0. For information on the prohibition on the inclusion of vulnerable subjects in intentional exposure research, please see: https://www.epa.gov/osa/basic-information-about-human-subjects-research-0.

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

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

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

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

• Describe and justify the proposed involvement of human subjects in the work outlined in the Research Strategy section.
• Describe the characteristics of the subject population, including their anticipated number, age range and health status, if relevant.
• Describe and justify the sampling plan, including retention strategies and the criteria for inclusion or exclusion of any subpopulation.
• Explain the rationale for the involvement of special vulnerable populations, such as pregnant women, children or others who may be considered vulnerable populations.
• If relevant to the proposed research, describe procedures for assignment to a study group. As related to human 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 the EPA regulations, Subparts B-D, must include additional protections. Refer to EPA guidance:

- Prohibition of Research Conducted or Supported by EPA Involving Intentional Exposure of Human Subjects who are Children or Pregnant or Nursing Women
  https://www.epa.gov/osa/basic-information-about-human-subjects-research-0

- Additional Protections for Pregnant Women and Fetuses Involved as Subjects in Observational Research Conducted or Supported by EPA

  https://www.epa.gov/osa/basic-information-about-human-subjects-research-0

- Additional Protections for Children Involved as Subjects in Observational Research Conducted or Supported by EPA

  https://www.epa.gov/osa/basic-information-about-human-subjects-research-0

• Where appropriate, discuss plans for ensuring necessary medical or professional intervention in the event of adverse effects to the subjects. Studies that involve clinical trials must include a general description of the plan for data and safety monitoring of the clinical trials and adverse event reporting to the IRB, the DSMB (if one has been established for the trial), the EPA and others, as appropriate, to ensure the safety of subjects.

3. Potential Benefits of the Proposed Research to Human Subjects and Others
   • Discuss the potential benefits of the research to research participants and others.
   • Discuss why the risks to subjects are reasonable in relation to the anticipated benefits to research participants and others.
   • Please note that financial compensation of subjects is not considered to be a benefit of participation in research.
4. Importance of the Knowledge to be Gained
   • Discuss the importance of the knowledge to be gained as a result of the proposed research.
   • Discuss why the risks to subjects are reasonable in relation to the importance of the knowledge that reasonably may be expected to result.

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

d. Scientific Data Management Plan (2 pages)

Applications submitted in response to this solicitation must 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 must 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 IV 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 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 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 V 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 IV 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 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.

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

7. Budget and Budget Justification

a. Budget

Prepare a master budget table using "SF-424A Budget Information for Non-Construction Programs" (aka SF-424A), available in the Grants.gov electronic application package and also at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms. Only complete "Section B-Budget Categories". Provide the object

class budget category (a. - k.) amounts under the "Grant Program, Function or Activity" heading. Each column reflects a separate budget year. Since P3 Phase I grants are one-year grants you will only need to fill in the Year 1 column which will automatically be copied into the total budget column (Column 5).

Applicants may not use subagreements to transfer or delegate their responsibility for successful completion of their EPA assistance agreement. Please refer to https://www2.epa.gov/grants/epa-solicitation-clauses#Contracts and Subawards if your organization intends to identify specific contractors, including consultants, or subrecipients in your application.

Please note that institutional cost-sharing is not required and should not be included.

The budget must include expenses for the P3 team, or representatives of the P3 team, to travel in the summer of 2022 to the National Student Design Expo, which will be held in a major East Coast city. Applicants should budget for travel to the Expo, however EPA is monitoring the COVID-19 pandemic and if it is still impacting in-person meetings, a virtual Expo will be planned. PIs will be notified in advance if the National Student Design Expo moves from in-person to virtual.

b. Budget Justification *[3 pages in addition to the Section IV.C.6 page limitations]*

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. The budget justification should not exceed three consecutively numbered (bottom center), 8.5x11-inch pages of single-spaced, standard 12-point type with 1-inch margins. EPA provides detailed guidance on preparing budgets and budget justifications in the Agency's Interim General Budget Development Guidance for Applicants and Recipients of EPA Financial Assistance.

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

(1) Personnel: List all staff positions by title. Give annual salary, percentage of time assigned to the project, total cost for the budget period, project role and specify any annual cost of living adjustments. Compensation paid for employees engaged in grant activities must be consistent with payments for similar work within the applicant organization. Note that for salaries to be allowable as a direct charge to the award, a justification of how that person will be directly involved in the project must be provided. General administrative duties such as answering telephones, filing, typing or accounting duties are not considered acceptable.

Below is a sample computation for Personnel:

Position/Title	**Annual Salary**	**% of Time Assigned to Project**	**Cost**
Project Manager	$50,000	2%	$1,000
Total Personnel			**$1,000**

Note this budget category is limited to persons employed by the applicant organization ONLY. Please specify if students are considered employees of the university. Those employed elsewhere are classified as subawardees, program participants, contractors or consultants. Contractors and consultants should be listed

under the "Contractual" budget heading. Subawards made to eligible subrecipients are listed under the "Other" budget heading. Participant support costs such as stipends or travel assistance for trainees (e.g. interns or fellows) are listed under the "Other" budget heading.

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

Below is a sample computation for Fringe Benefits:

Position/Title	**Base Fringe % Rate**	***Year 1***	**Total**
Project Manager	47.22%	$472	$472

(3) Travel: In a table format, specify the estimated number of trips, purpose of each trip, number of travelers per trip, destinations and other costs for each type of travel for applicant employees. Travel costs for program participants should be specified in the "Other" budget category. Explain the need for any travel, paying particular attention to travel outside the United States. Foreign travel includes trips to Mexico and Canada but does not include trips to Puerto Rico, the U.S. territories or possessions. **If EPA funds will not be used for foreign travel, the budget justification must expressly state that the applicant will not use EPA funds for foreign travel without approval by EPA.**

Please designate if students are considered employees of the university. If they are not, then costs should be moved to Participant Support Costs, which is a subcategory under Other. If they are considered employees, please state so and leave the costs under Travel. Please provide an amount for conference registration. It is understood that the amount is an estimation.

Below is a sample computation for Travel:

Purpose of Travel	**Location**	**Item**	**Computation**	**Cost**
EPA P3 Travel	East Coast City	Lodging	1 rooms x $200 x 2 nights	$400
		Airfare	1 round trip at $528	$528
		Per Diem	3 days at $74	$222
Total Travel:				**$1150**

Total travel: $1150

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

brands of equipment should not be identified. General-purpose equipment (office equipment, etc.) must be justified as to how it will be used on the project. (Property items with a unit cost of less than $5,000 are considered supplies).

(5) Supplies: "Supplies" are tangible property other than "equipment" with a per item acquisition cost of less than $5,000. Include a brief description of the supplies required to perform the work. Costs should be categorized by major supply categories (e.g. office supplies, computing devices, monitoring equipment) and include the estimated costs by category.

Sample description for Supplies:
An estimated $xxxx is needed for materials and tools to construct a prototype as well as purchasing testing materials for a bench-scale model. Supplies (e.g., reagents, buffers) will be needed to determine optimum operating conditions (e.g., temperature, airflow).

Table 2: Materials and supplies cost (List each item and unit cost)

Total Supplies: $xxxx

(6) Contractual: List the proposed contractual activities along with a brief description of the scope of work or services to be provided, the proposed duration of the contract/procurement, the estimated cost and the proposed procurement method (competitive or non-competitive). **Any procurement of services from individual consultants or commercial firms (including space for workshops) must comply with the competitive procurement requirements of 2 CFR Part 200.317-200.326. Please see https://www2.epa.gov/grants/epa-solicitation-clauses#Contracts and Subawards for more details.** EPA provides detailed guidance on procurement requirements in the Agency's Best Practice Guide for Procuring Services, Supplies, and Equipment Under EPA Assistance Agreements.

Examples of Contractual costs include:

i. Consultants – Consultants are individuals with specialized skills who are paid at a daily or hourly rate. EPA's participation in the salary rate (excluding overhead) paid to individual consultants retained by recipients or by a recipient's contractors or subcontractors is limited to the maximum daily rate for a Level IV of the Executive Schedule (formerly GS-18), to be adjusted annually.

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

(7) Other: List each item in sufficient detail for the EPA to determine the reasonableness of its cost relative to the research to be undertaken. "Other" items may include equipment rental, telephone service and utilities and photocopying costs. Note that subawards, such as those with other universities or nonprofit research institutions for members of the research team, are included in this category. **Provide the total costs proposed for subawards as a separate line item in the budget justification and brief description of the activities to be supported for each subaward or types of subawards if the subrecipients have not been identified.** Subawards may not be used to acquire services from consultants or commercial firms. Please see https://www2.epa.gov/grants/epa-

solicitation-clauses#Contracts and Subawards for more details. The "Other" budget category also includes participant support costs such as stipends or travel assistance for trainees (e.g. interns or fellows). **Provide the total costs proposed for participant support costs as a separate line item in the budget justification and brief description of the costs. If EPA funds will not be used for foreign travel by program participants, the budget justification must expressly state that the applicant will not use EPA funds for foreign travel without approval by EPA.**

Sample Description for Participant Support Costs (PSC):
Estimated travel cost for six students to attend the 2022 EPA P3 National Student Design Expo in a major East Coast city is $xxxx, as shown below.

Non-Employee Travel Expenses *(examples only!)*

Purpose of Travel	Location	Item	Computation	Cost
EPA P3 Travel	East Coast City	Lodging	2 rooms x $200 x 2 nights	$800
		Airfare	6 people x $528	$3168
		Per Diem	6 people x $74 x 3 days	$1332
Total PSC Travel:				$5300

No international travel will occur without approval from the EPA.

Total Participant Support Costs: $5300

A. **Facilities rental** (if any):
This project will be based at (facility). (Explain rental cost)
B. **Shipping**, (if any): (Note:
This includes shipping a prototype to the Expo.)
C. **Analysis**, (if any):
For work such as sample analysis or fabrication done by the recipient institution.

(8) Indirect Costs: For additional information pertaining to indirect costs, please see the IDC Competition Clause at Additional Provisions for Applicants Incorporated into the Solicitation.

8. Resumes

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

Alternative to a standard resume, you may use a profile such as an NIH BioSketch that can be generated in SciENcv (see https://grants.nih.gov/grants/forms/biosketch.htm for information on the BioSketch; also see https://www.nlm.nih.gov/pubs/techbull/so13/so13_sciencv.html for information on SciENcv). These materials should generally conform to the requirements for a resume (e.g., content and page number).

9. Current and Pending Support

Complete a current and pending support form (provided at https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms) for each investigator and important co-worker. Do not include current and pending support for consultants or other contractors. Include all current and pending research regardless of source.

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

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

10. Guidelines, Limitations, and Additional Requirements

a. Letters of Intent/Letters of Support

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

Letters of support do not commit a resource vital to the success of the 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 12-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 https://www2.epa.gov/grants/epa-solicitation-clauses#Contracts and Subawards.

b. Funding Opportunity Number(s) (FON) and Research Areas

At various places in the application, applicants are asked to identify the FON. Applicants must select the FON corresponding to their proposed research topic area. It is the responsibility of the applicant to identify the proper FON based on the nature of the proposed research. Failure to do so could result in an inappropriate peer review assignment. If your research seems to fit under more than one FON, choose the most appropriate one. **Each application must be submitted using a single FON. Applicants should identify one topic within that research area that will be the focus of their project (see Section I.D). If applicants propose a project that does not address**

one of these topics, they may not be evaluated as highly during the relevancy review, and therefore may not be recommended for an award.

The Funding Opportunity Numbers and associated research areas for this RFA are:

18th Annual P3 Awards: A National Student Design Competition Focusing on People, Prosperity and the Planet

EPA-G2021-P3-Q1 – Air Quality
EPA-G2021-P3-Q2 – Safe and Sustainable Water Resources
EPA-G2021-P3-Q3 – Sustainable and Healthy Communities
EPA-G2021-P3-Q4 – Chemical Safety

Additional detail for each FON is provided above in Section I.D.

c. Confidentiality

By submitting an application in response to this solicitation, the applicant grants the EPA permission to make limited disclosures of the application to technical reviewers both within and outside the Agency for the express purpose of assisting the Agency with evaluating the application. Information from a pending or unsuccessful application will be kept confidential to the fullest extent allowed under law; information from a successful application may be publicly disclosed to the extent permitted by law.

D. Submission Dates and Times

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

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

Solicitation Closing Date: **February 9, 2021** 11:59:59 pm Eastern Time (applications ***must*** be submitted to Grants.gov by this time, see Section IV.F "Submission Instructions for Phase I Applications and Other Submission Requirements" for further information).

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

E. Funding Restrictions

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

progress through annual reports (under Phase II) provided by grantees and other contacts with the Principal Investigators.

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

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

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

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

F. Submission Instructions for Phase I Applications and Other Submission Requirements

Please read this entire section before attempting an electronic submission through Grants.gov.

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

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

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

Applicants need to ensure that the AOR who submits the application through Grants.gov and whose unique entity identifier (e.g., DUNS number) is listed on the application is an AOR for the applicant listed on the application. Additionally, the DUNS number listed on the application must

be registered to the applicant organization's SAM account. If not, the application may be deemed ineligible.

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

You may also be able to access the application package for this announcement by searching for the opportunity on https://www.grants.gov/. Go to https://www.grants.gov/ and click "Search Grants" at the top of the page and enter the Funding Opportunity Number, EPA-G2021-P3-Q1, Q2, Q3, or Q4, or the Assistance Listing number that applies to the announcement (66.516), in the appropriate field under "Basic Search Criteria" and click the Search button.

Note: All applications must now be submitted through Grants.gov using the "Workspace" feature. Information on the Workspace feature can be found at the Grants.gov Workspace Overview Page.

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

3. Application Package Preparation: Your organization's AOR must submit your complete application package electronically to EPA through Grants.gov (https://www.grants.gov/) no later than **February 9, 2021**, 11:59:59 pm Eastern Time. Please allow for enough time to successfully submit your application and allow for unexpected errors that may require you to resubmit.

Please submit all of the application materials described below using the Grants.gov application package accessed using the instructions above.

The application package consists of the following mandatory documents.

(a) Application for Federal Assistance (SF 424): Complete the form except for the "competition ID" field.

(b) EPA Key Contacts Form 5700-54: Complete the form. If additional pages are needed, see (e) below.

(c) EPA Form 4700-4, Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance: Complete the form.

(d) SF-424A, Budget Information for Non-Construction Programs: Only complete "Section B-Budget Categories". Provide the object class budget category (a. - k.) amounts under the "Grant Program, Function or Activity" heading. Each column reflects a separate budget year. Since P3 Phase I grants are one-year grants you will only need to fill in the Year 1 column which will automatically be copied into the total budget column (Column 5).

(e) Project Narrative Attachment Form (click on "Add Mandatory Project Narrative"): Attach a single electronic PDF file labeled "Application" that contains the items described in Section IV.C.4. through IV.C.10.a [Table of Contents, Abstract, Research Plan, Quality Assurance Statement, Human Subjects Research Statement, Scientific Data Management Plan, References, Budget Justification, Resumes, Current and Pending Support, and Letters of Intent/Support] of this solicitation. *In order to maintain format integrity, this file must be submitted in Adobe Acrobat PDF.* Please review the PDF file for conversion errors prior to including it in the electronic application package; requests to rectify conversion errors will not be accepted if made after the solicitation closing date and time. If Key Contacts Continuation pages (see https://www.epa.gov/research-grants/research-funding-opportunities-how-apply-and-required-forms) are needed, place them before the EPA Form 4700-4, Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance (Section IV.C.3.).

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

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

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

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

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

Be aware that EPA will only consider accepting applications that were unable to transmit due to Grants.gov or relevant www.Sam.gov system issues or for unforeseen exigent circumstances, such

as extreme weather interfering with internet access. Failure of an applicant to submit timely because they did not properly or timely register in SAM.gov or Grants.gov is not an acceptable reason to justify acceptance of a late submittal.

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

(a) If you are experiencing problems resulting in an inability to upload the application to Grants.gov, it is essential to call Grants.gov for assistance at 1-800-518-4726 before the application deadline. Applicants who are outside the U.S. at the time of submittal and are not able to access the toll-free number may reach a Grants.gov representative by calling 606-545-5035. Be *sure* to obtain a case number from Grants.gov. If the problems stem from unforeseen exigent circumstances unrelated to Grants.gov, such as extreme weather interfering with internet access, contact Debra M. Jones (jones.debram@epa.gov).

(b) Unsuccessful transfer of the application package: If a successful transfer of the application cannot be accomplished even with assistance from Grants.gov due to electronic submission issues or unforeseen exigent circumstances, send an email message to Debra M. Jones (jones.debram@epa.gov) by 11:59:59 pm Eastern Time on the solicitation closing date. The email message must document the problem and include the Grants.gov case number as well as the entire application in PDF format as an attachment.

(c) Grants.gov rejection of the application package: If a notification is received from Grants.gov stating that the application has been rejected for reasons other than late submittal, promptly send an email to Debra M. Jones (jones.debram@epa.gov) with the FON in the subject line within one business day of the closing date of this solicitation. The email should include any materials provided by Grants.gov and attach the entire application in PDF format.

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

G. Submission Instructions for Phase II Applications

Additional submission instructions for the Phase II competition will be provided to the Phase I awardees in the award terms and conditions.

Those receiving funding via a P3 Phase I grant are encouraged to apply for funding for a Phase II grant. Phase II applications require many of the same documents as submitted for the Phase I grant. Phase II awards are separate grant awards. The application for a P3 Phase II grant, which is a component of the Phase I *Project Report*, will be due in 2022.

V. APPLICATION REVIEW INFORMATION

A. Review Process for Phase I Applications

1. External Peer Review

All eligible grant applications are reviewed by appropriate external technical peer reviewers based on the criteria and process described below. This review is designed to evaluate each application

according to how well it meets the criteria listed below. The individual external peer reviewers include non-EPA scientists, engineers, social scientists and/or economists who are accomplished in their respective disciplines and proficient in the technical subjects they are reviewing.

Prior to the external technical peer review panel meeting, all reviewers will receive electronic copies of all applications, as well as a full set of abstracts for the applications. Each application will be assigned to a minimum of three primary peer reviewers, one of whom will be assigned the role of Rapporteur. Each reviewer will be assigned up to approximately 10 applications on which to serve as a primary reviewer. During the review period leading up to the panel meeting, primary reviewers will read the full set of abstracts and entire application package for each application they are assigned. They will also prepare a written individual evaluation for each assigned application that addresses the peer review criteria described below and rate the application with a score of Highly Recommend, Recommend, or Not Recommend.

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

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

2. Criteria for External Peer Review of Phase I Applications

All eligible grant applications for Phase I awards will be peer reviewed by an external peer review panel based on the criteria below. Each of the four criteria categories are equally weighted.

a. **Application Quality** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the application includes a design that is scientifically/technically sound and feasible; clearly expresses its innovative aspects (supported by a literature review where appropriate) and challenges and shifts current research or engineering paradigms by using innovative theoretical concepts, approaches or methodologies, instrumentation or interventions applicable to one or more fields of research (see Section I.D for definition of innovation for purposes of this RFA); lists clear, achievable goals, and objectives; identifies and suitably engages end users; and if partners are identified, describes their roles, responsibilities, and contributions to helping the project succeed. Applicants that do not plan on partnering with other groups in the performance of the project will be evaluated based on the extent to which they demonstrate how they will be able to effectively perform and complete the project without such partnership.

b. **Relationship of the Proposal to the P3 Approach** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the proposed research

embodies the P3 approach and offers solutions that protect the environment, strengthen communities, and create economic benefits; demonstrates how its environmental and economic outcomes will benefit the intended users and/or society; and describes its potential for implementation, adoption, transferability and long-term viability in the affected communities and elsewhere. (See Section I.D for definition of sustainability for purposes of this RFA. The sustainability primer, https://www.epa.gov/sites/production/files/2015-05/documents/sustainability_primer_v9.pdf, describes sustainability concepts in more detail).

c. **Educational and Interdisciplinary Aspects of Research** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the project clearly identifies the educational benefits of the research; provides a plan for teaching the P3 approach that includes a description of the STEM education ecosystem that would be supported or developed as a result of the P3-funded project; identifies the university, community, and/or other audiences who will be taught; adequately describes the teaching methods and materials; and clearly identifies the planned mix of disciplines to be represented on the team, including both the undergraduate and graduate student members and the PI and co-investigators/advisors; identifies stakeholders, including members, in the STEM education ecosystem and the role of the applicant in the ecosystem.

d. **Budget and Project Management** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the application provides a reasonable and appropriate budget; includes adequate approaches, procedures and controls for ensuring timely and efficient expenditure of awarded grant funds; adequately describes expertise/experience to be represented on the project team; describes facilities and other resources to be used on the project; provides a schedule with milestones and demonstrates the project will be adequately managed to ensure timely and successful achievement of project objectives; provides an adequate QA statement; describes how progress toward achieving outputs and social, economic, and environmental outcomes will be tracked and measured; and describes how the project will be managed, including the roles and responsibilities of all faculty and team members.

3. Relevancy Review

Applications receiving final peer review scores of Highly Recommend or Recommend will then undergo an internal relevancy review, as described below, conducted by experts from the EPA, including individuals from the Office of Research and Development (ORD). All other applications are automatically declined. The purpose of the relevancy review is to ensure an integrated research portfolio for the Agency and help determine which applications to recommend for award.

Prior to the relevancy review panel meeting, all relevancy reviewers will receive electronic copies of all applications that passed peer review as well as a full set of abstracts for the applications. Each application will be assigned to a minimum of three primary relevancy reviewers, one of whom will be assigned the role of Rapporteur. Each reviewer will be assigned up to approximately 10 applications on which to serve as a primary relevancy reviewer. During the review period leading up to the relevancy review panel meeting, all reviewers will be instructed to read the full set of abstracts and the entire application package for each application they are assigned. They will also prepare a written individual evaluation for each assigned application that addresses the relevancy review criteria described below and rate the application with a score of A, high relevance to EPA mission; B, relevant to EPA mission; C, moderately relevant to EPA mission; D, possibly relevant to EPA mission; or E, not relevant to EPA mission.

All applications that pass peer review will be discussed by the relevancy review panel with the Rapporteur initiating the discussion. If the primary relevancy reviewers revise their initial scores after the discussion by the panel they will document the reasons for the revisions. After the discussion, the primary relevancy reviewers will provide their final score for the applications they are assigned. The final ratings of the primary reviewers will then be translated by EPA into the final relevancy review score (A, B, C, D, or E) for the application.

The final relevancy review score (A, B, C, D, or E) and final peer review score (Highly Recommend or Recommend) will be used to place each application in one of 6 ranking tiers: Tier 1 = A/ Highly Recommend; Tier 2 = A/Recommend or B/ Highly Recommend; Tier 3 = B/Recommend or C/Highly Recommend; Tier 4 = C/Recommend or D/Highly Recommend; Tier 5 = D/Recommend; Tier 6 = E/Highly Recommend or E/Recommend.

The internal relevancy review panel will assess the relevancy of the proposed research to the EPA's mission and priorities based on the following criteria that are listed in descending order of importance (i.e., Criterion a. has the heaviest weight):

a. The degree to which the proposed research is relevant to EPA's priorities (as described in Goal 3: Greater Certainty, Compliance, and Effectiveness, Objective 3.3: Prioritize Robust Science, of the EPA's FY2018-2022 Strategic Plan) supporting robust science for:

- Air Quality;
- Safe and Sustainable Water Resources;
- Sustainable and Healthy Communities; or
- Chemical Safety

b. The degree to which the research is primarily performed in the U.S. and the benefits of the research primarily accrue to the U.S.

c. The degree to which the project focuses on one of the topics listed under the research area selected in Section I.D.

4. Past Performance History Review

Those applicants who received final scores of Highly Recommend or Recommend as a result of the peer review process will also be asked to provide additional information for the past performance history review pertaining to the proposed PI's "Past Performance and Reporting History." The applicant must provide the EPA with information on the proposed PI's past performance and reporting history under prior Federal agency assistance agreements (assistance agreements include grants and cooperative agreements but not contracts) in terms of: (i) the level of success in managing and completing each agreement, (ii) history of meeting the reporting requirements and documenting progress towards achieving the expected results (outputs/outcomes) under each agreement and (iii) 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.

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

Past performance history review scores are satisfactory (S), nothing to report (NTR) or unsatisfactory (U). For purposes of consideration of an award, scores of S will be considered favorable, NTR will be considered neither favorable nor unfavorable and scores of U will be considered unfavorable and unlikely to result in an award recommendation. Scores of S and U

must be justified by the reviewer, with scores of U clearly documented to explain why past performance history cannot be considered satisfactory.

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

1. Name of Granting Agency
2. Grant/Cooperative agreement number
3. Grant/Cooperative agreement title
4. Grantee Institution
5. Brief description of the grant/cooperative agreement
6. A description of how the agreement is similar in size and scope to the proposed project and whether or not it was successfully managed and completed; if not successfully managed and completed, provide an explanation
7. Information relating to the proposed 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 the past performance history factor, 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). **If you do not have any relevant or available past performance or past reporting information, please indicate this in your response and you will receive a nothing to report (NTR) score for these factors. If you do not provide any response for these items, you may receive an unsatisfactory (U) score for these factors.**

The past performance history review will be conducted by the EPA and will assess the following criteria which are of equal weight:

1. History of successfully managing and completing these prior Federal assistance agreements, including whether there is a satisfactory explanation for any lack of success.

2. History in meeting reporting requirements under the prior agreements and reporting progress toward achieving results (outputs/outcomes) under these agreements, including the proposed 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. Any explanation of why progress toward achieving the results was not made will also be considered.

3. 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 PI adequately explained why not, or the PI explained why the requirement does not apply.

B. Review Process for Phase II Applications

1. External Peer Review

It is expected that Phase II projects/designs will be evaluated in accordance with the process and criteria described below. Phase II applicants will be notified if any changes are made to the review process or criteria. All Phase II projects/designs will be evaluated by external technical peer reviewers made up of non-EPA scientists, engineers, social scientists, economists and/or other professionals who are accomplished in their respective disciplines and proficient in the technical subjects they are evaluating. All Phase I teams will submit a written Project Report which will summarize their Phase I activities and include their proposed Phase II activities. All Phase II projects/designs are reviewed by appropriate external technical peer reviewers based on the criteria and process described below.

Prior to the external technical peer review panel meeting, all reviewers will receive electronic copies of all applications, as well as a full set of abstracts for the applications. Each application will be assigned to a minimum of three primary peer reviewers, one of whom will be assigned the role of Rapporteur. Each reviewer will be assigned up to approximately 10 applications on which to serve as a primary reviewer. During the review period leading up to the panel meeting, primary reviewers will read the full set of abstracts and entire application package for each application they are assigned. They will also prepare a written individual evaluation for each assigned application that addresses the peer review criteria described below and rate the application with a score of Highly Recommend, Recommend or Not Recommend.

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

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

2. Criteria for External Peer Review of Phase II Applications

The external technical peer reviewers will base their evaluations of the written Project Report on the criteria below. Each of the four criteria categories are equally weighted.

a. **Application Quality** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the application includes a

design that is scientifically/technically sound and feasible; clearly expresses its innovative aspects (supported by a literature review where appropriate) and challenges and shifts current research or engineering paradigms by using innovative theoretical concepts, approaches or methodologies, instrumentation or interventions applicable to one or more fields of research; lists clear, achievable goals and objectives; identifies and suitably engages end users; and if partners are identified, describes their roles, responsibilities and contributions to helping the project succeed. Applicants that do not plan on partnering with other groups in the performance of the project will be evaluated based on the extent to which they demonstrate how they will be able to effectively perform and complete the project without such partnership.

b. **Relationship of the Proposal to the P3 Approach** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the proposed research embodies the P3 approach and offers solutions that protect the environment, strengthen communities, and create economic benefits; demonstrates how its environmental and economic outcomes will benefit the intended users and/or society; and describes its potential for implementation, adoption, transferability and long-term viability in the affected communities and elsewhere. The sustainability primer, https://www.epa.gov/sites/production/files/2015-05/documents/sustainability_primer_v9.pdf, describes sustainability concepts in more detail.

c. **Educational and Interdisciplinary Aspects of Research** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the project clearly identifies the educational benefits of the research; provides a plan for teaching the P3 approach that includes a description of the STEM education ecosystem that would be supported or developed as a result of the P3-funded project ; identifies the university, community, and/or other audiences who will be taught; adequately describes the teaching methods and materials; and clearly identifies the planned mix of disciplines to be represented on the team, including both the undergraduate and graduate student members and the PI and co-investigators/advisors; identifies stakeholders, including members, in the STEM education ecosystem and the role of the applicant in the ecosystem.

d. **Budget and Project Management** (the subcriteria identified within this criteria are essentially equally weighted) – The degree to which the application provides a reasonable and appropriate budget; includes adequate approaches, procedures, and controls for ensuring timely and efficient expenditure of awarded grant funds; adequately describes expertise/experience to be represented on the project team; describes facilities and other resources to be used on the project; provides a schedule with milestones and demonstrates the project will be adequately managed to ensure timely and successful achievement of project objectives; provides an adequate QA statement; describes how progress toward achieving outputs and social, economic, and environmental outcomes will be tracked and measured; and describes how the project will be managed, including the roles and responsibilities of all faculty and team members.

3. Relevancy Review

It is expected that Phase II projects/designs will be evaluated in accordance with the process and criteria described below. Phase II applicants will be notified if any changes are made to the review process or criteria. Applications receiving final peer review scores of highly recommend or recommend will then undergo an internal relevancy review, as described below, conducted by experts from the EPA, including individuals from the Office of Research and Development (ORD). All other applications are automatically declined. The purpose of the

relevancy review is to ensure an integrated research portfolio for the Agency and help determine which applications to recommend for award.

Prior to the relevancy review panel meeting, all relevancy reviewers will receive electronic copies of all applications that passed peer review as well as a full set of abstracts for the applications. Each application will be assigned to a minimum of three primary relevancy reviewers, one of whom will be assigned the role of Rapporteur. Each reviewer will be assigned up to approximately 10 applications on which to serve as a primary relevancy reviewer. During the review period leading up to the relevancy review panel meeting, all reviewers will be instructed to read the full set of abstracts and the entire application package for each application they are assigned. They will also prepare a written individual evaluation for each assigned application that addresses the relevancy review criteria described below and rate the application with a score of A, high relevance to EPA mission; B, relevant to EPA mission; C, moderately relevant to EPA mission; D, possibly relevant to EPA mission; or E, not relevant to EPA mission.

All applications that pass peer review will be discussed by the relevancy review panel with the Rapporteur initiating the discussion. If the primary relevancy reviewers revise their initial scores after the discussion by the panel, they will document the reasons for the revisions. After the discussion, the primary relevancy reviewers will provide their final score for the applications they are assigned. The final ratings of the primary reviewers will then be translated by EPA into the final relevancy review score (A, B, C, D, or E) for the application.

The final relevancy review score (A, B, C, D, or E) and final peer review score (Highly Recommend or Recommend) will be used to place each application in one of 6 ranking tiers: Tier 1 = A/ Highly Recommend; Tier 2 = A/Recommend or B/ Highly Recommend; Tier 3 = B/Recommend or C/Highly Recommend; Tier 4 = C/Recommend or D/Highly Recommend; Tier 5 = D/Recommend; Tier 6 = E/Highly Recommend or E/Recommend.

The internal relevancy review panel will assess the relevancy of the proposed research to the EPA's mission and priorities based on the following criteria that are listed in descending order of importance (i.e., Criterion a. has the heaviest weight):

a. The degree to which the proposed research is relevant to EPA's priorities (as described in Goal 3: Greater Certainty, Compliance, and Effectiveness, Objective 3.3: Prioritize Robust Science, of the EPA's FY2018-2022 Strategic Plan) supporting robust science for:
    - Air quality;
    - Safe and sustainable water resources;
    - Sustainable and healthy communities; or
    - Chemical safety

b. The degree to which the research is primarily performed in the U.S. and the benefits of the research primarily accrue to the U.S.

C. Human Subjects Research Statement (HSRS) Review

Phase I applications being considered for funding after the relevancy and past performance review that involve human subjects research studies will have their HSRS reviewed prior to award. The local EPA Human Subjects Officer (HSO) will review the information provided in the HSRS and the Research Plan to determine if the ethical treatment of human subjects is described in a manner appropriate for the project to move forward. The HSO may consult with

the EPA Human Subjects Research Review Official (HSRRO) as appropriate. The HSRRO may determine that an application cannot be funded if it is inconsistent with EPA's regulations at 40 CFR Part 26.

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

D. Evaluation of the Scientific Data Management Plan

EPA will evaluate the merits of the SDMPs for those Phase I and Phase II 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.

E. Funding Decisions

Phase I funding decisions are made by the ORD selection official based on the ranking tier, the past-performance history review, the evaluation of the SDMP, and, where applicable, the assessment of the applicant's human subjects research (see Section IV.C.6.c). In addition, in making the final funding decisions, the ORD selection official may also consider program balance and available funds. Applicants selected for funding will be required to provide additional information listed below under "Award Notices." The application will then be forwarded to EPA's Grants and Interagency Agreement Management Division for award in accordance with the EPA's procedures.

Phase II funding decisions are made by the ORD selection official based on the ranking tier, the evaluation of the SDMP, and, where applicable, the assessment of the applicant's human subjects research (see Section IV.C.6.c). In addition, in making the final funding decisions, the NCER Director may also consider program balance and available funds. Applicants selected for funding will be required to provide additional information listed below under "Award Notices."

The application will then be forwarded to EPA's Grants and Interagency Agreement Management Division for award in accordance with the EPA's procedures.

F. Additional Provisions for Applicants Incorporated into the Solicitation

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

VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices

Customarily, applicants are notified about evaluation decisions within six months of the solicitation closing date. Applicants to be recommended for funding will be required to submit additional certifications and an electronic version of the revised project abstract. They may also be asked to provide responses to comments or suggestions offered by the peer reviewers and/or submit a revised budget. EPA Project Officers will contact the PI to obtain these materials. Before or after an award, applicants may be required to provide additional quality assurance documentation.

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

B. Disputes

Assistance agreement competition-related disputes will be resolved in accordance with the dispute resolution procedures published in 70 FR (Federal Register) 3629, 3630 (January 26, 2005) which can be found at Grant Competition Dispute Resolution Procedures. Copies of these procedures may also be requested by contacting the person listed in Section VII of the announcement. Note, the FR notice references regulations at 40 CFR Parts 30 and 31 that have been superseded by regulations in 2 CFR parts 200 and 1500. Notwithstanding the regulatory changes, the procedures for competition-related disputes remains unchanged from the procedures described at 70 FR 3629, 3630, as indicated in 2 CFR Part 1500, Subpart E.

C. Administrative and National Policy Requirements

Additional provisions that apply to this solicitation and/or awards made under this solicitation, including but not limited to those related to unique entity identifier, SAM, copyrights, disputes, and administrative capability, can be found at https://www2.epa.gov/grants/epa-solicitation-clauses.

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

Expectations and responsibilities of ORD grantees and cooperative agreement recipients are summarized in this section, although the terms grants and cooperative agreements are used interchangeably.

1. Meetings: Principal Investigators will be expected to budget for, and present their research at a location to be determined in the eastern U.S. in the Summer of 2022. EPA is monitoring the COVID-19 pandemic and if it is still impacting in-person meetings, a virtual Expo will be planned. PIs will be notified in advance if the National Student Design Expo moves from in-person to virtual.

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

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

Guidance for investigators conducting EPA-funded research involving human subjects may be obtained here:
https://www.epa.gov/osa/basic-information-about-human-subjects-research-0
https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr26_main_02.tpl

4. Data Access and Information Release: EPA's requirements associated with data access and information release as well as copyrights, may be accessed here: https://www.epa.gov/grants/epa-solicitation-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 https://www.epa.gov/quality/guidelines-ensuring-and-maximizing-quality-objectivity-utility-and-integrity-information. These procedures may apply to data generated by grant recipients if those data are disseminated as described in the Guidelines.

5. Reporting:
A P3 Phase I grant recipient must agree to provide a written Project Report with an Executive Summary. A final report is also required if the project is extended beyond one year. A P3 Phase II grant recipient must agree to provide annual performance reports with associated summaries and a final report with an executive summary. The summaries will be posted on EPA's Research Grants website. The reports and summaries should be submitted electronically to the Technical Contact named in Section VII of this announcement.

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

6. Acknowledgement of EPA Support: EPA's full or partial support must be acknowledged in journal articles, oral or poster presentations, news releases, interviews with reporters and other communications. The acknowledgement 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.

VII. AGENCY CONTACTS

Further information, if needed, may be obtained from the EPA contacts indicated below. Information regarding this RFA obtained from sources other than these Agency Contacts may not be accurate. Email inquiries are preferred.

Technical Contact: Angela Page; phone: 202-564-7957; email: page.angelad@epa.gov
Eligibility Contact: Ron Josephson; phone: 202-564-7823; email: josephson.ron@epa.gov
Electronic Submissions Contact: Debra M. Jones; phone: 202-564-7839; email: jones.debram@epa.gov