

# Groundwater and Soil Vapour Remediation at Nuremberg Airport



BAUERUmweltgruppe

<b>Client:</b>	Airport Nuremberg GmbH, Germany
<b>Engineering Design and Supervision:</b>	albuCon, Erlangen
<b>Scope of Work:</b>	Design, Construction and Operation of a Groundwater and Soil Vapour Remediation Plant
<b>Contract Period:</b>	2004 to 2007



## Project

In January 2004 FWS Filter- und Wassertechnik installed a combined groundwater and soil vapour remediation plant at the Nuremberg Airport area. The remediation concept is designed in three phases in dependence on the fade of contaminants over the time.

Process visualisation and an automatic alarm system allow the supervision of the plant.



The groundwater and soil vapour remediation plant is designed for three remediation phases in dependence on the fade of contaminants.

## Remediation Site

Before the installation of a modern propane-gas-beaconed fire simulation plant the fire-brigade at Nuremberg Airport used kerosene for the simulation of fires. Thus combustion residues and fire extinguishing agents penetrated into the underground and caused a groundwater contamination with BTEX, PAH and halogenated VOC's. The average throughput to the installed remediation plant amounted to 9 m<sup>3</sup>/h groundwater and 350 m<sup>3</sup>/h soil vapour.

## Result

Groundwater treatment is carried out in a precipitation/flocculation stage with a gravel filter stage downstream. The gravel filter stage is equipped with an automatic backwashing system. Heavy metals and parts of the organic contamination bounded to flocks and suspended matter are removed in this treatment stage. Thereafter the organic contaminants are removed by means of a compact stripping stage.

Soil vapour and off gas from the stripping stage are first treated by a catalytic oxidation. In a second phase the catalytic oxidation is replaced by vapour phase activated carbon. In the last remediation phase the stripping stage is removed completely. In this phase water treatment takes place by means of liquid phase activated carbon. Thus operation costs are minimised in dependence on the contaminant concentration. Furthermore the treatment plant is divided in five groundwater and five soil vapour treatment parts. On demand each part can be shut off individually.

By using an antifoaming agent frothing formation due to the tensides in the raw water can be avoided. The treated water is discharged via a drainage ditch into the receiving stream.



Due to the simulation of fires and fire drills by the fire-brigade at Nuremberg Airport combustion residues and fire extinguishing agents caused a groundwater contamination with BTEX, PAH and halogenated VOC's.