



# HOListic Management of Brownfield REgeneration (HOMBRE)



## **Solec Kujawski (Poland) – HOMBRE philosophy around local brownfield regeneration project**

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HOMBRE Final Conference, 14-16.10.2014, Frankfurt /Main





## HOMBRE case study in Poland

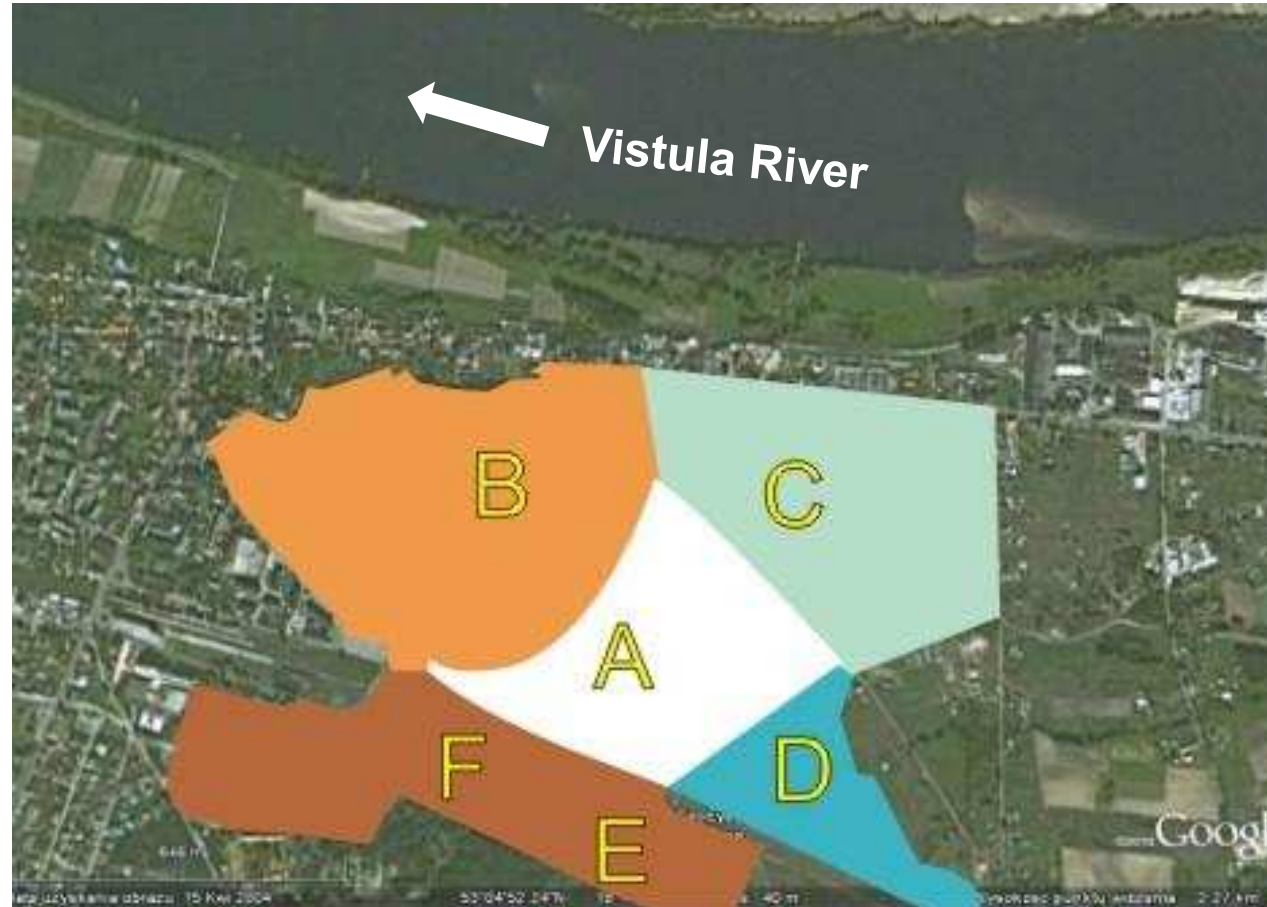


# HOMBRE





## HOMBRE case study in Poland





## Localisation





## The HOMBRE case

City forest with regional attraction – Jura Park. Many visitors and excursions per day. Open air museum, sport facilities, restaurants

Former wood preservation manufactory (1876 – 2001), demolished, abandoned area, heavy contaminated ground (sands) and groundwater (on depth of 4,5 m) - PAHs, BTEX, Phenols = creosote oil

Vistula F

Housing estate (blocks), school, shops, bars

Metal & car industry, heating plant and railway area. Production and storage area

Forest and small creek

Previous shoe manufactory. Former tannery with spill ponds, Cr, As, ammonia and xylenes contamination is possible





## Reasons for the use of Solec case for HOMBRE

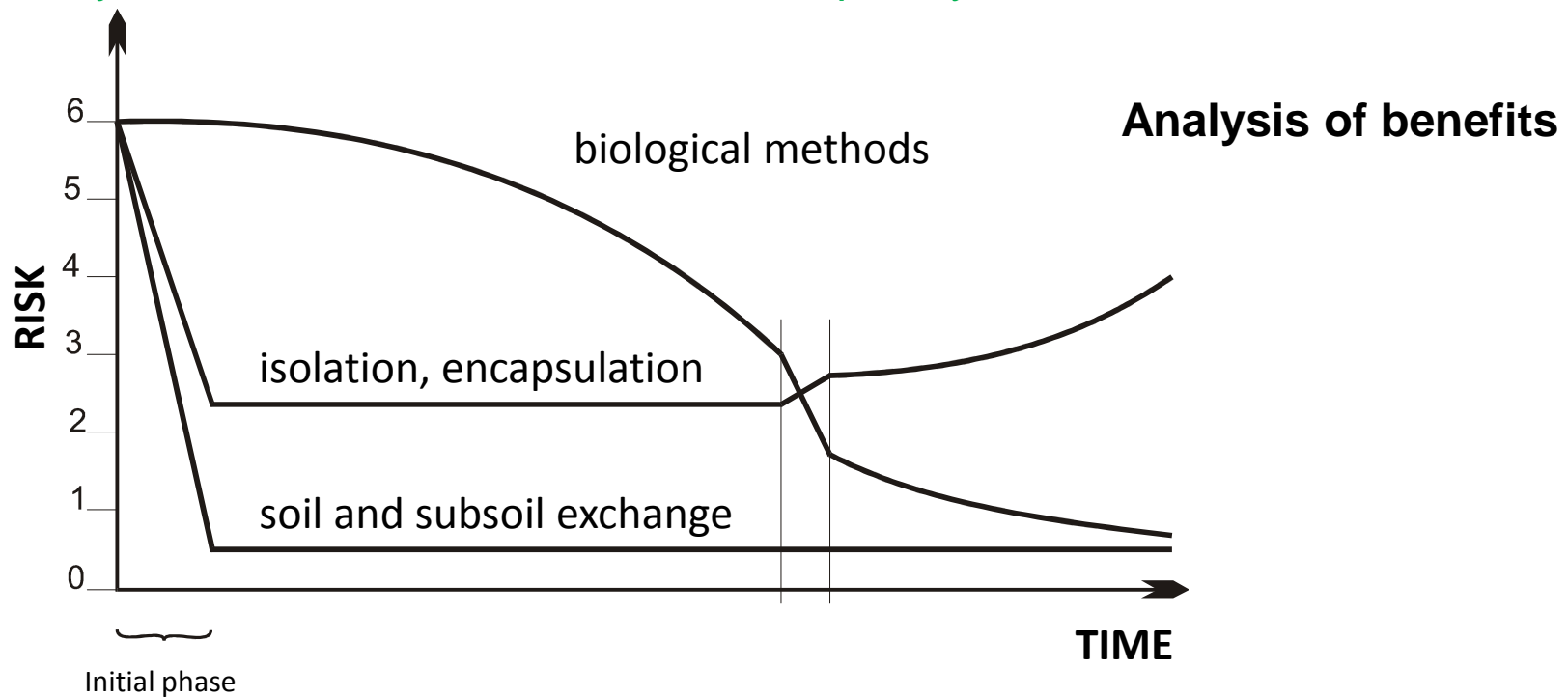
- ❑ huge contamination and a relatively large postindustrial area (16 ha): brownfield in a „hopeless state” in the Polish realities;
- ❑ an exceptional barrier for the development of the small town: 140 years of environmental pollution with creosote, additionally 25 years of passive and stagnant situation (the barrier should be overcome rather than left for the next generation);
  
- ❑ area finally in the hands of the public administration – opportunity for legal changes, the chance for getting funding;
- ❑ advanced research and the chance of the status changing, revitalisation of this area (because real vision of technical remediation);
- ❑ perfect example of the worst scenario for the abandoned area for understanding the process for zero brownfield perspective





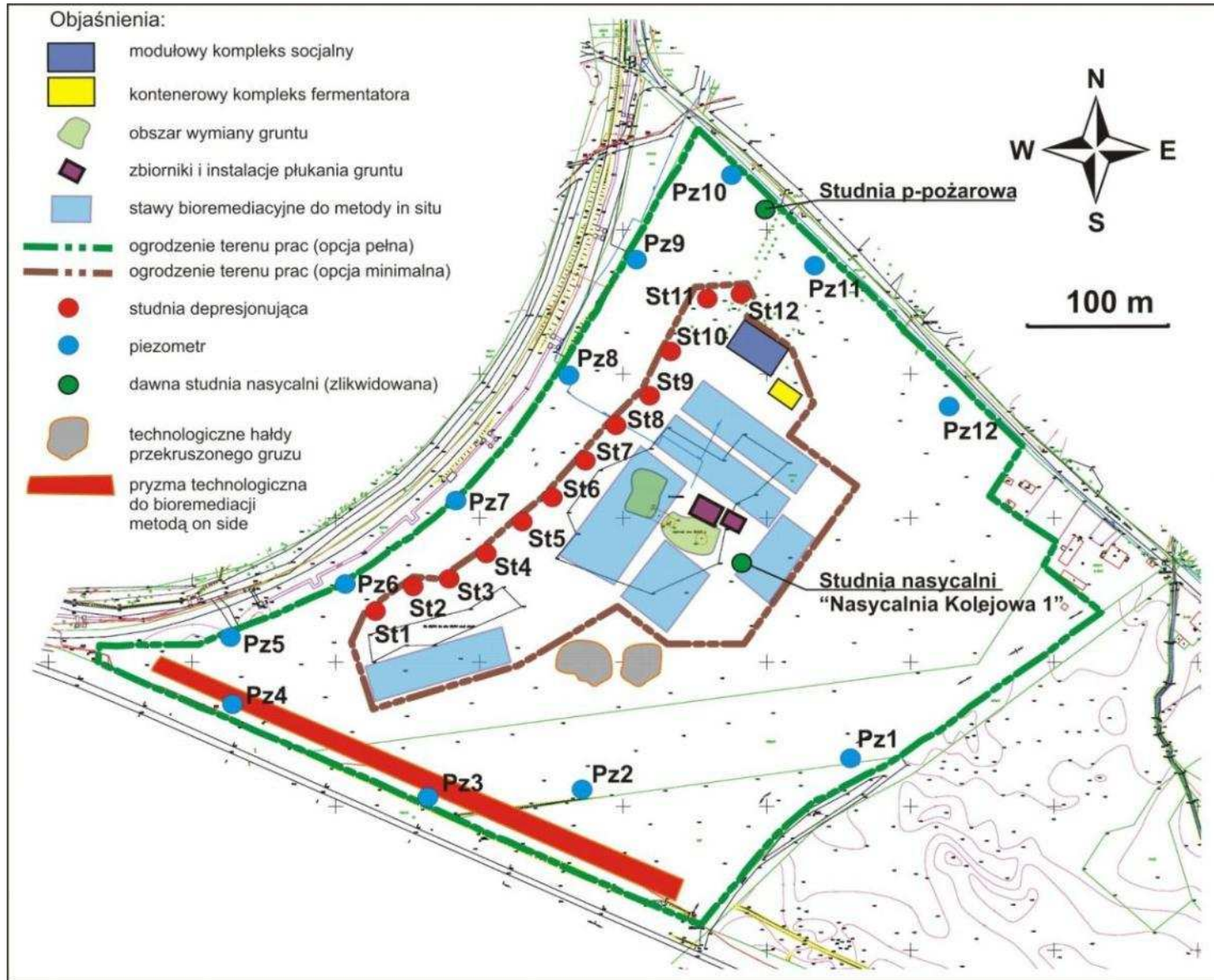
## A bit about the remediation project

- the results of past research,
- historical analyses of the wood sleepers production and of the terrain,
- the experiences gained from cooperation and from other similar cases in Poland and Germany,
- technological innovations,
- analysis of benefits and losses in subsequent years



Source: Altlasten Handbook, LfU Karlsruhe, 1989

## Conceptual remediation map





## Situation in 2011



Partly cut, half-full creosote container, was the most dangerous source of contamination.

Old basement used as big underground creosote container – for the emergency situation (e.g. fire)





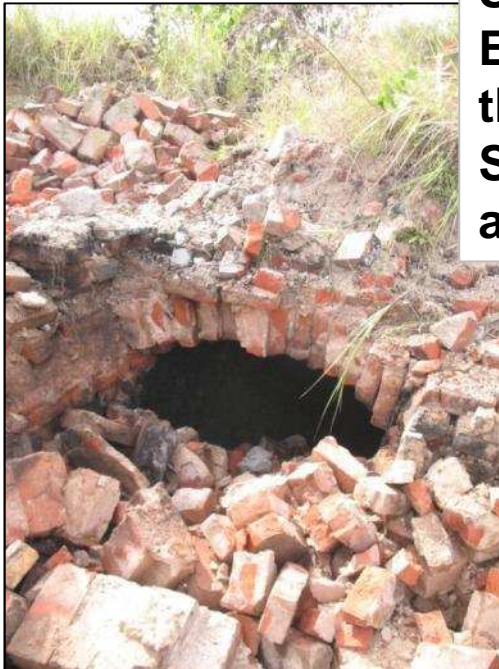
Deleting the rests of the hazardous waste, which cannot be disposed on the spot or would be non-efficient, dangerous or contrary to the law.

Exporting the creosote residue semi-fluid mass and full decommissioning of the tank





**Separation of old heaps;  
Extraction and dismantling of  
the existing infrastructure;  
Selection of all types of wastes  
and crushed materials;**





**Exact selection of the excavated material;  
Soil sifting before soil washing;**





**Different types of contaminated soils;**

**Different ways of excavation;**

**Selection for soil washing process;**



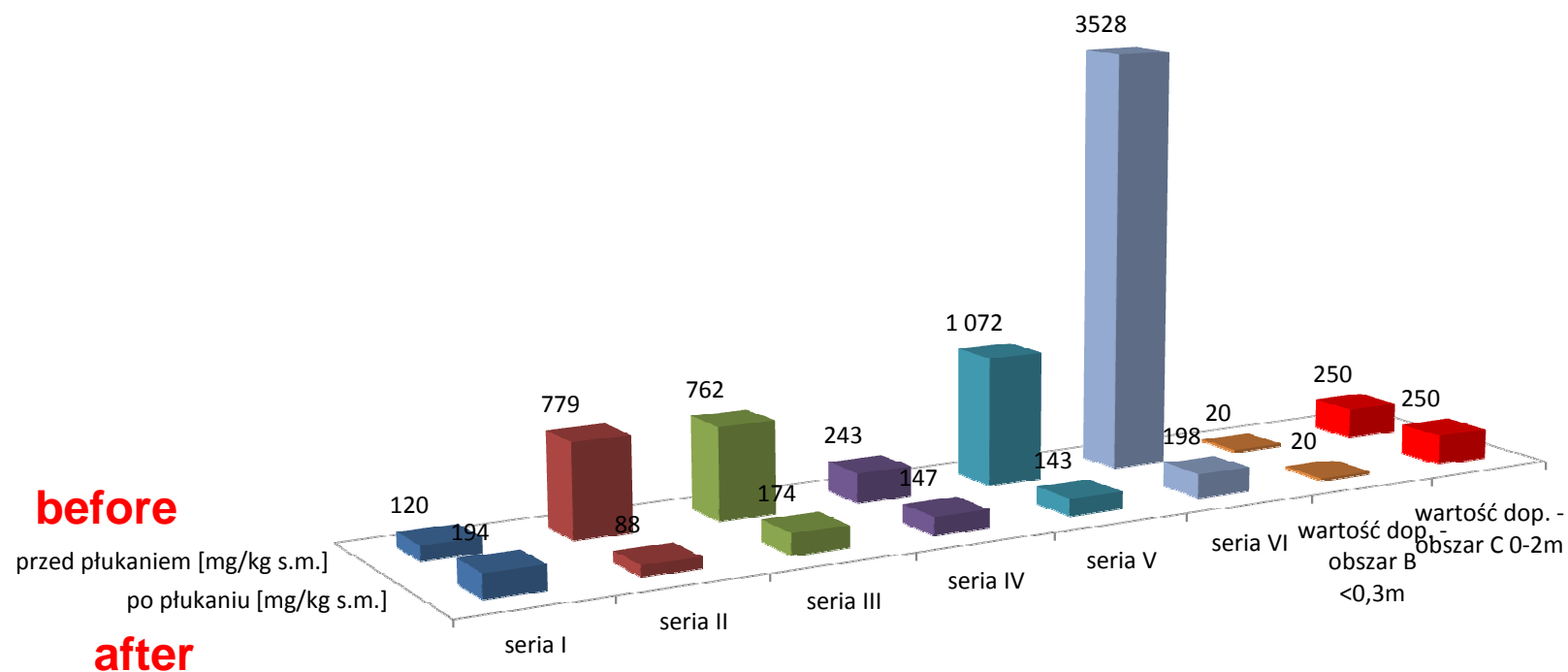


## Soil washing and soil crushing – the powerful machines





## The average concentrations of sum PAHs in different types of soil before and after the washing process





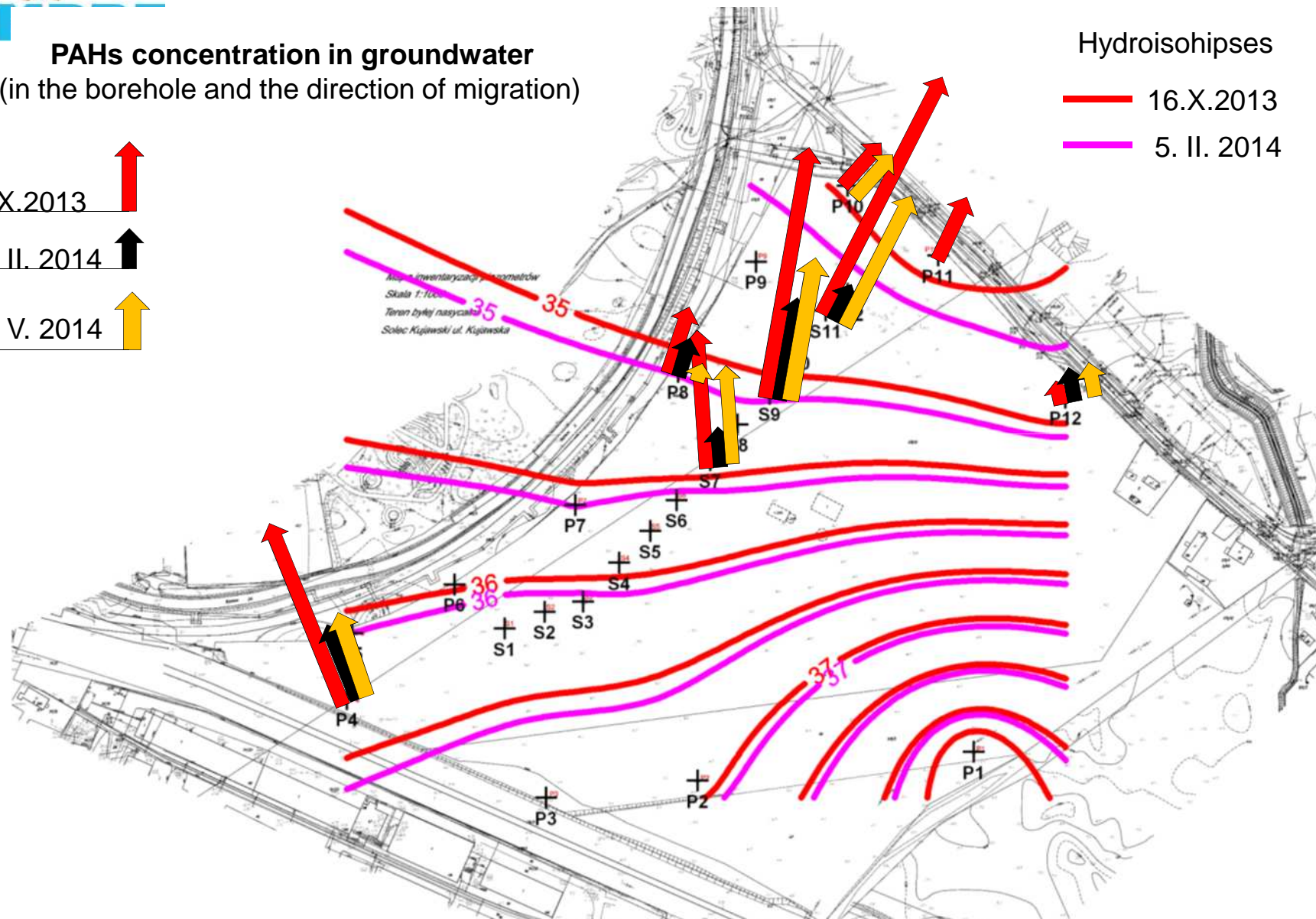
# Groundwater under control

**PAHs concentration in groundwater**  
(in the borehole and the direction of migration)

Hydroisohipses

- 16.X.2013
- 5. II. 2014

- 16.X.2013 ↑
- 5. II. 2014 ↑
- 6. V. 2014 ↑







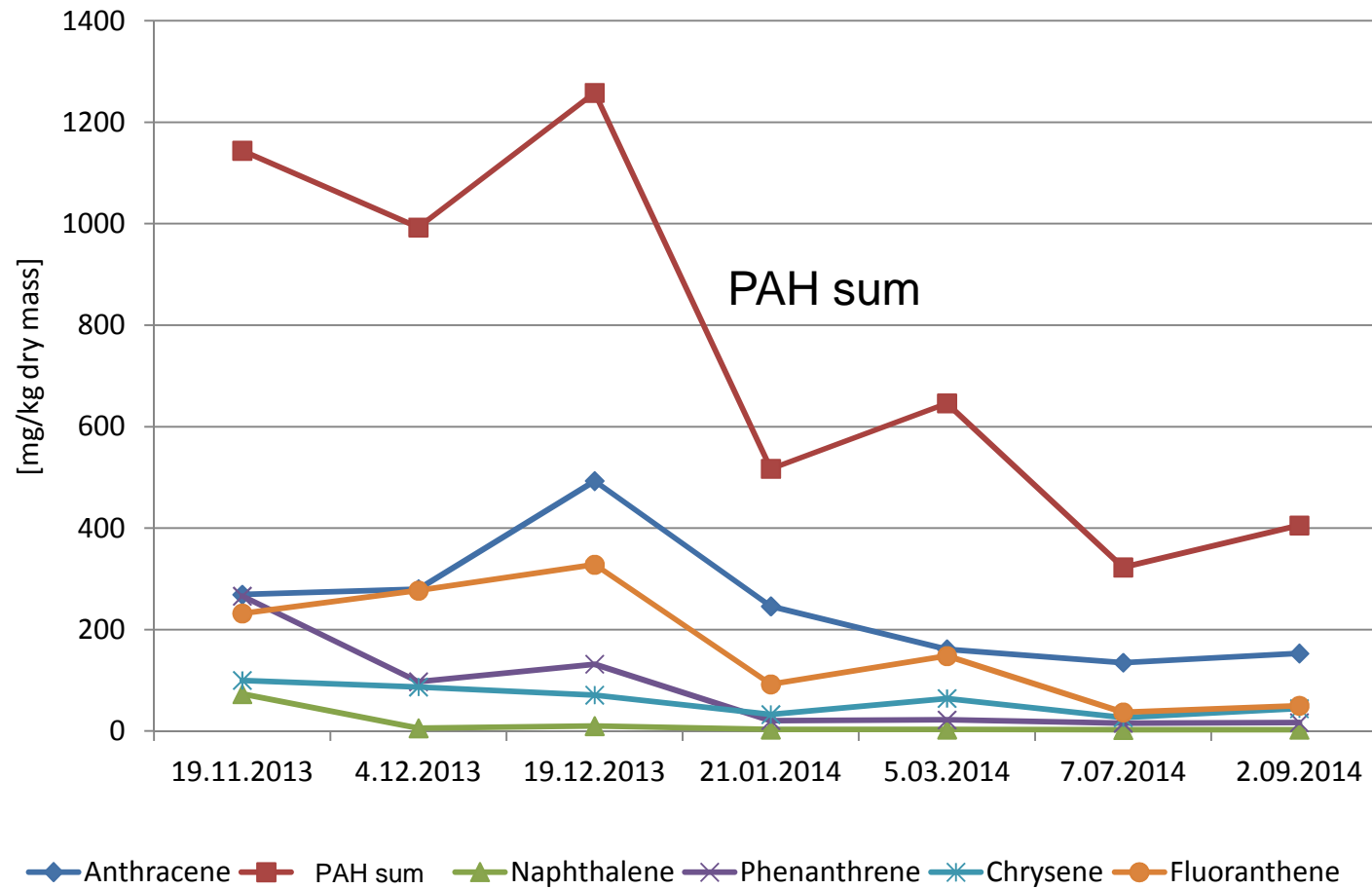
### **Bioremediation in steps:**

- ✓ **Bio-mixture production using autochthonous microorganisms;**
- ✓ **Inoculation;**
- ✓ **Watering**



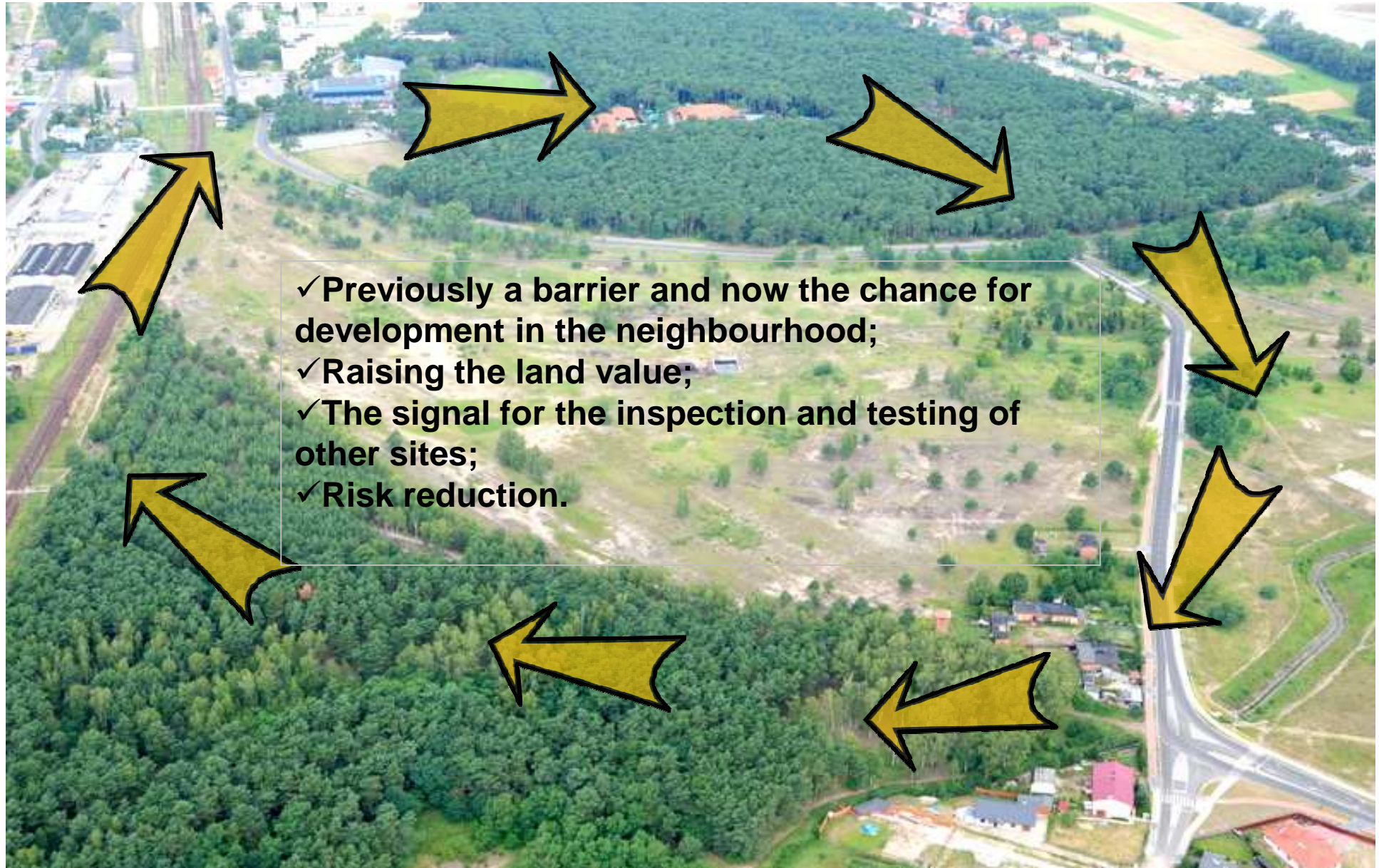


## Decrease of pollution in the washed soil using bioremediation





## Around the regeneration project **Neighbourhood sphere**





**Constructing of new housing estate - by private developer – on the neighbourhood are (supply of land for the construction of new homes)**





## Around the regeneration project **technical sphere**



- ✓ Reducing the costs of redevelopment;
- ✓ Technological Train



**Bioprism – longterm biodegradation = anti-noise barrier**





## Around the regeneration project social and administrative spheres

- Increase of knowledge;
- The local brownfield sites list;
- Awareness – it is possible to deal with;
- Spatial planning using Early Indicators;
- Public acceptance for technology;
- Hope for development;
- Hope for the better life.





Protozoans from Solec capable of PAHs biodegradation



Faithful reconstruction of the Jurassic period invites tourists and school trips to the Jurassic Park





**INFRASTRUKTURA  
I ŚRODOWISKO**  
NARODOWA STRATEGIA SPÓJNOŚCI



SOLEC KUJAWSKI

**UNIA EUROPEJSKA**  
FUNDUSZ SPÓJNOŚCI



**The remediation project is co-financed by EU Cohesion Fund for National Program „Infrastructure and Environment” and by Solec Kujawski Municipality**

**The HOMBRE analyses and studies were feasible using co-financing of EU 7th Framework Program**

**Thank you for your attention**

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