Design of a Large-scale Remediation Approach of a Heavy Polluted River

SedNet – June 14, 2017

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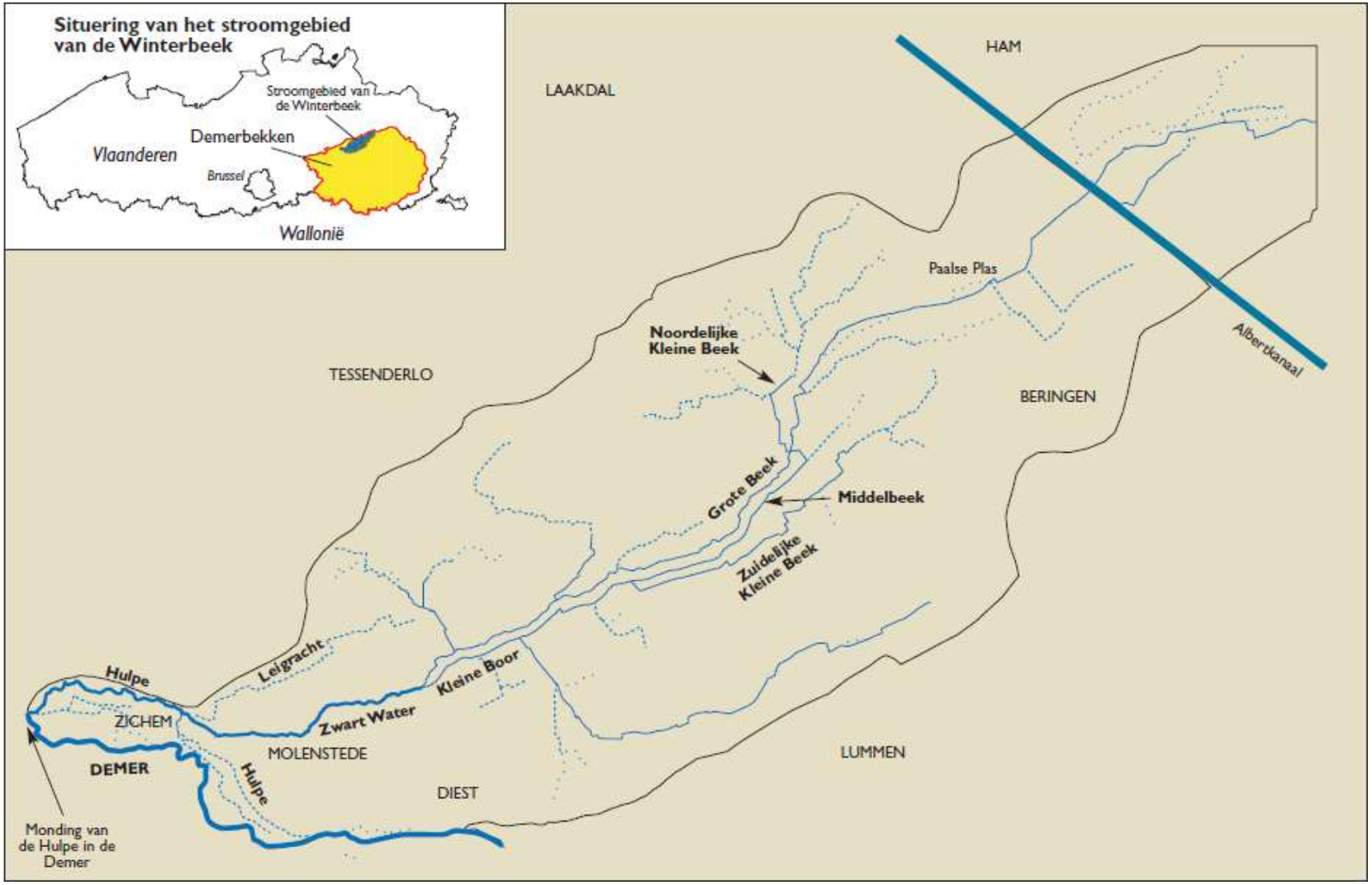
Vlaamse overheid

anteagroup

Problem situation



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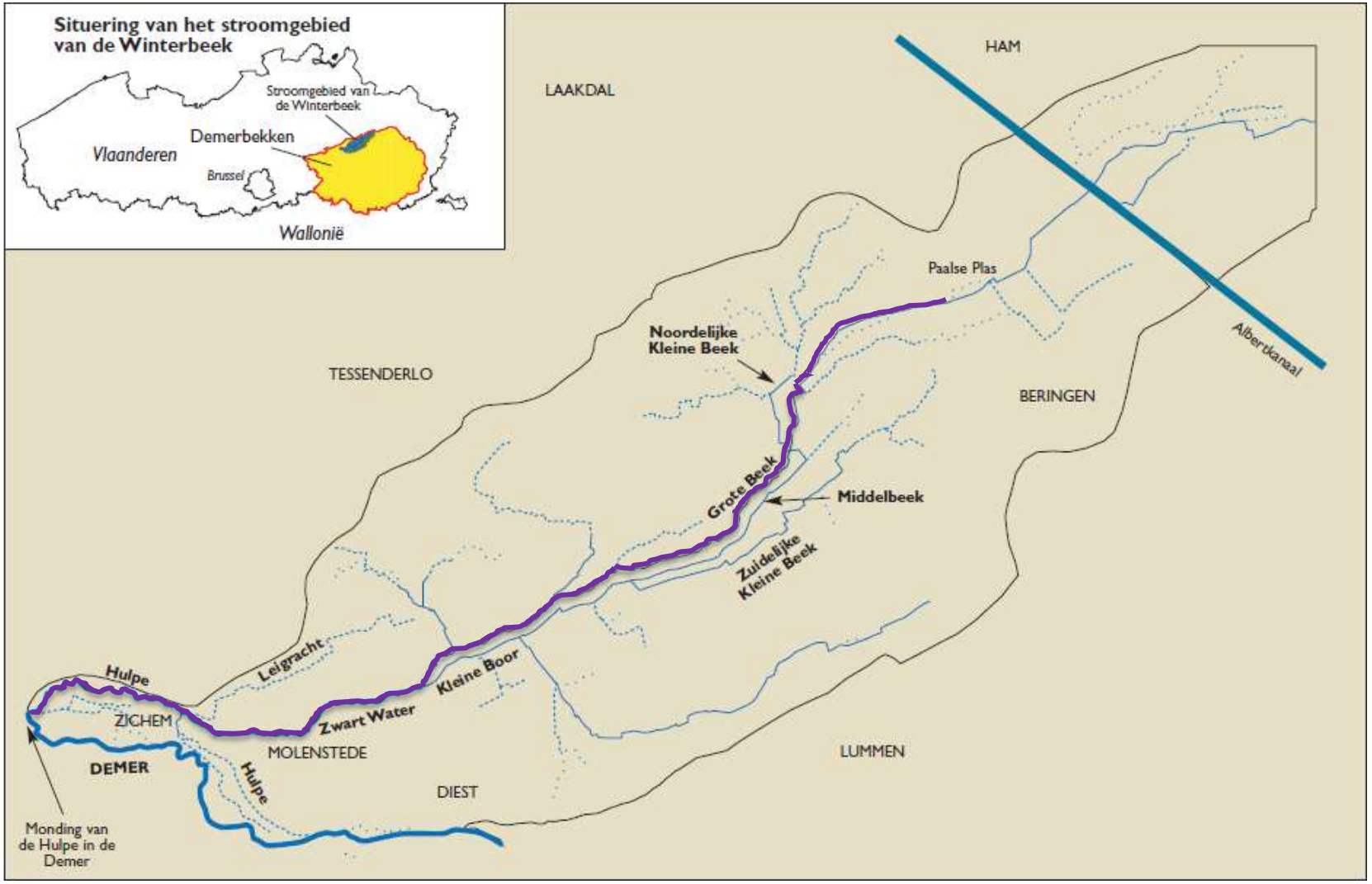

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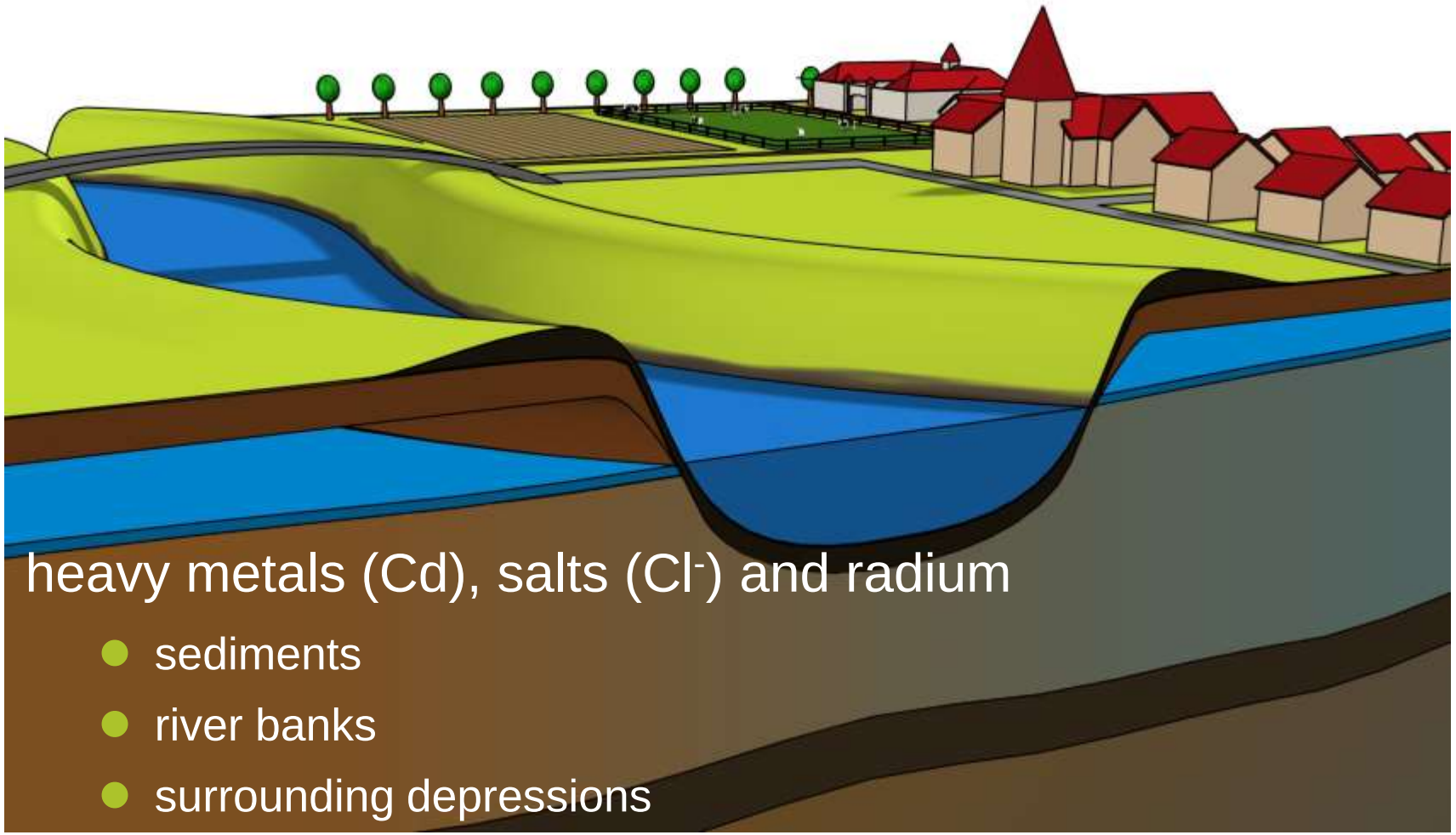


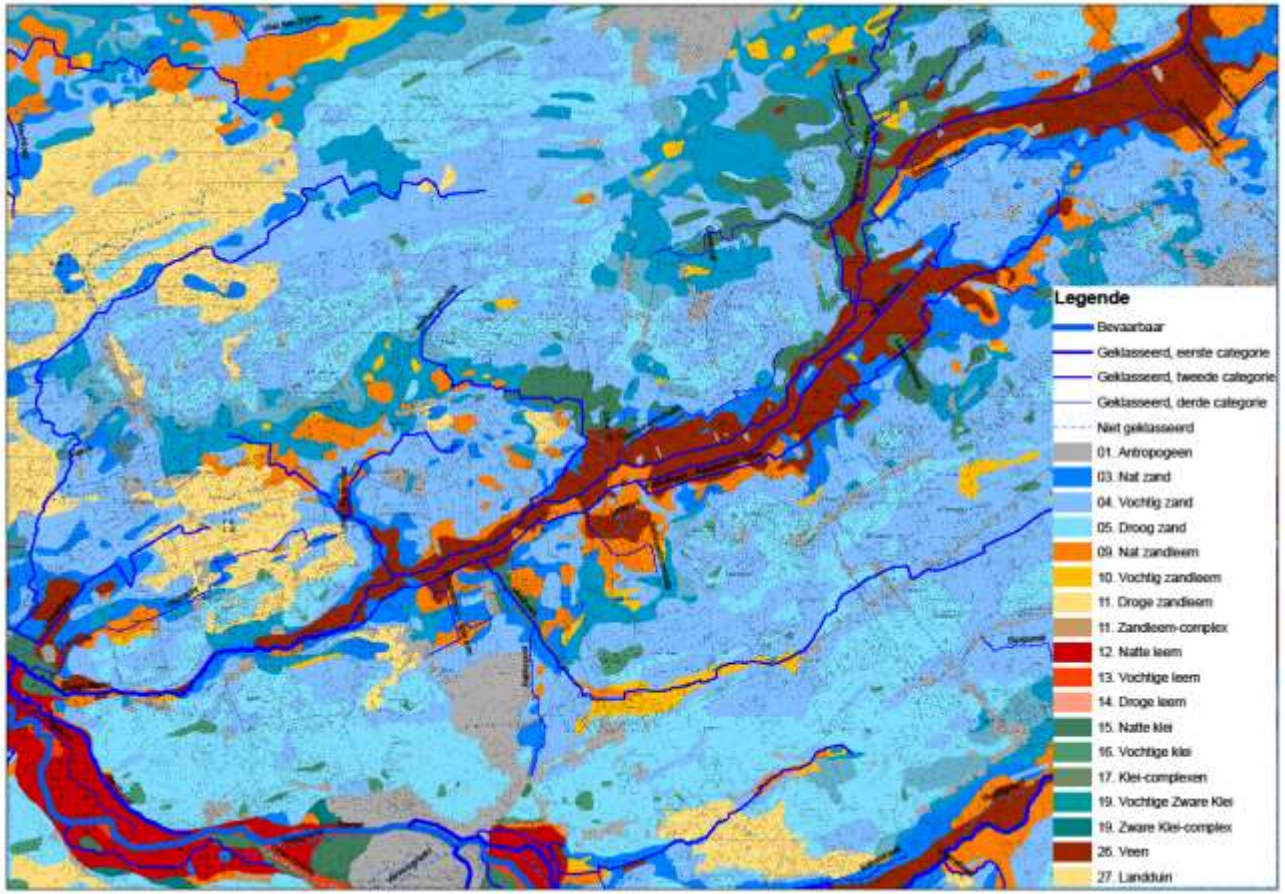
Problem situation

Goal

- Historical pollution (origin < 1995)

⇨Elimination of risks according to the BATNEEC principle

Problem situation



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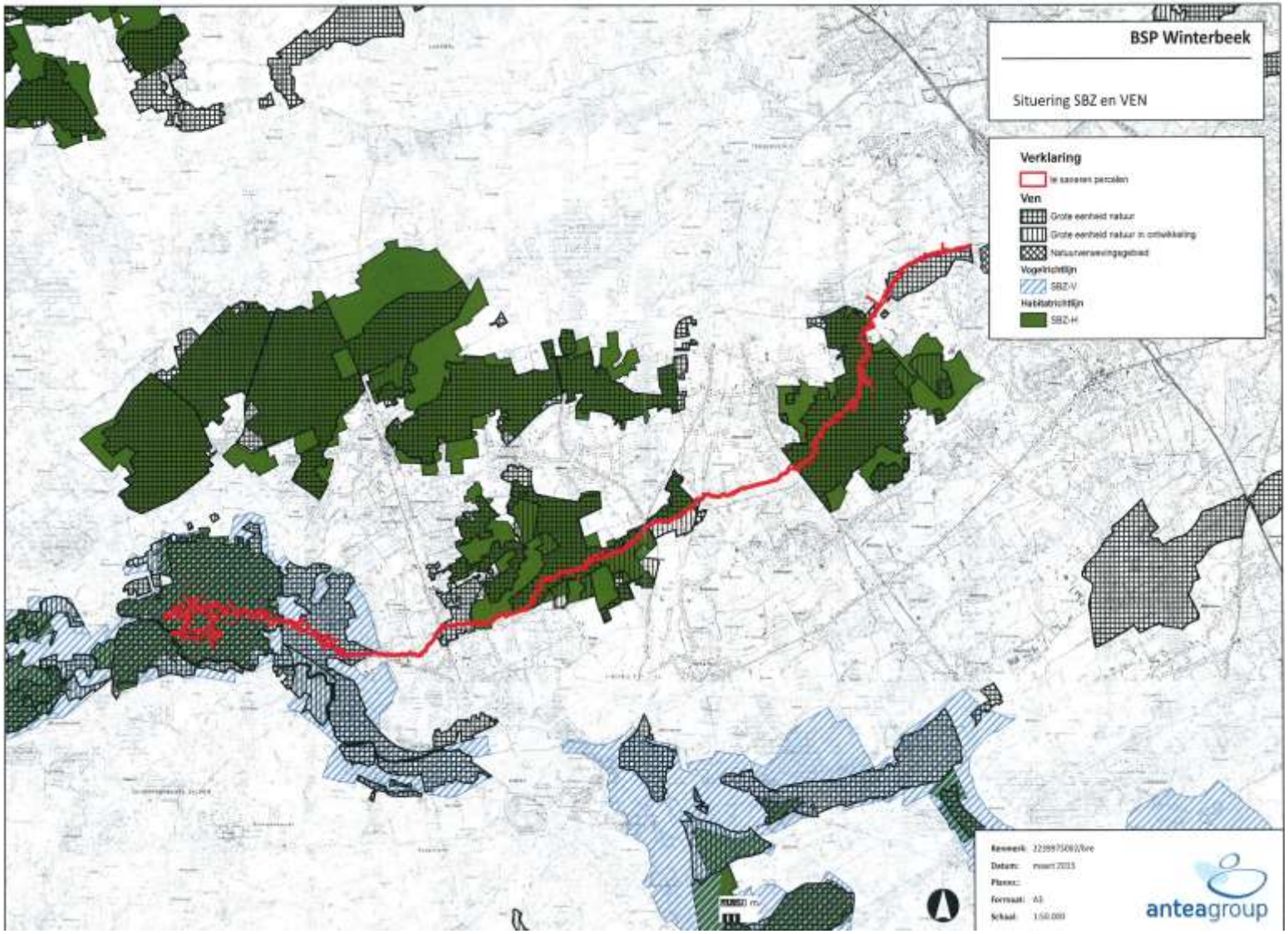


Approach

- risks caused by the contamination
- possible techniques and expected results
  - ecological impact / effect on soil structure
  - accessibility
  - other damage / negative effects
- Costs

⇨ Most suitable remediation

River bank / surrounding depressions

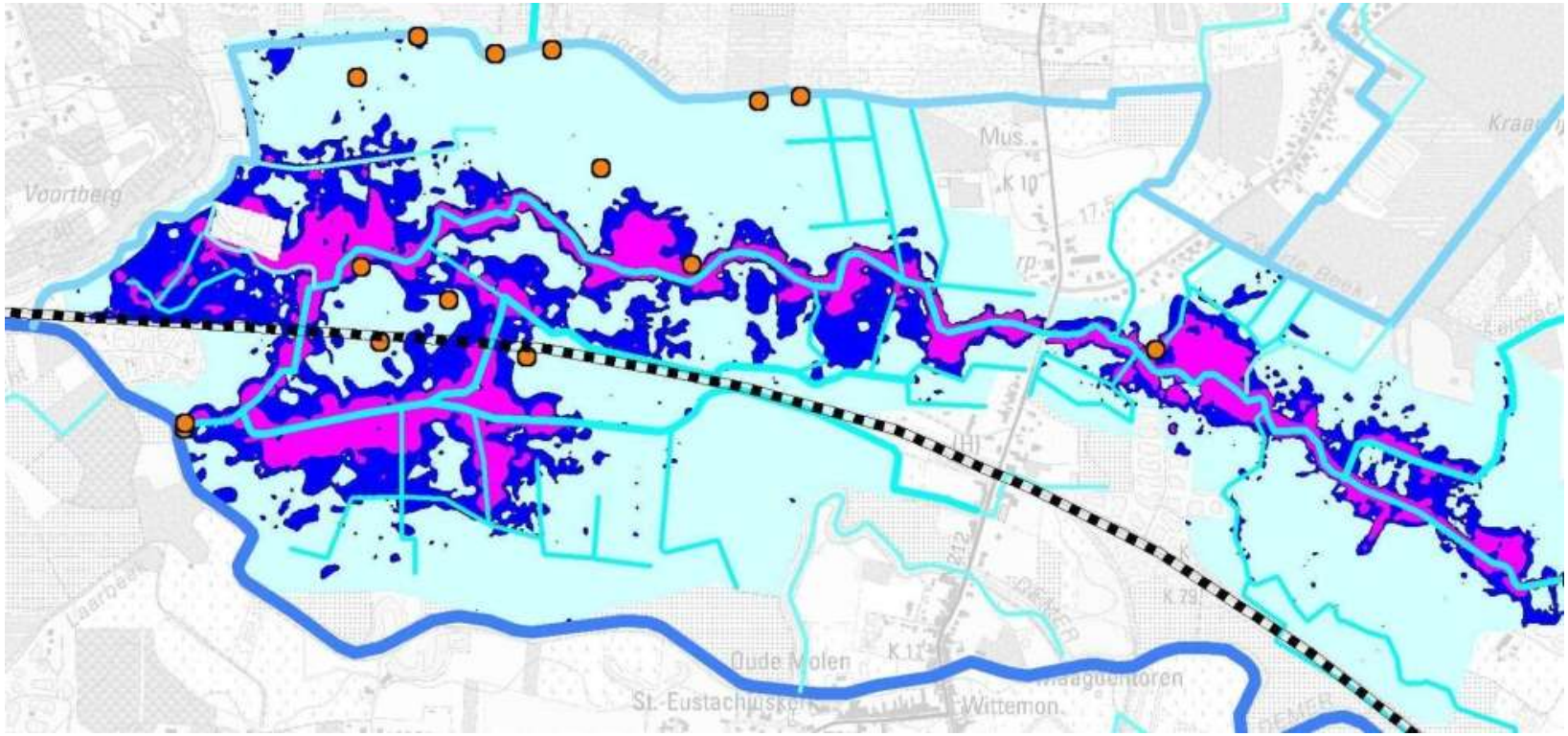
Problem

- soil contaminated with heavy metals (including radium) and chlorides by floods and applying sludge on the river bank

Extend

- surface: 63,5 ha
- depth
  - river bank: 0,5 to >1,5m
  - surroundings: 0,3m

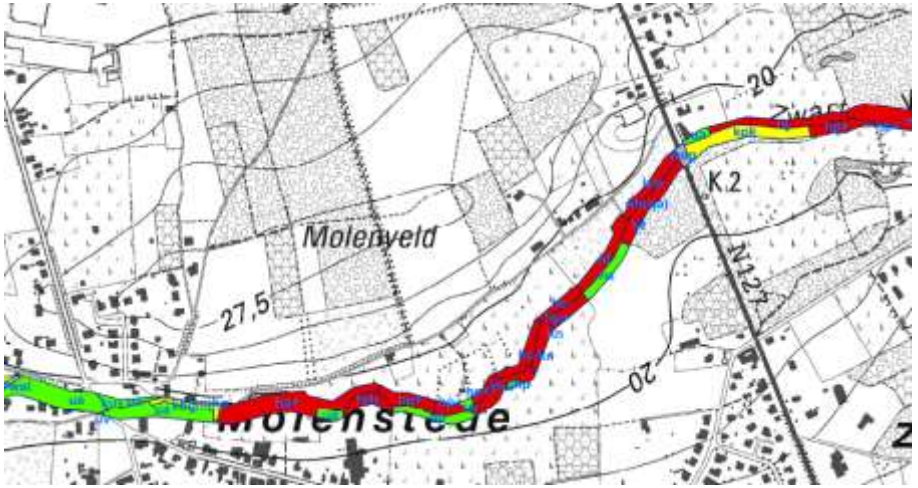
River bank / surrounding depressions



River bank / surrounding depressions

Assessment ecological impact: comparison damage / benefit

- classification according to vulnerability



	Extremely vulnerable	Vulnerable	Little fragile
Surrounding	80%	7%	8,5%
River bank	10%	90%	

River bank / surrounding depressions

Assessment accessibility

- criteria
  - min. 5m
  - bearing capacity subsoil
  - ground water level
  - current use

River bank / surrounding depressions

Assessment accessibility

classification river bank:

- good accessibility
- poorly accessible (1x) after clearing vegetation,…
- not accessible

River bank / surrounding depressions

Restrained scenario (active approach)

- excavation where feasible until
  - risk based clean up level
  - groundwater level

⇨approx. 46.000m³

Sediment

Problem

- Sediment / underlying layers contaminated with heavy metals
- 17 km

Restrained scenario

- dredging sediment and underlying soil

⇨ approx. 34.000m³

  - add clean sediment/soil
  - riffles (wooden poles)

- Sediment traps

Sediment

Practical implementation

- Dredging/excavation: mechanical (caterpillar) or hydraulic
- Low accessible areas: sediment/slurry removed by high-pressure tubing to the dewatering zones

Sediment

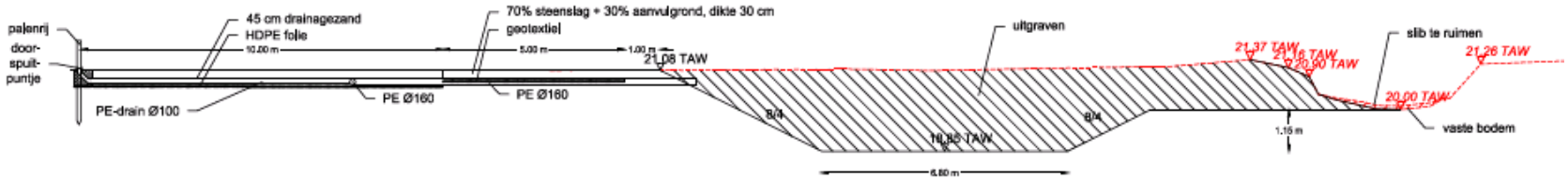
Practical implementation

- Drained by geotubing or lagooning

Sediment

Practical implementation

- Sediment traps



Questions?

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