



Reference sheet
Temporary remediation

Time of assignment

2019-2023

Client

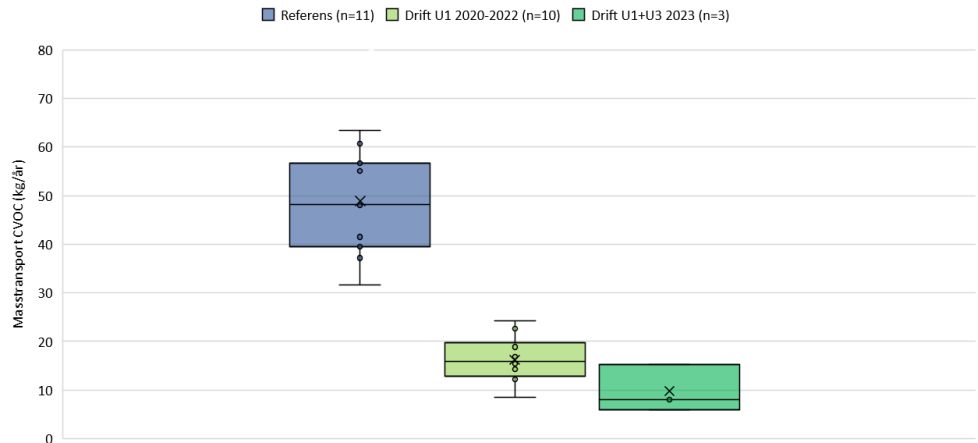
SGU

Contact person, NIRAS

Nicklas Larsson

Mail

nicklas.larsson@niras.se



Mass transport (kg/year) of chlorinated solvents in Örbäcken stream downstream from one of the discharge areas before (blue) and after (green) temporary partial remediation.

Temporary remediation to limit Contaminant transportation in groundwater

Involuntary releases of the dry-cleaning chemical perchloroethylene (PCE) during the period 1970-1993 have caused extensive soil and groundwater contamination at the former Hagforstvädden in Hagfors. Contaminated groundwater spread in the Geijersholm esker, and parts of the contamination flow into the nearby Örbäcken stream, which is annually burdened with just over 100 kg of PCE in two different discharge areas. The Geological Survey of Sweden (SGU) has commissioned NIRAS to design temporary partial remediation to reduce the transportation to the stream.

NIRAS has designed a remedial solution in one of the discharge areas, where two horizontal drainage pipes have been established at different depths perpendicular to the contaminated groundwater plume. The pipes have been installed through directional drilling, and each pipe is equipped with an internal suction hose with a hole configuration adapted to the spread of groundwater contamination. This allows contaminated groundwater to be captured along a stretch of approximately 40 meters with only one groundwater pump per pipe. The Pump & Treat facility was put into operation in 2020.

In the other discharge area, pilot tests have been conducted with a directly injected reactive barrier (ZVI), which showed that the method was not sufficiently effective at the current site. Therefore, four traditional pump wells have been established and connected to the Pump & Treat facility.

Operational experiences show that there are challenges, in the form of iron precipitations, that require some increased maintenance. The combined Pump & Treat solution in the two areas has reduced the contaminant transportation to the stream by 75%. The remediation has also resulted in the concentration of chlorinated solvents being below the environmental quality standard in the Örbäcken stream.