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Pilot Action: Novy Bydzov Functional Urban Area

Version 1
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1. Pilot Action FUA Novy Bydzov

The town of Novy Bydzov is located in Eastern Bohemia in the Hradec Kralove Region (The Czech Republic). Novy Bydzov is one of the smaller towns in the Czech Republic, with a population of about 7,200 people. It covers the area of 3,524 ha. The town was founded in 1305, originally as a royal town, and it was an important administrative centre of the Cidlina Region. Industry developed in the 19th and 20th century. Industrial plants, such as machinery plants, metal cutting plants, metal foundry plants, plants for chemical treatment of metals etc., were scattered within the town and a lot of them were situated in the vicinity of residential areas. State owned enterprises were privatised in the 90s of the last century. Some industrial plants were later abandoned or closed as a consequence of bankruptcy or economic inefficiency.

Figure 1 The aerial photo of the town centre

The improper handling of hazardous compounds (such as chlorinated hydrocarbons, mineral oils etc.) during the communist period caused uncontrolled contamination of Quaternary aquifer (Quaternary aquifer is shallow, about 4-5 meters thick, composed of sandy gravel with the hydraulic conductivity of 10-4 ms-21, delimited by an impermeable Mesozoic strata of 400 meters thickness). Although the majority of households in Novy Bydzov have access to drinking water distributed by the municipal water supplying system, private wells (quaternary aquifer) are also used by some households as a source of drinking water or for irrigation of gardens.

A serious health problem of a citizen living beside a ruined and closed KOVOPLAST Plant was discovered in 2007 as a consequence of drinking contaminated water from a private well. The level of groundwater contamination from chlorinated aliphatic hydrocarbons runs to thousands of micrograms per litre.

The City of Novy Bydzov - as the responsible authority for groundwater, drinking water and contaminated site management and as land owner - has started measures to protect the public health and has carried out groundwater investigation. The frame of the project FOKS implemented through the CENTRAL EUROPE Programme where the City

participated as an associated partner has enabled to continue the identification of these hot spots, to evaluate risks and to prepare mitigation measures. The City was awarded financial support from the EU Fund Operation Programme – Environment and initiated preliminary remediation measures for the site "KOVOPLAST".

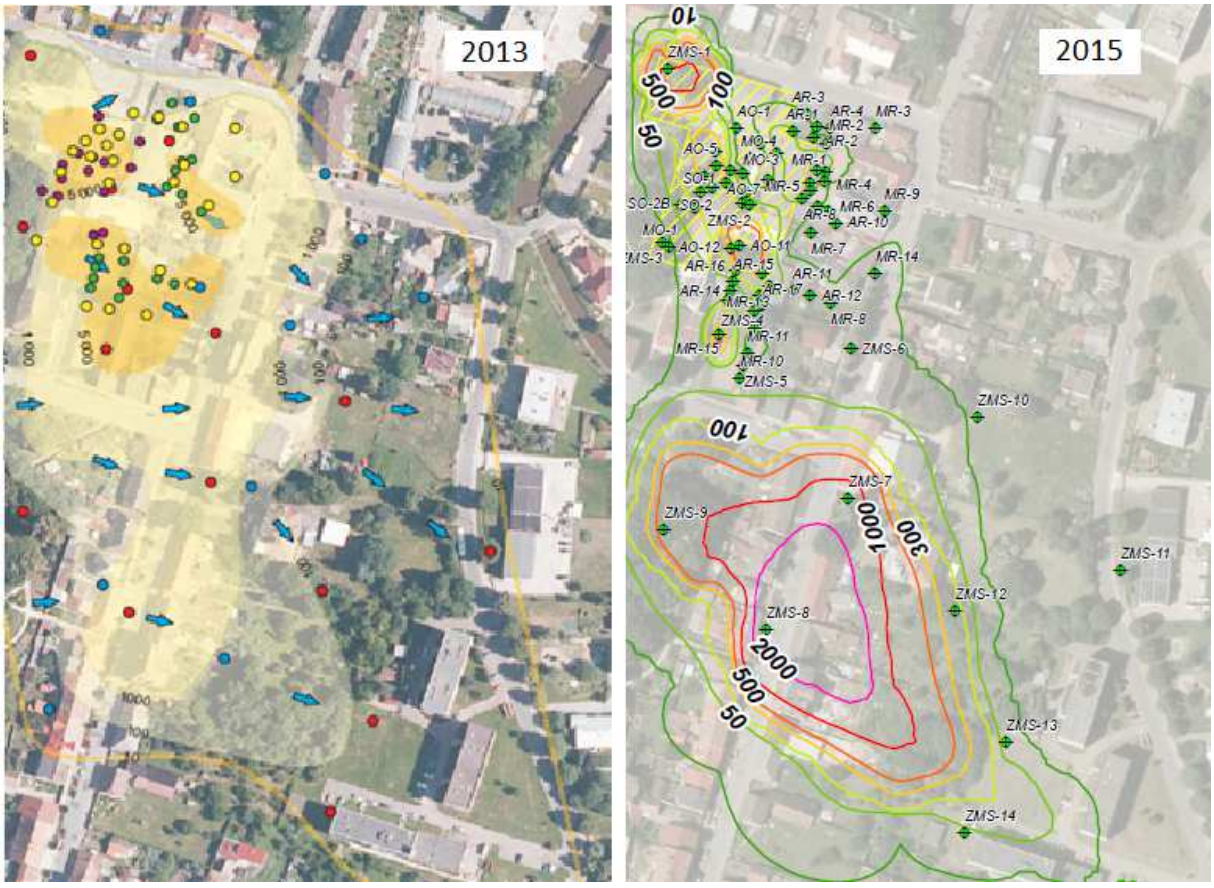

Figure 2 Tetrachlorethylene groundwater pollution – in 2013 and in 2015 (after initial remediation funded from Operational Programme Environment 2007-2013)

Environmental burns threaten public health, prevent residents from using groundwater for drinking and utility water, and complicat prepared investment projects in Novy Bydzov area. The City Nový Bydžov endeavours to continue in remedial measures and to improve the quality of life of residents.

The innovative remedial technology Biological Enhanced Reductive Dehalogenation (BRD) will be applied for decreasing the contents of chlorinated hydrocarbons in groundwater in the Pilot Action FUA Novy Bydzov. The Pilot Action will demonstrate the exemplary case study of processing the biologically enhanced remediation of groundwater polluted with chlorinated hydrocarbons in FUA Novy Bydzov.

Pilot Action in FUA Novy Bydzov will perform the key steps assuring the effective and sustainable remediation- testing remedial procedures in laboratory scale, then verifying in the field in pilot scale before the full scale application. The innovative tools BMT and CSIA developed in WPT1 will be tested and validated.

2. Activities planned in FUA Novy Bydzov

The following activities are planned in FUA Novy Bydzov:

- The set of temporal remedial application and remediation monitoring wells will be constructed for realization of biologically enhanced remediation, for monitoring of remedial progress and efficiency.
- The quality of groundwater in existing and new wells will be determined as the initial phase of planned remedial activities. The results will be used for the design of next steps - laboratory and field tests of remediation.
- The conditions of groundwater transport and pathways of pollution will be identified via the tracer tests with the aim to monitor the procedure of remediation and to control its efficiency.
- The design of planned remedial technique will be assessed in laboratory scale by the set of tests (column tests, BMT tests, analytical tests etc.). Tests will enable to specify the parameters of the remediation in the scale of field test. The report will evaluate the results and prepare the concept and design of field remediation.
- Remediation in the field scale will serve as a model example, how to manage and operate remedial interventions based on biological processes - natural attenuation and biologically enhanced attenuation in FUA´s.
- The developed tool - BMT will be applied and exploited during the whole Pilot Action period to precise the reliability of the tool and to enable the test of BMT in practical conditions. BMT will be applied in the initial phase to determine the potential of microbiological activity in aquifer, to decide which modification of biological remedial method will be appropriate as well as to evaluate the progress and efficiency of remedial action.