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6. júní 2019  
UST201905-156/P.V.B.

**Subject: Research permit**

The Environment Agency of Iceland has received an application from Lindsay McHenry at the University of Wisconsin - Milwaukee, dated May 15<sup>th</sup> 2019, for research permit within Geysir area and Grensdalur

Geysir is listed on the Nature Conservation register and is under the Environment Agency supervision.

Grensdalur is not a protected area and therefore the Environment Agency of Iceland does not issue permits for research in the area. Permission from the landowner is needed for the sampling there.

***Description of the project:***

The aim of the research is to study the effects of water chemistry on the hydrothermal alteration of basaltic lavas and hyaloclastites in southern Iceland as an analog for water/rock interactions on early Mars. The plan is to sample water, rock and hydrothermal precipitates from hot springs and fumaroles across a range of pH, temperature and oxidation potentials, analyze them mineralogically and geochemically and compare the results to relevant Mars deposits. A small trowel will be used to excavate shallow, narrow pits (no deeper than 50 cm) in active hydrothermal/fumarole areas to collect samples from shallow depth. These will be carefully backfilled. For precipitated materials (e.g. silica sinters and travertine) sampling will be limited to previously broken pieces, out of view from major tourist trails. At Geysir water and sinter samples will be collected from the outwash streams (downstream from the major hydrothermal features). 4 water samples and 4 sinter samples (from previously broken pieces) will be collected. One shallow, narrow pit will be excavated in the older, hydrothermally altered soils to the northwest of Geysir, collecting 4 samples at different depths. One sample of less altered hyaloclastite will be collected from the ridge to the northwest of the hydrothermal area. The research will take place in the period of August 17<sup>th</sup> -25<sup>th</sup> 2019. Four persons will conduct the research.

***Impact assessment:***

The Environment Agency considers the project not likely to have long term negative impact on the area if conditions of the permit are followed. For the short term the research might have

negative impact on other visitors in the area. By collecting the samples early in the morning or late in the evening when visitors are not in the area the impact is limited.

***Conclusions and conditions:***

The Environment Agency of Iceland hereby grants Lindsay McHenry from the University of Wisconsin - Milwaukee a permission on its behalf for the research as described above during the period of August 17<sup>th</sup> -25<sup>th</sup> 2019 on following conditions:

- Keep this letter with you on site during the project.
- If the dates of the project change the Environment Agency shall be notified as soon as possible.
- The applicant shall inform rangers in the area at least 24 hours before the research starts or when he will arrive in the area.
- The Environment Agency should be informed if there will be any changes to the project description.
- It is not allowed to walk on the silica sinter or other fragile areas.
- Sampling location should be chosen in collaboration with rangers in 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 the samples.
- Samples should be collected where the laceration is not noticeable.
- It is only allowed to sample previously broken material, not to break new samples from the silica.
- Damage to the site is prohibited while collecting the samples.
- This permit is only valid for sample collection according to the application.
- All participants in the project must wear high-visibility clothing during field work, labelled with the identity of the researcher or the research institute.
- Geological formations and landscape should not be disturbed.
- The permit conditions should be introduced to the staff before the work begins.
- Off-road driving in Iceland is strictly prohibited.
- All disturbance to animals and wildlife is strictly prohibited.
- The crew should be conscious of other guests on the sites and make sure that the research causes as little disturbance as possible to other visitors. During early morning and late afternoon, there are less people visiting the sites.
- If any complications occur during the project, please contact the ranger or the Environment Agency of Iceland, tel. +354 591 2000.

If the applicant causes damage to the nature, 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. ordered the licensee to fix damage to the 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.

A permission from the landowners and/or the municipality might be needed for the project.

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

Permit from the National Energy Authority is needed for researches in geothermal areas ([www.os.is](http://www.os.is)).

***Request:***

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

***Permission fee:***

Environment Agency of Iceland charges a fee for processing applications for permits in protected areas based on Article 92 of Act no. 61/2013 on Nature Conservation. The fee for researches is 39.400 ISK according to art. 24. b. in the agency's tariff no. 535/2015.

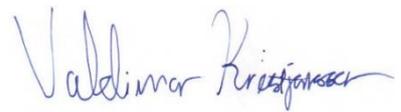
***Supervision:***

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

Sincerely



Hildur Vésteinsdóttir  
Team leader



Valdimar Kristjánsson  
Advisor