

Large scale *in-situ* bioremediation of BTEX

Problems:

- Former production area with storage facilities and lab
- Underground services left in place
- 5 000 µg BTEX/litre (BTEX: benzene, toluene, ethylbenzene, xylenes)
- Hot spot area 15 100 tons of soil affected in the saturated zone, 21 000 tons in the unsaturated zone
- Very permeable gravel and sand
- Contamination at boundary
- Sensitive targets at boundary such as private housing, kindergarten

Our Responses:

- Bioremediation feasibility study undertaken proving that the diffuse BTEX contamination can be degraded within the boundaries of the site after removing hot-spots with high ecotoxicity.
- Containment wells installed to prevent off-site groundwater migration
- Existing foundation repaired to be used as cap
- Volatile sources removed with soil vapour extraction
- Aerobic biodegradation implemented using biosparging / water infiltration / soil vapour extraction / biofiltration / on-line monitoring

Location: Area A/B/TF1 West, Germany

Initial cost estimates using standard technologies: 5 100 – 11 900 k US\$

Actual costs using *in-situ* bioremediation: 2 840 k US\$

Time for active *in-situ* remediation : 1,5 years