Supplying safe drinking water during geological episodes

Nordic-Baltic Drinking Water Conference
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HES

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Out and about during sampling of drinking water

On my way to work on February 8th 2024


Lunchbreak May 29th 2024

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- Overview
  - Risks to waterwork infrastructure
    - Structures above ground
    - Distribution systems
    - Electrical safety
    - Risk mitigation
  - Risks to food safety
    - Volcanic gasses
    - Earthquakes
    - Eruptions on water protection area
    - Volcanic gas and ash emission on water protetion area


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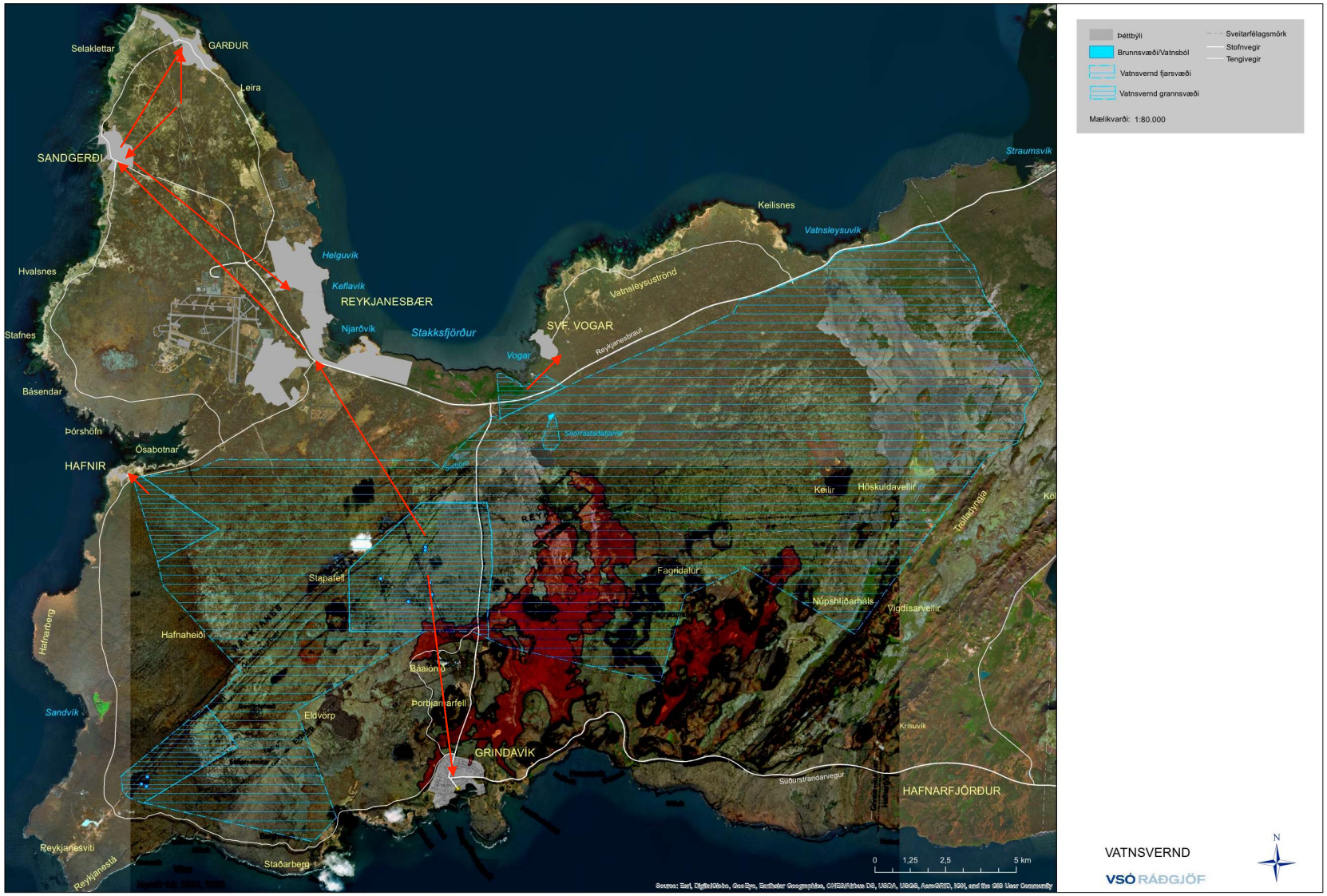
VESTFIORDVNG
Glama
NORDLEN DINGAFIORDVNG
SVNDLEN DINGAFIORDVNG
AVSTLENDIN GAFIORDVNG
Getlands Iokul
Arnafelds Iokul
Sand Iokul
Bald Iokul
Skialbred
Kluka
Hekla
Snceuels Iokul
Medalland
Porlarks haffn
AVEVOS



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Risks to waterwork infrastructure

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Structures above ground

- Damages by earthquakes
- Damages by lava flow
- Not accessible due to lava flow and / or gas pollution

Risks to waterwork infrastructure

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Distribution systems

- Underground pipes
  - Being run over by lava and overheating
    - Plastic pipes
- Damages by earthquakes
  - Elevated turbity

Risks to waterwork infrastructure

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Electrical safety

- Electricity being cut off from pumps in water wells
- UV treatment inactive
- Online - realtime monitoring inactive
- Communication cut off

Risks to waterwork infrastructure

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Risk mitigation

- Waterwork with 2 groundwater sources ~20 km apart
- Online real-time monitoring of pH, contuctivity, turbidity, F
- Diesel generator for electric emergency
- Portable remote control of water pumps

Risks to waterwork infrastructure

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Risk mitigation

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Risks to waterwork infrastructure

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Risks to food safety

- Volcanic gasses
  - SO_2 -> sulpuric acid => ↓pH
  - H_2S and CO_2 dissolve in groundwater
  - Increased solubility of trace minerals (Fe, Al, Ni, Cd, Pb, Hg)

Risks to waterwork infrastructure

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Earthquakes

- Water / electrical outage
- Damaged distribution system and leakages

Risks to waterwork infrastructure

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Eruptions on water protection area

- Ground water heats up and earth minerals are dissolved
- Ground water turns into geothermal liquid
    - Changes to drinking water composition can occur very slowly
- Volcanic gas and ash emission on water protetion area

Takk fyrir

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