

Groundwater and Surface Water Treatment on the former Premises of the Karl Richtberg GmbH & Co. KG in Bergheinfeld



BAUERUmweltgruppe

Client: District Office Schweinfurt, Germany

Engineering Design and Supervision: Dr. Rietzler & Heidrich Engineering Consultants, Nuremberg

Scope of Works: Water Treatment of the Groundwater and Surface Water contaminated with Tar (PAH), BTEX and Total Petroleum Hydrocarbon (TPH)

Contract Period: February 2003 until 2007



Project

On a former industrial estate in Bergrheinfeld the BAUER Environment Group had already successfully executed the deconstruction of the buildings, soil excavation as well as replacement drillings. Altogether 47,400 m³ contaminated soil had been removed. Accompanying the deconstruction process a water treatment plant for the treatment of the resulting construction site water had been installed temporarily.

Following the building activities the installation and the operation of a plant for the long-term treatment of the contaminated groundwater was necessary. The flow rate of this water treatment plant amounts to 10 m³/h maximum.



The sand filters of the treatment plant are backwashed time controlled respectively pressure controlled. The back washed sludge is buffered in the sludge storage tank (right) until its disposal later on.

Remediation Site

Over a period of several decades railway sleepers had been produced and impregnated by the Karl Richtberg GmbH & Co. KG, which resulted in a severe contamination of the soil on the former working area in Bergrheinfeld. The contamination with tar (PAH), BTEX and TPH made a groundwater and a surface water treatment necessary.

Result

The treatment process is executed in four treatment stages. The colloidal matter is removed in a subsequent inclined tube settler by addition of iron(III) chloride, sodium hydrochloride solution and a flocculation agent. In this preliminary stage the water from the existing excavation pit and from the two rain retention basins is pre-treated.

In a 20 m³ large water basin both the pre-treated rain water and the groundwater from the nine groundwater pumps are collected. Due to this buffer volume a constant feeding of the plant is ensured. Moreover the basin contains a coalescence stage. Not dissolved tar components are removed in this stage by three-fold special fleece.

The filtration stage consists of two gravel filters switched parallel, which are filled with three layers of gravel of different grain size, and sand filters. In this stage solids, which have not yet been removed after flocculation, and the colloidal matter in the groundwater are removed from the water.

Adsorption of the pollutants takes place by an activated carbon stage. The liquid phase activated carbon used has a specific surface of 800 m²/g. Due to this large surface it is possible to adsorb 3 to 4 weight percent of organic pollutants. After exhaustion of the carbon a thermal regeneration is possible, thus the activated carbon can be reused.



The treatment plant consists of coalescence separator, inclined tube settler, storage water basins and a tent-covered filter section with two sand and two activated carbon filters. It is appropriate for the treatment of 10 m³/h.



Apart from the groundwater treatment an additional 4 m³/h of surface water and construction site water has to be treated. As retention and sedimentation basin for the water serves a storage basin with a capacity of 70 m³.