

University of Glasgow
Gregory Building,
Lilybank Gardens,
Glasgow, United Kingdom, G12 8RZ

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UST202107-197/S.S.
09.05.01

Subject: Permit to research volcanic processes at Hrafninnusker, Hrafninnuhraun and Ljótípollur

The Environment Agency of Iceland has received an application from Velveth Perez and Dr. Dave McGarvie on behalf of the University of Glasgow, dated 20th of July 2021, for a research permit within Fjallabak nature reserve.

Fjallabak is protected as a nature reserve, cf. regulation no. 354/1979. Construction work, extraction of minerals, disturbance to geological formations, vegetation and wild animal life in the protected area is prohibited. Except with a permit from the Environment Agency of Iceland. According to the management plan rule no. 1, cf. regulation 422/2021, going off-path in area 1 is strictly prohibited without the prior permission of the Environment Agency of Iceland. According to rule no. 11, camping outside of designated campsites is only allowed by consultation with rangers in the nature reserve.

Description of the project:

The PhD project conducted by Velveth Perez, aims to use geographic, geological and numerical modelling research methods to better understand how subsurface magma movements can influence volcanic eruptions. Research indicates that on multiple occasions in the past, magma moving laterally in the crust from adjacent volcanoes has not only intruded Torfajökull and triggered eruptions there, but has breached the surface to form chains of eruption centres – and crucially, from a hazards perspective, many of these have produced very violent and explosive eruptions when magma has interacted with river water. These have not been studied, and so the reasons for their atypical violence are not understood. An important component of this PhD project is to evaluate the unusually large number of hazards from such eruptions in the Torfajökull volcanic area, and to use the results to construct a volcanic mitigation strategy.

Samples will be extracted from loose blocks already on surface (preferable) or via minimal use of geological hammers and chisels, with care taken to minimise damage. Tephra samples to be extracted by digging with a spade and carefully covering the disturbed surface. Samples will be taken from well exposed surfaces to avoid disturbance of flora. The research does not involve animal subjects and fauna will not be disturbed by participants. There will be no use of chemicals or chemical compounds.

Basaltic and basaltic/rhyolitic enclaves will be sampled from Torfajökull volcanic area. These need to be larger blocks for XCT scanning. Estimated block size required 10-20 x 20 x 20 cm; estimated total weight 10-20 kg, number of samples 6-7. Rhyolitic tephra (bomb-size) from Hrafninnuhraun. Estimated weight: 10 kg. Basaltic tephra from Ljótípollur. Estimated weight: 10 kg. Total sample weight to export between 30 kg and 40 kg.

Impact assessment:

Based on the information from the applicant the Environment Agency of Iceland does not consider the research likely to have impact on the conservation values of the area.

Conclusions and conditions:

The Environment Agency of Iceland hereby grants the University of Glasgow, permission on its behalf to research volcanic processes at Hrafninnusker, Hrafninnuhraun and Ljótípollur within the Fjallabak natural reserve as described above on July 24. - August 12. 2021 on the following conditions:

- Keep this letter with you on site during the project. The permit conditions should be introduced to the staff of the project before work begins.
- The applicant shall inform rangers in the area about their arrival and departure. This is to be done 24 hours before entering the area and again before leaving it.
- If the project dates or description changes the Environment Agency shall be notified as soon as possible.
- Crew members should always stay on authorized paths/tracks/roads.
- When it is necessary to go off-path, extra care must be taken not to cause damage to terrain, including vegetation, soil and geological formation. All traces of activity must be removed afterwards.
- The crew must follow rules of conduct that apply to the area.
- This permit is only valid for research purposes. It does not include permit to utilize the samples for commercial purposes. The samples cannot be signed over to third party for commercial use.
- Every measure should be taken to avoid damage to the sites and unnecessary disturbance while collecting samples.
- Samples should be collected where any resulting disturbance to soil, vegetation or geological formations is not visible to other visitors and out of the line of sight of nearby paths and roads.
- All vehicles used during field exploration must be labelled with the identity of the researcher's institute. All participants in the project must wear high-visibility clothing during field work, labelled with the identity of the researcher or the research institute.
- The project's staff is required to wear marked clothing with the identity of the researcher's institute and inform other guests in the area of the projects purpose and that a research permit has been obtained from the Environment Agency of Iceland.
- All disturbance to animals and wildlife is strictly prohibited.
- Off-road driving in Iceland is strictly prohibited.
- The project's staff is required to prevent all disturbance to the environment and make sure that all litter is removed from the sites.
- If travel toilets are used within the sites, to disposal of the contents should done in authorized discharge site outside the protected area.

If the researcher causes damage to nature, then according to art. 87 in the Nature Conservation Act no. 60/2013, the Environment Agency of Iceland can, according to the Nature Conservation Act, f.e. order the licensee to fix damage to nature and vegetation and/or stop the project.

The Environment Agency of Iceland can according to art. 89 in the Nature Conservation Act no. 60/2013 change conditions of the permit, add new conditions or withdraw the permit in order to prevent damage to nature if environmental conditions change.

According to art 89. in the Nature Conservation Act no. 60/2013, the Environment Agency can withdraw the permit if conditions of the permit are not complied to.

If you wish to export samples from Iceland a special permit is needed from the Icelandic Institute of Natural History (www.ni.is).

The Environment Agency of Iceland wishes to receive, free of charge, a copy of all reports and scientific articles that result from the research project.

The decision may be appealed to the Ministry for the Environment and Natural Resources according to art. 26 of Act no. 37/1993 on Administrative Procedures, based on Art. 91 of Act no. 60/2013 on Nature Conservation within three months from the date of this letter.

Supervision:

The Environment Agency will supervise the project. The supervisor will be a ranger from the Environment Agency.

Sincerely

Hákon Ásgeirsson
advisor

Sigríður Skaftadóttir
lawyer