

**U. S. DEPARTMENT OF ENERGY, OFFICE OF SCIENCE
INTEGRATED SUPPORT CENTER—CHICAGO OFFICE**

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM**

To be completed by "Applicant," i.e., organization with responsibilities for a "Federal action" involving application to DOE for a permit, license, exemption or allocation, or other similar actions. For assistance with this Form, refer to "Instructions for Preparing ISC-CH F-560, Environmental Evaluation Notification Form."

Solicitation/Award No. (if applicable): DE-SC0019106

Organization Name: QuesTek Innovations LLC
Evanston, IL

Proposed Action Title: Materials Genome Enabled Development of 3100 Capable Multilayer, Multicomponent Thermal and Environmental Barrier Coatings for CMCs

Total DOE Funding/Total Funding: \$224,939.00

I. Project Description: (Use explanation pages if additional space is required)

A. Proposed Project/Action (if applicable, delineate Federally funded/Non-Federally funded portions)

QuesTek will lead the overall STTR program with the long-term objective to design and develop unique compositions to enable the application of T/EBCs for higher temperature gas turbines. Prof. David Poerschke from University of Minnesota (UMN) will be the university partner conducting experiments to support the design of high performance T/EBCs based on his expertise in the area of high-temperature oxidation and the environmental protection challenges involved in implementing SiC-CMC technology in gas turbine systems.

B. Would the project proceed without Federal funding?

Yes No

If "yes," use explanation page.

II. Description of Affected Environment: (Use explanation pages if additional space is required)

The proposed research can directly enhance the success of DOE's Advanced Turbine Program, and the ability to obtain benefits from higher turbine combustion operating temperatures. This can help:

- Commercialize coal-fired Integrated Gasification Combined Cycle (IGCC) plants.
- Achieve greater energy efficiency and CO₂ reduction in other land-based gas turbines applications (e.g. utilities, industrial applications, and CHP).
- Achieve greater energy efficiency in aerospace transportation.
- Provide additional benefits in demanding materials environments, such as rocket engines.

III. Preliminary Questions:

- | | | |
|---|--------------------------|-------------------------------------|
| | Yes | No |
| A. <u>Is the DOE-funded work routinely administrative or <i>entirely</i> advisory or a "paper study?"</u> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

- B. Is there any potential whatsoever for: (Provide an explanation for each "Yes" response)

- | | | | |
|-----|---|--------------------------|-------------------------------------|
| 1. | Work to be performed outdoors? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. | Major modification of a building interior? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. | Threat of violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. | Siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. | Disturbance to hazardous substances, pollutants, or contaminants preexisting in the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. | The presence of any environmentally-sensitive resources? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. | Any potential whatsoever for high consequence impacts to human health or the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. | The work being connected to another existing/proposed activity that could potentially create a significant impact? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. | Nearby past, present, and/or reasonably foreseeable future actions such that collectively significant impacts could result? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. | Scientific or public controversy, uncertainty over potential impacts, or conflicts regarding resource usage? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "No" to ALL Section III.B. questions, go directly to Section V.

IV. Potential Environmental Effects: (Provide an explanation for each "Yes" response)

- A. Environmentally Sensitive Resources: Could the proposed action potentially result in changes and/or disturbances to any of the following resources?

- | | | | |
|-----|--|--------------------------|--------------------------|
| | Yes | No | |
| 1. | Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Other Protected Species (e.g., Burros, Migratory Birds, Pollinators) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. | Cultural or Historic Resources | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. | Important Farmland | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. | Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. | Class I Air Quality Control Region | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. | Special Sources of Groundwater (e.g. Sole Source Aquifer) | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. | Navigable Air Space | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. | Coastal Zones | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. | Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. | Floodplains and/or Wetlands | <input type="checkbox"/> | <input type="checkbox"/> |

- B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated items or activities?

- | | | | |
|-----|--|--------------------------|--------------------------|
| 13. | Natural Resource Damage Assessments | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. | Invasive Species or Exotic Organisms | <input type="checkbox"/> | <input type="checkbox"/> |
| 15. | Noxious Weeds | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. | Clearing or Excavation greater than one acre or Removal of Trees Governed by Local Requirement | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. | Dredge or Fill (under Clean Water Act, Section 404, greater than one acre) | <input type="checkbox"/> | <input type="checkbox"/> |

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated items or activities? (continued)

	Yes	No
18. Noise (in excess of regulations)	<input type="checkbox"/>	<input type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input type="checkbox"/>
20. Polychlorinated biphenyls (PCBs)	<input type="checkbox"/>	<input type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input type="checkbox"/>
22. Chemical Storage/Use	<input type="checkbox"/>	<input type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input type="checkbox"/>
26. Spill Prevention/Surface Water Protection	<input type="checkbox"/>	<input type="checkbox"/>
27. Underground Injection	<input type="checkbox"/>	<input type="checkbox"/>
28. Hazardous Waste	<input type="checkbox"/>	<input type="checkbox"/>
29. Underground Storage Tanks	<input type="checkbox"/>	<input type="checkbox"/>
30. Radioactive or Radioactive Mixed Waste	<input type="checkbox"/>	<input type="checkbox"/>
31. Radiation Exposure	<input type="checkbox"/>	<input type="checkbox"/>
32. Nanoscale Materials	<input type="checkbox"/>	<input type="checkbox"/>
33. Genetically Engineered Microorganisms/Plants or Synthetic Biology	<input type="checkbox"/>	<input type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input type="checkbox"/>
35. Greenhouse Gas Generation/Sustainability	<input type="checkbox"/>	<input type="checkbox"/>
36. Off-Road Vehicles	<input type="checkbox"/>	<input type="checkbox"/>
37. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input type="checkbox"/>
38. Research on Human Subjects or other Vertebrate Animals	<input type="checkbox"/>	<input type="checkbox"/>
39. Facility footprint exceeds 5,000 Square Feet	<input type="checkbox"/>	<input type="checkbox"/>

C. Other Relevant Information: Would the proposed action involve the following?

	Yes	No
40. Disproportionate Nearby Presence of Minority and/or Low Income Populations	<input type="checkbox"/>	<input type="checkbox"/>
41. Existing, Modified, or New Federal/State Permits	<input type="checkbox"/>	<input type="checkbox"/>
42. Involvement of Another Federal Agency (e.g. license/permit, funding, approval)	<input type="checkbox"/>	<input type="checkbox"/>
43. Action in a State with NEPA-type law	<input type="checkbox"/>	<input type="checkbox"/>
44. Expansion of Public Utilities/Services	<input type="checkbox"/>	<input type="checkbox"/>
45. Depletion of a Non-Renewable Resources	<input type="checkbox"/>	<input type="checkbox"/>
46. Subject to an Existing Institutional Work Planning and Control Process	<input type="checkbox"/>	<input type="checkbox"/>
47. Other Pertinent Information Which Could Impact Human Health or the Environment	<input type="checkbox"/>	<input type="checkbox"/>

V. Applicant certification that to the best of their knowledge all information provided on this form is accurate:

Does this disclosure contain: classified, sensitive business, or other exempt information that DOE would not be obligated to disclose pursuant to the Freedom of Information Act. Yes No

A. Organization Official (Name and Title): Voula Colburn, Contract Specialist

Signature: VColburn Date: 09AUG2018
 e-mail: vcolburn@questek.com Phone: 847-425-8215

B. Optional Secondary Approval (Name and Title): _____

Signature: _____ Date: _____
 e-mail: _____ Phone: _____

Remainder to be completed by DOE

VI. DOE Concurrence/Recommendation/Determination:

A. DOE Project Director/Program Manager or Contract/Grant Management Specialist:

Has the Applicant completed this Form correctly?
Does an existing generic categorical exclusion apply?

Yes No

If yes, indicate:

Name and Title: Hannah Gill Contract Specialist

Signature: [Handwritten Signature] Date: 08/15/2018

B. DOE NEPA Team Review (if requested):

Is the class of action identified in the DOE NEPA Regulations (Appendices A-D to Subpart D (10 CFR § 1021))?

Yes No

If yes, specify the class(es) of action: B3.6

Name and Title: _____

Signature: _____ Date: _____

C. DOE Counsel (if requested):

Name and Title: _____

Signature: _____ Date: _____

D. DOE NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR § 1021.410.

- Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.
- Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.
- Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/limitations if any:

NEPA Compliance Officer:

Name: Peter R. Siebach

Signature: [Handwritten Signature] Date: 8/17/2018