**Natural Environment Research Council**

**Facility for Environmental Nanoparticle Analysis and Characterisation (FENAC)**

Application Form

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| For FENAC Use Only | |
| Date received |  |
| Application no. | FENAC/ |
| Decision |  |
| FENAC Grade |  |

**FENAC School of Geography, Earth and**

**Environmental Sciences**

**University of Birmingham**

**EDGBASTON**

**Birmingham**

**B15 2TT**

**Contact e-mails at FENAC are given at** [**www.birmingham.ac.uk/facilities/fenac/contact/index.aspx**](http://www.birmingham.ac.uk/facilities/fenac/contact/index.aspx)

**1. Principal investigator (grant holder if applicable)**

*Please note that the PI must be eligible to receive a NERC grant*

|  |  |
| --- | --- |
| **Name** |  |
| **Position** |  |
| **Address** |  |
| **Tel** |  |
| **e-mail** |  |

**2. Nature of proposal**

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| --- |
| **[ ]** New Proposal |
| **[ ]** Resubmission |
| **[ ]** Pilot Application |

**3. Project title and abstract (100 words maximum)**

|  |
| --- |
| **Title:** |
| **Abstract:** |

**4. Personnel**

*Please provide details of other investigators (co-investigators, postdoctoral fellows, research students or research assistants).*

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| **Name/e-mail** | **Position** | **Institution** | **Role in Project** | **Funding type / NERC Ref. No.**  **Training Grant Ref. No. Je-S PIN (PhD)** | **Attending Facility (Yes/No)** |
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| **Please provide details of prior use of FENAC. Attach copies of publications generated from previous use** |
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| **PhD Studentship.** *If this application forms part of a PhD student's project, the student must complete and the sign the following section. Please explain the importance of this application to the main objectives of the thesis (100 words maximum).* | |
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| **PhD Title:** | **PhD Start Date:** |
| **Student Signature:** | **Signature Date:** |

**5. Project**

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| **Outline of the Project.** *The description of the project should be a self-contained justification showing that the proposed characterisation work will make a significant contribution to the larger project aims. A* ***clear*** *description of the larger project and the* ***detailed*** *requirements of the work required from FENAC must therefore be included. This outline should include a detailed description of samples and required analysis. Please keep to a maximum of two (*2*) pages using a minimum 10 point Arial font and single line spacing.* |
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**6. Indicative analytical requirements**

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| **Nanoparticle Imaging and Sizing Techniques** | | | | | |
| **Technique** | **X if to be used** | **Description of information required from analysis** | **Number of samples** | **Description of samples to be analysed** | **Special sample storage/preparation requirements** |
| **SEM** |  |  |  |  |  |
| **ESEM** |  |  |  |  |  |
| **TEM** |  |  |  |  |  |
| **STEM** |  |  |  |  |  |
| **EDS** |  |  |  |  |  |
| **EELS** |  |  |  |  |  |
| **AFM** |  |  |  |  |  |
| **SNOM** |  |  |  |  |  |
| **CLSM** |  |  |  |  |  |
| **DLS** |  |  |  |  |  |
| **Zeta potential** |  |  |  |  |  |
| **FCS** |  |  |  |  |  |
| **Nanosight NTA** |  |  |  |  |  |
| **DCS** |  |  |  |  |  |

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| **Separation Techniques** | | | | | |
| **Technique** | **X if to be used** | **Description of information required from analysis** | **Number of samples** | **Description of samples to be analysed** | **Special sample storage/preparation requirements** |
| **FlFFF UV detection** |  |  |  |  |  |
| **FlFFF Fluorescence detection** |  |  |  |  |  |
| **FlFFF MALLS detection** |  |  |  |  |  |
| **CFUF, ultrafiltration** |  |  |  |  |  |
| **Dialysis** |  |  |  |  |  |
| **Gel electrophoresis** |  |  |  |  |  |

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| **Other Characterisation Techniques** | | | | | |
| **Technique** | **X if to be used** | **Description of information required from analysis** | **Number of samples** | **Description of samples to be analysed** | **Special sample storage/preparation requirements** |
| **GFAAS** |  |  |  |  |  |
| **ICP-OES** |  |  |  |  |  |
| **ICP-MS** |  |  |  |  |  |
| **SP ICP-MS** |  |  |  |  |  |
| **XPS** |  |  |  |  |  |
| **XRD** |  |  |  |  |  |
| **Technique** | **X if to be used** | **Description of information required from analysis** | **Number of samples** | **Description of samples to be analysed** | **Special sample storage/preparation requirements** |
| **BET** |  |  |  |  |  |
| **Contact angle measurements** |  |  |  |  |  |
| **Ellipsometer** |  |  |  |  |  |
| **Luminescence spectrometry** |  |  |  |  |  |
| **Surface plasmon resonance** |  |  |  |  |  |

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| **Other Characterisation Techniques: Small-Angle Neutron Scattering** | | | | | |
| **Technique** | **X if to be used** | **Description of information required from analysis** | **Number of samples** | **Description of samples to be analysed (inc. approximate hydrogen content of whole sample)** | **Special sample storage requirements (inc. estimated useable lifetime)** |
| **SANS\*** |  |  |  |  |  |
| **Brief outline of the rationale for the measurements and the information it is hoped to obtain:** | | | | | |

\**Samples may be solids (ca. 15 mm diameter x 1 mm thick), powders or aqueous/non-aqueous dispersions (ca. 500-1000 μl).*

*Measurements are made in association with STFC ISIS facility subject to* ***ISIS*** *operational schedules (ca. 100-180 days/year) and are therefore not ‘on demand’. Average turnaround is ca. 6 weeks.*

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| **Name of person who will carry out characterisation:** | **Is training required? (Yes/No):** |
| **Date when results are required:** | **Earliest date could start:** |
| **If timing is critical please explain why:** | |

**7. Development work**

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| **Nanoparticle synthesis** | | |
| **Type of particles** | **Particle characteristics** | **Additional information** |
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| **Method development** | | |
| **Technique required** | **Conditions** | **Additional information** |
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**8. NERC themes**

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| **Research Areas.** *Please indicate where you consider your project maps across NERC's seven Research Areas. For a full description of the themes see NERC's web site at www.nerc.ac.uk* | | | | | | |
| Science-based Archaeology | Earth Science | Marine Science | Atmospheric Science | Terrestrial and Freshwater Science | Earth Observation | Polar Science |
| **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** |

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| **Science Themes.** *Please indicate where you consider your project maps across NERC's seven Science Themes. For a full description of the themes see NERC's web site at www.nerc.ac.uk* | | | | | | |
| Climate Systems | Biodiversity | Earth System Science | Sustainable Use of Natural Resources | Natural Hazards | Environmental Pollution and Human Health | Technologies |
| **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** | **[ ]** |

**9. Funding**

*Source(s) of funding for the project e.g. university funds, NERC grant, government department, University or other (if NERC supported please give details, including sum, period and reference number)*

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| --- | --- | --- | --- |
| **Is the work NERC funded?**  **Y/N** | **Funding Body (e.g. NERC)** | **Title and Reference Number (if applicable)** | **Duration of Award (if applicable)** |
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**10. Authorisation**

*I have the best of my knowledge completed this application form as fully as possible and have read the NOTES TO APPLICANTS and agree to the conditions stated therein.*

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| **Principal Investigator** | |
| **Signature** | **Date** |

*I hereby confirm that the above Principal Investigator is eligible to hold an NERC research grant*

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| **Head of School / Division** | |
| **Signature** | **Date** |

**NOTES FOR APPLICANTS**

**Terms and Conditions of Access and Use**

1. Only the pages of this form will be forwarded to the Committee to peer review: any important appended numerical and/or graphical data and/or text will be held for reference by the Facility.
2. Principal Investigators are required to provide the Facility with: (i) the completed request form before commencing the work and (ii) the Committee with a brief final report (submitted through the Facility) within six months after completion of the analytical programme. The request form should provide all information that may be required by the Facility so that the analytical programme can be conducted in an efficient and appropriate manner. The final report should summarise the experimental results and provide a brief interpretation within a context of the original goals of the project.
3. If the investigator fails to provide reports requested as described in b) the following sanctions will be implemented: (i) no further applications to the FENAC will be accepted and (ii) the failure to provide a report will be logged with NERC.
4. It is the policy of FENAC to train researchers in the use of Facility equipment. Whenever possible a person named in SECTION 4 should be prepared to undertake such training and participate in the sample analysis.
5. The best use of the Facility is achieved if it has a collaborative role in the project, and it is normally assumed that the work will include some collaboration with Facility staff.
6. If the results of collaborative work are not prepared for joint publication within 24 months of completion of the analytical programme, then the Facility has the right to proceed independently with publication.
7. The Facility should be acknowledged (and informed) in all reports and publications that include data obtained at the Facility. FENAC staff should be co-authors in publications where appropriate. Completed drafts of all publications arising form work at the Facility must be provided to FENAC for comments before submission, to allow any necessary input to be made and to ensure that the results obtained at the Facility are reported accurately and correctly.
8. Submission in electronic format is mandatory + a printed copy.
9. Council accepts no responsibility or liability for materials submitted for analysis.

**List of code needed for completion of the application form**

**4. Personnel**

Funding type refers to type of NERC funding scheme under which FENAC research is performed. The NERC reference number should be included. If not related to a NERC funded project, put n/a.

For PhD students include information on type of funding scheme from NERC e.g. tied to a research project, CASE etc. The training grant reference number or Je-S PIN should be included.

**6. Indicative Analytical Requirements**

Selection of particular analytical technique is indicative rather than definitive. Final decisions on required analysis will be made on project commencement after consultation with FENAC staff.

**SEM** Scanning Electron Microscopy

**ESEM** Environmental Scanning Electron Microscopy

**TEM** Transmission Electron Microscopy

**STEM** Scanning Transmission Electron Microscopy

**EDS** Energy-dispersive X-ray Spectroscopy

**EELS** Electron Energy Loss Spectroscopy

**AFM** Atomic Force Microscopy

**SNOM** Scanning Near-Field Optical Microscopy

**CLSM** Confocal Laser Scanning Microscopy

**DLS** Dynamic Light Scattering

**FCS** Fluorescence Correlation Spectroscopy

**NTA** Nanoparticle Tracking Analysis

**DCS** Disc centrifuge

**FlFFF** Flow Field-Flow Fractionator

**RI** Refractive Index

**MALLS** Multi Angle Laser Light Scattering

**CFUF** Cross Flow Ultrafiltration

**GFAAS** Graphite Furnace Atomic Absorption Spectrometry

**ICP-OES** Inductively Coupled Plasma Optical Emission Spectrometry

**ICP-MS** Inductively Coupled Plasma Mass Spectroscopy

**SP ICP-MS** Single Particle Inductively Coupled Plasma Mass Spectroscopy

**XPS** X-ray Photoelectron Spectroscopy

**XRD** X-ray Diffraction

**SANS** Small-Angle Neutron Scattering

**BET** Brunauer, Emmett, and Teller method for surface area analysis

**CCD** Charged Coupled Device