

**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-SC0020000

Organization Name: R-Display & Lighting LLC

Proposed Action Title: Novel Blue Phosphorescent Emitter Materials for OLED Lighting

Total DOE Funding/Total Funding: \$199,978

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

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

Organic Light Emitting Diode (OLED) panels manufactured for solid state lighting (SSL) currently use red and green phosphorescent emitter materials to achieve high light producing efficiency. However, less efficient blue fluorescent emitter materials are still used to achieve suitable stability for commercial applications. The department of energy SSL program has identified highly efficient and stable blue emitter materials as a major opportunity to advance the performance and subsequently commercial applications for OLED SSL panels. To address the blue emitter technology gap and product market opportunities, R-Display & Lighting (RDL) has developed a new class of highly efficient phosphorescent emitters designed for improved panel operational stability.

**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)**

All project operations will be executed indoors. Specifically, the synthetic operations will be conducted at Eastman Business Park research laboratories located in Rochester, NY. The laboratory meets guidelines for use of chemicals and disposal methods. A total of 4 workers will be involved in the laboratory operations. Workers will operate specific equipment in the laboratory to achieve the project objectives. The equipment includes regulated fume hoods, an inert glovebox, mechanical pumps and a tube furnace.

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"/> |
| <b><i>If "Yes", ensure that the description in Section I reflects this and go directly to Section V.</i></b>                   |                                     |                                     |
| B. <u>Is there any potential whatsoever for: (Provide an explanation for each "Yes" response)</u>                              |                                     |                                     |
| 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 checked="" type="checkbox"/> | <input 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. <u>Environmentally Sensitive Resources: Could the proposed action potentially result in changes and/or disturbances to any of the following resources?</u> | Yes                      | No                                  |
| 1. Threatened/Endangered Species and/or Critical Habitats   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds, Pollinators)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests)   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Cultural or Historic Resources   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Important Farmland   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Class I Air Quality Control Region   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Sole Source Aquifer)  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Navigable Air Space  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Coastal Zones   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails)  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Floodplains and/or Wetlands   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| B. <u>Regulated Substances/Activities: Would the proposed action involve any of the following regulated Items or activities?</u>                              |                          |                                     |
| 13. Natural Resource Damage Assessments   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. Invasive Species or Exotic Organisms  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. Noxious Weeds   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. Clearing or Excavation greater than one acre or Removal of Trees Governed by Local Requirement  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. Dredge or Fill (under Clean Water Act, Section 404, greater than one acre)  | <input type="checkbox"/> | <input checked="" 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 checked="" type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20. Polychlorinated biphenyls (PCBs)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22. Chemical Storage/Use	<input checked="" type="checkbox"/>	<input type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25. Liquid Effluents	<input checked="" type="checkbox"/>	<input type="checkbox"/>
26. Spill Prevention/Surface Water Protection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
27. Underground Injection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Hazardous Waste	<input checked="" type="checkbox"/>	<input type="checkbox"/>
29. Underground Storage Tanks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Radioactive or Radioactive Mixed Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31. Radiation Exposure	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32. Nanoscale Materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Genetically Engineered Microorganisms/Plants or Synthetic Biology	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Greenhouse Gas Generation/Sustainability	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Off-Road Vehicles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. Research on Human Subjects or other Vertebrate Animals	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39. Facility footprint exceeds 5,000 Square Feet	<input type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>
41. Existing, Modified, or New Federal/State Permits	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42. Involvement of Another Federal Agency (e.g. license/permit, funding, approval)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43. Action in a State with NEPA-type law	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44. Expansion of Public Utilities/Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45. Depletion of a Non-Renewable Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46. Subject to an Existing Institutional Work Planning and Control Process	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47. Other Pertinent Information Which Could Impact Human Health or the Environment	<input type="checkbox"/>	<input checked="" 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): Tommie L. Royster, Chief Executive Officer

Signature: *Tommie L. Royster* Date: June 28th, 2019  
 e-mail: troyster@r-displayandlighting.com Phone: 585-781-4327

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: On file in ACR Policy

Name and Title: Michael Passo Contract Specialist

Signature: Michael Passo Date: 7/8/19

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: Peter R. Siebach, NCO

Signature: Peter Siebach Date: 7/9/2019

C. DOE Counsel (if requested):

Name and Title: NA

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: Peter Siebach Date: 7/9/2019

Optional Additional Narrative: (add additional detail to description to Sections I and II or explanations to responses in Sections III and IV.

Project Description Continuation:

Research laboratory facilities located at Eastman Business Park, Rochester, NY will be used as the principle resource to execute work for the project. This will include synthesis and isolation of advanced blue phosphorescent emitters designed for high efficiency and superior stability for device operations. The RDL team is highly experienced in carrying out synthetic operations for organometallic compounds having successfully synthesized similar materials. The emitter materials will be screened and evaluated for OLED device and/or OLED SSL panel operation. The device fabrication and testing operations will be carried out through OLED panel manufacturing vendor OLEDWorks, Rochester, NY. High performing emitter materials demonstrating high light producing efficiency and good device operational stability will be sampled to OLED panel manufacturing companies for commercial application.

Explanation for III B:

7) Proper chemical handling procedures are required and will be implemented to avoid skin exposure to chemicals (chemical protective gloves will be worn) and the inhalation of organic fumes (all chemical operations will be conducted in a chemical fume hood to avoid inhalation of fumes).

Explanation for IV B:

22) All chemicals are properly stored in ventilated hoods or cabinet.

25) All liquid effluents are properly discharged within Eastman Kodak Business Park to an industrial waste treat plant permitted by New York State

26) HAZMAT resources are on site to handle any chemical spill

28) Any small volume or research level hazardous waste is properly discharged within Eastman Kodak Business Park to an industrial waste treat plant permitted by New York State