SFI Public Service Fellowship 2023

1. **Name of Governmental Department or Agency**
Environmental Protection Agency
2. **Title of the Project**
EPA2 Development of Atmospheric Dispersion Models to assist in the response to a nuclear or radiological emergency
3. **Description of the Project**
The EPA has been identified as a national principal support agency in the event of a nuclear or radiological emergency that may impact Ireland and has a role in providing technical support and advice to the National Emergency Co-ordination Group in such an event. To this end, the EPA use several medium and long-range atmospheric dispersion models to determine the evolution of a release of radioactive material into the atmosphere from nuclear accidents abroad. Outputs from the dispersion models, such as radioactive deposition on the ground, air concentration and time of arrival, are used to estimate the potential radiological implications for Ireland (predicted radiation exposure to the public and impact on the environment) and to propose the implementation of appropriate protective actions such as sheltering and bringing livestock indoors. The project aims to review and update the inputs (including weather, source terms and agricultural data) to the EPA's atmospheric dispersion models and to assess potential radiological impacts for Ireland, taking into consideration the development of new nuclear facilities in Europe, the longer-term operation of existing nuclear facilities and the nuclear safety implications as a result of the war in Ukraine.
4. **Project Scope**
• The first stage of the project would be to develop appropriate source terms for the nuclear scenarios under consideration and to update supplementary data required by the models to improve confidence in their outputs. • Appropriate worst-case weather scenarios for the nuclear emergencies of interest should be identified using archive numerical weather prediction data. • The models should be run using the worst-case weather scenarios for the nuclear emergencies of interest and their outputs assessed for potential radiological implications for Ireland.
5. **Skills/Expertise Required**
• Experience in atmospheric dispersion modelling would be preferable, but not essential, as training will be provided. • Good organisational skills to manage the large amount of data required for the model inputs and the outputs generated by the models.

- A working knowledge of GIS applications would be beneficial.

6. Expected Outputs of Project

- Updated source terms for the nuclear emergencies under consideration for use in atmospheric dispersion models.
- Identification of appropriate worst-case weather scenarios.
- An assessment of the radiological implications for Ireland.
- Enhanced confidence in the performance of the EPA's atmospheric dispersion models.
- A final report documenting the outcomes of the research.
- Publication of outcomes in scientific journals and relevant conferences or symposia.

7. Working Arrangements

The EPA Nuclear Safety and Emergency Preparedness Section is located in EPA Offices in Dublin and the Fellow would be based here. Blended working arrangements can be accommodated.

8. Expected Timeline

12 months full-time or 24 months part-time

9. Contact Details

Dr Kevin Kelleher, Senior Scientific Officer, Nuclear Safety and Emergency Preparedness Section, Environmental Protection Agency