

Research projects in and around the water protection areas of Veitur Utilities and ON Power

Continuous efforts are made to enhance the knowledge of groundwater flows in the water protection areas of Veitur Utilities and ON Power. Research is conducted to better underpin decisions regarding land use and water extraction, as well as to the quality of drinking water for the future.

Water protection for the Capital Area

- Continued operation of a dense network of water level meters in monitoring wells in the vicinity of the capital area. These meters are used to monitor the effects of water extraction on the water table in the area.
- Annual update of the engineering firm Vatnaskil's groundwater model of the capital area.
- The engineering firm Vatnaskil is conducting an assessment of the potential pollution risk to nearby water sources due to the development of an industrial area in Holmsheidi. This work is being carried out in collaboration with the City of Reykjavik.
- Iceland GeoSurvey (ÍSOR) is reviewing the fracture coverage in Heidmörk based on LiDAR data.
- Fractures are being examined in the vicinity of major transmission pipelines. This research project is funded by Orkuveitan's Science Fund (VOR).
- Continued work on assessing the impact of increased water extraction from Vatnsendakrikar on the groundwater levels in the surrounding area, particularly in Kaldarbotnar. Veitur and Kopavogur Water Utility commissioned Vatnaskil to reassess key parameters in the groundwater model around Vatnsendakrikar to improve its ability to predict the effects of future extraction in the area.
- Ongoing real-time monitoring of the microbial community in water using flow cytometry for (i) control of drinking water quality and water sourcing, and (ii) research aimed at identifying potential improvements in vulnerable water extraction wells. Flow cytometers provide a simultaneous overview of the microbial quality of drinking water across separate water abstraction areas and wells. The equipment is used alongside other environmental measurements for real-time monitoring and management of water quality in Veitur's lower water extraction area in Heidmörk, as well as for improved resource utilization.
- Ongoing continuous measurements of weather parameters and snow thickness, along with temperature, humidity, water content, and conductivity in the soil in Heiðmörk. The data is used for: i) Monitoring by operators to understand the relationship between weather, environmental factors, and microbial contamination, as well as to assess the need for response measures, ii) Tracking variability due to weather patterns and long-term climate change (long-term measurements to enhance understanding of climate change impacts), iii) Research purposes to better understand the relationship between environmental conditions, vegetation, and weather patterns in relation to water source quality.

- Regular flow measurements in Suðura and Holmsa rivers. Decades-long time series reflecting water balance and floods. The data provide a multi-decade perspective on the development of flood and thaw events in Heidmörk.
- Installation of flow meters at the Valla water source in Kjalarnes, with an assessment of its capacity and usage.
- Continued monitoring of water quality variability from wells near Myllulaekjartjörn pond, tracking the effectiveness of improved pumping controls.
- Ongoing real-time monitoring of turbidity, pH, conductivity, temperature, and fluoride levels in water from both the lower and upper water abstraction areas of Veitur in Heidmörk, including an assessment of the impact of volcanic eruptions on the Reykjanes Peninsula on water quality.
- Research work and a peer-reviewed ISI journal article on the effects of wildfires on water abstraction areas in the capital region ([Impact of wildfires on the drinking water catchment for the capital area of Iceland – a case study](#)).

Water protection in rural areas

- Water extraction wells at Seleyri near Borgarfjörður bridge were renewed in the summer of 2022 to ensure future water collection from the area. The design of the well activation along with the construction of a pumping station is currently underway.
- Exploring options for improving water quality in the water supply connected to the Grabrokarhraun lava field water source, due to an increase in fine particles following seismic activity on the Reykjanes Peninsula and heightened precipitation intensity. Assessing potential solutions, including enhanced water filtration and sourcing water from alternative locations.
- Real-time monitoring of microbial levels at Veitur's pumping station in Grábrókarhraun lava field using flow cytometry, utilized to assess the impact of earthquakes and precipitation events on water quality. At the end of the year, another device was installed at the Hamraendar pumping station on the outskirts of Stykkisholmur to monitor microbial quality following the detection of coliform bacteria in samples from untreated water distributed to Helgafellssveit, located above Stykkisholmur.
- Increased sampling and measurements at Veitur's water source in Berjadalsa river to monitor the effectiveness of improved operations following algal growth in the summer of 2023, which affected the taste quality of the water.

Water protection in the Hengill area

- Monitoring of water level measurements in monitoring wells in the Hengill area to better understand the effects of water extraction on groundwater level and groundwater flows.
- Annual update of the engineering firm Vatnaskil's groundwater model covering the Capital area and the Hengill extraction area.
- Chemical monitoring of groundwater in the vicinity of the power plants to monitor potential impacts of geothermal extraction on the groundwater resource.
- Sampling and measurements from springs and boreholes at Nesjavellir to monitor and increase understanding of variability in water temperature and water quality.