



Federal Ministry
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HELMHOLTZ
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RESEARCH - UFZ

MNA in Germany – A Brief Review –

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MNA “Made” in Germany

- The Driver:



- Funded by the German BMBF (Federal Ministry of Education and Research)
- Project duration: 2002 – 2007
- 60+ projects
- Real sites (23)
- Budget > 20 Mio. Euro

Funding Priority KORA – Details (1)

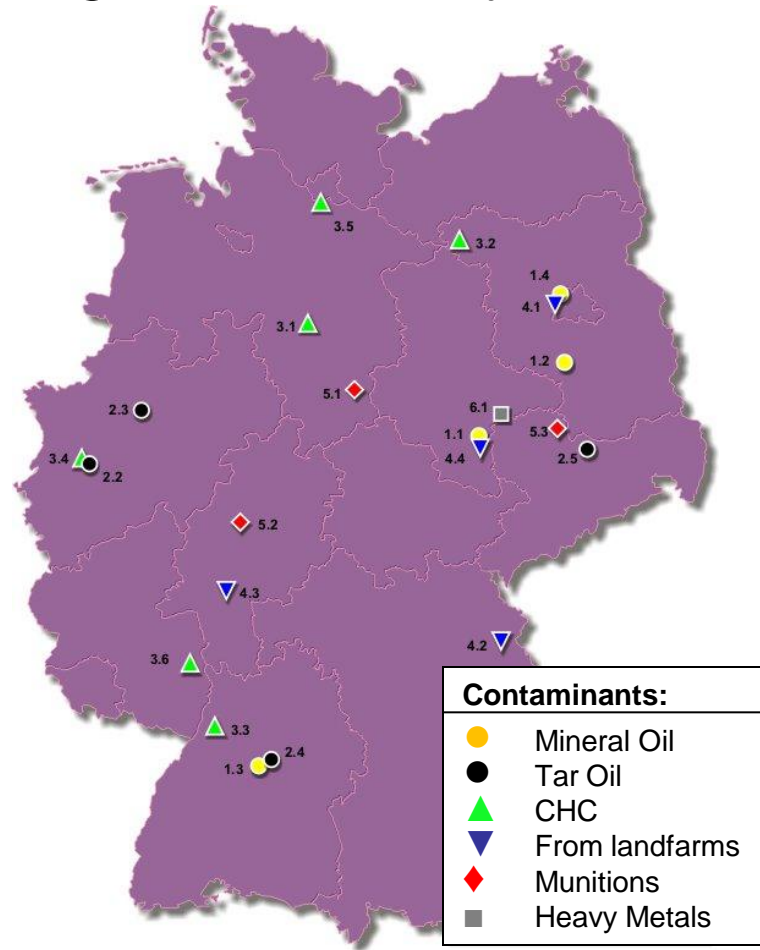
- 8 Thematic networks
 - TN 1: Refineries, fuel tanks, fuel/mineral oil, MTBE (TPH, BTEX, MTBE)
 - TN 2: Gas works, coking plants, coal tar processing, (wood) preservation (PAH, BTEX, coal tar, heterocyclics)
 - TN 3: Chemical industry, metal processing (Municipal waste)
 - TN 4: Landfills, abandoned waste disposal sites (Household waste, chemical wastes, ammonia)
 - TN 5: Former munitions works (nitro aromatics)

Funding Priority KORA – Details (2)

- TN 6: Mining and sediments (acidic water, heavy metals, DDT, HCH)
- TN 7: Prognosis, modeling
- TN 8: Evaluation, legal issues, acceptance
- 5 Cross Section Topics
 - Sampling, investigation, monitoring
 - Microbiology, isotopes
 - Geology, investigation
 - Transport, modeling
 - Legal aspects

Funding Priority KORa – Details (3)

- 23 Sites Throughout Germany



Funding Priority KORA – Details (4)

- The products:
 - Sector guidelines from the thematic networks 1 to 6.
 - Recommendation handbook with contributions from thematic networks 7 and 8
 - Compilation of methods (analytical, microbiological, sampling), site descriptions
 - Available at: <http://natural-attenuation.de>

...

- And: “LABO – Positionspapier” as legal framework (http://www.labo-deutschland.de/documents/MNA-Positionspapier_Stand_10-12-2009_e51.pdf)

MNA Research – Lessons Learnt

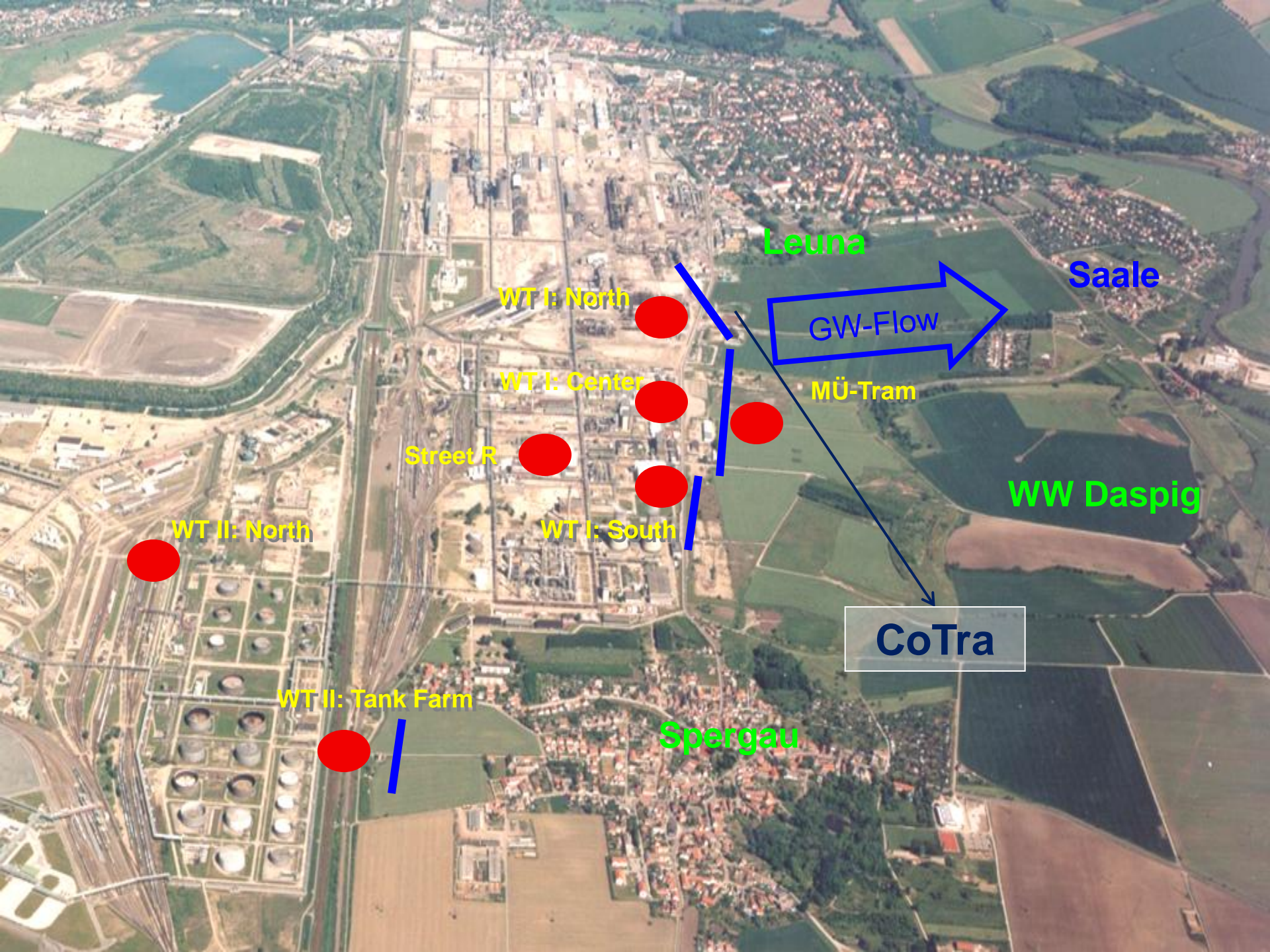
- Focus on the source-pathway-receptor approach
- Implementation of the mass flux concept
- Importance of source zone management
- “MNA-Methods” suited for the daily praxis in contaminated site management, e.g.:
 - *Direct-Push* based site investigations
 - Depth oriented groundwater sampling
 - Immission pumping tests for mass flux estimation
 - Stable isotope monitoring

MNA 2012 in Germany ... And Beyond (1)

- Implementation of MNA concepts as part of contaminated site management is daily practice
- More than 100 MNA cases have been notified by local agencies in a survey of the German Bundesländer (the real number of cases is presumably higher)
- Contaminants of concern: PAH/heterocyclics, TPH/BTEX, CHC, ammonia
- MNA in combination with remedial actions eg. Source zone removal)
- Accepted MNA timeframes range from 3 to 30 years

MNA 2012 in Germany ... And Beyond (2)

- Open scientific questions:
 - delineation of source zones, understanding of release mechanisms and processes in the source zone
 - Estimation of the real costs for the implementation of a MNA concept
 - Applicability of MNA under different climatic conditions (e.g. in South America – case study in Sao Paulo)
- MNA – extended concepts
 - The Leuna case: use of natural attenuation processes as megasite remedial option



Leuna

Saale

WT I: North

WT I: Center

Street R

WT I: South

WT II: North

WT II: Tank Farm

Spergau

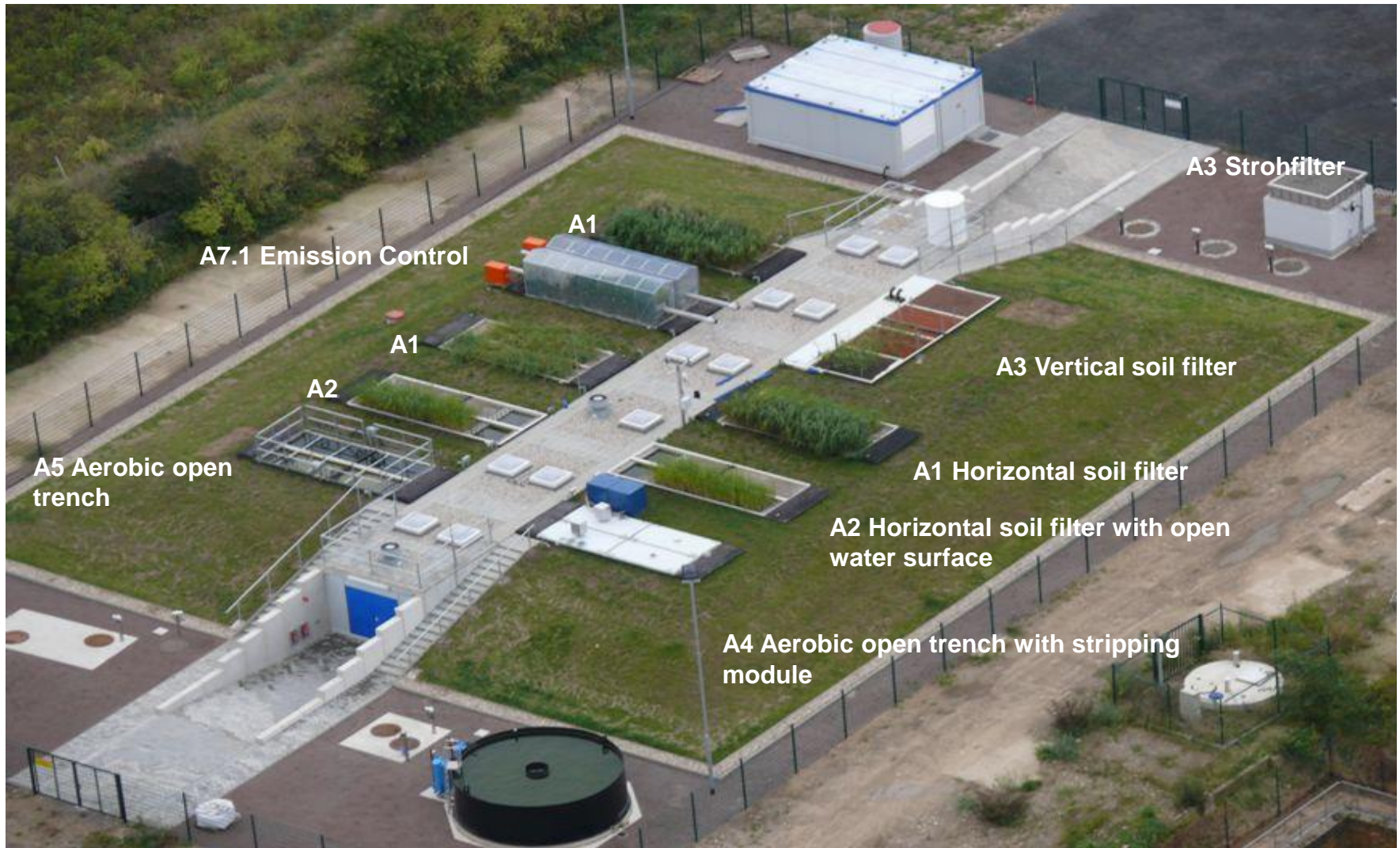
WW Daspig

GW-Flow

MÜ-Tram

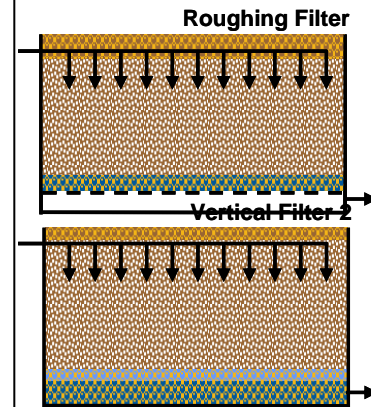
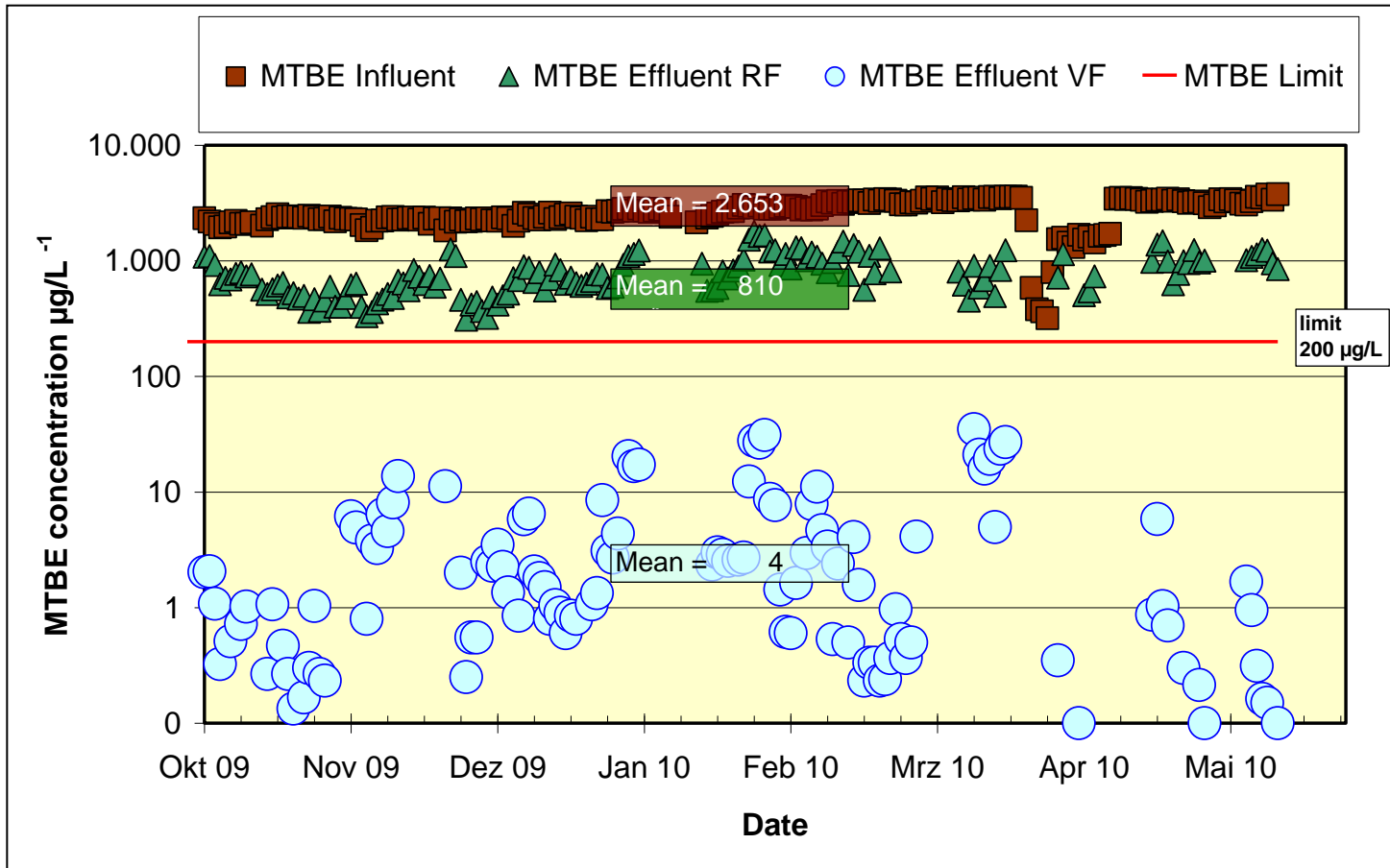
CoTra

Pilot Facility in Leuna (CoTra) - Overview



Contaminant Removal Efficiency

Vertical-flow filter - MTBE Removal Performance



Thank You For Your Attention

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