Brownfield management and recycling German Railway group

(FRS)
Brownfield

Alker suggests the following “core” definition of the concept of a brownfield site:

“A brownfield site is any land or premises, which has been previously used or developed, and is not currently fully in use, although, it may also be partially occupied or utilised. It may also be vacant, derelict or contaminated. Therefore a brownfield site is not necessarily available for immediate use, without intervention.”
The brownfield is primarily based on three corner stones:

- the continuous amelioration of the city image and urban structure
- the development of social and cultural options
- the extensive involvement and care of the community

Based on these cornerstones the overall goal is to support sustainable economic development, competitiveness, integrated planning policy and help safeguard improving the quality of life and cultural identity of citizens.

This emphasizes an increasing citizen and stakeholder participation in urban decision making processes and helps to ensure the availability of reliable, efficient and affordable services for all urban citizens, including those with special needs.

Major topics of the Sustainable Cities Report

- management of natural resources
- the urban economy
- social issues
- mobility and accessibility
- urban regeneration
- cultural heritage and tourism
- land
- use planning
Brownfield recycling

Scientific basis of brownfield recycling: tetrahedron

Basis:
- each of the four corners is linked to the other three corners in an equivalent connection
- all sides are of equal length and all side-planes are of equal size

Summary: the tetrahedron is therefore especially suited to visualize the relationship of four interconnected factors of balance importance
Brownfield recycling

Scientific basis of brownfield recycling: recommendations for tetrahedron

Recommendations

derelict land Reclamation

- Creation of a legal basis to separate soil and groundwater remediation for faster realization of secondary usage
- Harmonization / standardization of soil utilization and disposal management

Profitability

- Content definition of overall feasibility study
- Amendment of valuation process

Utilization

- Development of political guidelines by local authorities
- Methodical specification of a master plan for land recycling

legal framework

- Owner release after completed remediation
- Review of the official and administrative structures and concentration of authority and expertise
- Development of political guidelines for land recycling by federal, state and local governments
Brownfield recycling

Scientific basis of brownfield recycling: recommendation for different groups

Main recommendations for consultants

- Find an agreement with your client about the overall targets.
- Implement a project handling procedure. The client should set up the goal.

Main recommendations for authorities

- Complete on-site situation should be the basis for any public decision. Be flexible in integrating the overall targets into the town or state planning strategy.

- Similar handling of public and private contaminated properties should be provided by the different public organisations.

Main recommendations for property owners

- Internally structurize your company related property management and fix your assessment-, remediation- and development strategy according to the contamination needs.

- Integrate knowledge for land recycling in to your management and make sure that every department provides special management know-how.
Brownfield recycling

View of investors

Public sensitivity regarding contamination will rise and force investors towards “clean” conditions. Public opinion and a region’s reputation are important criteria for the use of the land.

1. The cost criteria for decontamination is only a calculation criteria, not a decision criteria.

2. Completely decontaminated land is not clean land but only decontaminated land. The shortfall between decontaminated land and clean land is the damage to image.

3. In the future European and global economic development will concentrate more and more in fewer but much more intensive locations. This means that real economic development requires land without any controversy about contamination. Politicians are obliged to ensure that contamination will not impair economic development.

4. In Europe and the States there will in future generally be more space available for economic activity than is in demand. In certain areas in Asia space for economic activity will be in short supply.

5. Reduced product life cycles and structural changes in the global economy including a more powerful Asian region will change the use for land and properties in many parts of the world. In many parts of the world used and contaminated land will be left over.

6. The demographic chance in population will change the use of land.
Brownfield development

A: projects
- limited direct involvement from public / government agencies
- the private developer acquires, prepares for demolition, provides funding, coordinates planning
- Result 60% development for housing 40% for commercial space

B: PPP-projects
- closed cooperation between landowner, developer and local authority
- various stages of the development processes are regulated through agreements, contracts and covenants
- support can be given in different forms, such as: - grant aid, - support for loans - guarantees
- partnership projects contain risk and profit sharing

C:
- no private sector funding in brownfield redevelopment is available
- strategic approach is focussed on a long term and regional perspective
- the properties are managed on a regional level and in individual cases left to the free property market
- direct support by government / regional funding
- authority following overall strategy to develop former industrial region

Diagram:
- A: private-driven projects
- B: public-private partnership
- C: public-driven projects

land value
(after reclamation)
reclamation cost

Mobility Networks Logistics
Soil and groundwater contamination

- Until 1999 soil and groundwater contamination was handled individually by the 16 federal states, mostly according to their general policy and water law.
- In March 1999 the enactment of the federal soil Protection Act came into force. The Act aims to protect the soil against future deterioration and provides for liabilities and remedial measures for existing contamination. An ordinance sets out threshold values on which contamination risks must be evaluated.
- Under the Federal soil Protection Act, several persons/entities can be held liable:
  - the polluter
  - the legal successor
  - the operator
  - the owner
  - a former owner, if he transferred the property after March 1st, 1999
  - the person/entity responsible under general principles of commercial or corporate law for the legal entity owning the site

- If there are sufficient indications for suspecting a site has been contaminated, the competent authority may require the responsible persons to carry out an assessment at their own expense to determine the degree of environmental damages.
- If there is evidence of a threat to the environment or environmental damage, the authority is allowed to order remedial action.
- In addition to the federal soil Protection Act the closed substance cycle and waste management Act is in place specially for handling of waste and soil during the investment. Recycling and incineration of waste to produce energy have equal status under the Act.
Especially for brownfield recycling a platform has to be fixed. The public contract (f.e. Städtebaulicher Vertrag) would be the fundamental base to cover the ideas of all public groups into the project.

Public contract would have the following advantages:

- Instead of an administrative injunction in which the authority specifies the measures to be executed by the liable party.
- To gain approval for a purposed remediation plan on that condition development plan or planning permission prior to completion of the remediation can be achieved.

Concluding a contract enables appropriate joint solutions to be found and obligations to be divided within the legal framework.

Based on this circumstance the reflection of external impacts to brownfields has to be considered.

Following questions are open:

- Migration movements
- Demographic aspects
- Infrastructure investment and availability

The legal aspects contained in environmental statues specially the closed substance cycle and waste management act, the federal water act and the federal soil protection act.

Here are some important definitions:

- **Waste** is a movable property of which a person rids himself, wishes to rid himself or must rid himself. The act distinguishes between waste for recycling or waste for disposal.

- **Soil contamination** the appropriate measures are to taken to the person / entity that directly caused the situation, i.e. the polluter or the site / facility owner.
A public contract for decontamination actions called remediation-contract (Sanierungsvertrag):

- contract provides the actions according the act between environmental authority an the person(s) liable for remediation

- such agreement may involve third parties (e.g. other obligated parties or future site owners)

- the authorities are bound to the agreed remediation target and cannot require additional action. It is only if the inherited basis of the contract is changed that the authority can demand an adjustment or the termination of the contract.

- remediation contracts containing provisions which affected third parties. The need for consent is limited to the relevant provisions of the contract. If the contract is agreed without the necessary consent, the third party has the right to challenge the contract.
Brownfield risk management

Specially remaining risks when redeveloping contaminated and remediated land for further use may be:

- Risks resulting from not totally eliminated and non detected contaminants
- Risks which not have been relevant in the usage up to now
- Risks due to mobilisation of contaminants caused by changes in soil usage and construction measures
- Risks in the long term range, e.g. change of contaminants mobility and exposure, caused by natural and time-dependant processes

Following risk categories have to be considered:

- Legal risks
- Monetary / economic risks
- Health related risks
- Risks for conserving groundwater resources
- Ecological risks (remarking risks for the natural soil functions and flora and fauna)
- Technical risks
Revenue and Headcount Structure of the DB Group

Revenue structure (%)
- Infrastructure and Services: 5
- Transport and Logistics: 49
- Passenger Transport: 45
- Other: 1

2004 to 2005: +4.6%

Employees (%)
- Infrastructure and Services: 35
- Transport and Logistics: 30
- Passenger Transport: 25
- Other: 10

2004 to 2005: -4.1%
Crucial development paths

- Ongoing modernization and optimization of rail transport in Germany
- Optimized mobility offerings across various modes of transport in the domestic market
- Prospects for the European market: additional opportunities for growth in rail transport as liberalization also advances in neighboring countries
- Participation in above-average growth opportunities in domestic, European and global transport and logistics markets
- Further efficiency gains through the consistent implementation of our internal programs
Market positions of the Passenger Transport Group Division

# 1 in Rail Passenger Transport in Europe 2004 (€ billion)
- DB 9.9
- Trenitalia 3.4
- National Express 2.4
- SBB 1.7

# 1 in Regional and Urban Transport in Europe 2004 (€ billion)
- DB 8.2
- SNCF 6.1
- Veolia 2.9
- National Express 2.7
- First Group 2.6

All data on competitors is based on annual or interim reports, independent research or in-house estimates.
Market positions of the Passenger Transport Group Division

- # 1 in European rail freight transport
- # 1 in European land transport
- # 2 in air freight
- # 3 in sea freight

# 1 in Rail Freight Transport in Europe 2004 (billion tkm)

- DB 84
- PKP 48
- SNCF 45
- Trenitalia 23
- RCA 19

All data on competitors is based on annual or interim reports, independent research or in-house estimates.
## Strong Revenue Growth to € 25.1 Billion

### Group revenues

<table>
<thead>
<tr>
<th>€ million</th>
<th>2005</th>
<th>Share</th>
<th>2004</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DB Group - actual -</strong></td>
<td>25,055</td>
<td></td>
<td>23,962</td>
<td>+ 4.6%</td>
</tr>
<tr>
<td>of which from</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MITROPA AG, Deutsche Touring GmbH</td>
<td>-</td>
<td></td>
<td>(83)</td>
<td></td>
</tr>
<tr>
<td><strong>DB Group - comparable -</strong></td>
<td>25,055</td>
<td></td>
<td>23,879</td>
<td>+ 4.9%</td>
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### External revenues by business unit

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<thead>
<tr>
<th></th>
<th>2005</th>
<th>Share</th>
<th>2004</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-distance Transport</td>
<td>3,068</td>
<td>12%</td>
<td>2,922</td>
<td>+ 5.0%</td>
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<tr>
<td>Regional Transport</td>
<td>6,452</td>
<td>26%</td>
<td>6,437</td>
<td>+ 0.2%</td>
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<tr>
<td>Urban Transport</td>
<td>1,708</td>
<td>7%</td>
<td>1,688</td>
<td>+ 1.2%</td>
</tr>
<tr>
<td>Schenker</td>
<td>8,878</td>
<td>35%</td>
<td>8,024</td>
<td>+ 10.6%</td>
</tr>
<tr>
<td>Railion</td>
<td>2,830</td>
<td>11%</td>
<td>2,907</td>
<td>- 2.6%</td>
</tr>
<tr>
<td>Stinnes</td>
<td>718</td>
<td>3%</td>
<td>638</td>
<td>+ 12.5%</td>
</tr>
<tr>
<td>Track Infrastructure</td>
<td>511</td>
<td>2%</td>
<td>480</td>
<td>+ 6.5%</td>
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<tr>
<td>Passenger Stations</td>
<td>287</td>
<td>1%</td>
<td>268</td>
<td>+ 7.1%</td>
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<tr>
<td>Services</td>
<td>124</td>
<td>1%</td>
<td>163</td>
<td>- 23.9%</td>
</tr>
<tr>
<td>Energy</td>
<td>207</td>
<td>1%</td>
<td>131</td>
<td>+ 58.0%</td>
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<tr>
<td>Other / consolidation</td>
<td>272</td>
<td>1%</td>
<td>304</td>
<td>- 10.5%</td>
</tr>
<tr>
<td><strong>DB Group</strong></td>
<td>25,055</td>
<td>100%</td>
<td>23,962</td>
<td>+ 4.6%</td>
</tr>
</tbody>
</table>

### Revenues by region

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>76%</td>
<td></td>
</tr>
<tr>
<td>Europe (ex Germany)</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Global (ex Europe)</td>
<td>6%</td>
<td></td>
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</tbody>
</table>

1) Based on segment revenues = external revenues plus other external segment revenues
Property of German railway group

- Since 01.01.1994 the German railway corporation is in progress specially running the operation including construction and development f.e. railway stations.

- According to the balance the German railway corporation is one of the huge private property owners in Germany with nearly 1.400 mill. square meter.

- About 1.000 mill. square meters belong to the DB Netz AG, which is responsible for construction and operation the railway system itself.

- Nearly 12 mio. square meters belong to DB Station&Service AG, which is responsible for operating the railway stations.

- The rest belongs to the DB Holding including f.e. DB Energie.

- Concerning the German railway privatisation law about 60 mio. square meters have to be transferred to a governmental property company today Vivico Real Estate as a kind of compensation for taking over the liabilities of Deutsche Bundesbahn by the government.

- For handling the risk management of the contaminated sites in the opening balance there was a provision about 3,6 Bill. Euro.
Overall strategy and activities

- Based on changes in the transportation market especially for goods and the market demands asking for international transportation capacity between cities the company had to stress their main core business.

- This implemented an evaluation process for the governmental authorities for developing such inner town areas as urban town. Precondition for selling to investors was the exact knowledge of the remediation situation especially of contaminations and others according the usage future.

- The activities introduced dismantling the former railway infrastructure, pulling down the buildings, forming an intensive utilisation of the demolished materials till to preparation of the foundation level.

- Deutsche Bahn AG invests since 1996 based on the 4-step-programm about 100 mio. Euro in research of the contaminated sites. Because of the interdisciplinary demands Deutsche Bahn AG installed a service center Sanierungsmanagement which is responsible arranging the interaction process between legislation and regulations, economical points of view, reuse concepts and site preparations. This service center assist at one side the real estate group and at the other side the owner and operator of the railway system.

- Nearly 200 engineers working in seven different agencies in Germany and handling the process activities including nearly round 2500 projects per year.

- The intelligent and target orientated connection creates solutions and perspectives for the transition process for brownfield in the urbanity usage. The strategy framework follows the basic risk as soil groundwater remediation based on the future orientated land use concept.
RESPONSIBILITIES
In DB AG corporation structure

- environmental investigation
- clean-up / site remediation
  **DB Sanierungsmanagement (brownfield recycling department)**
- preparing construction site
  **DB Services Immobilien (service real estate)**
- marketing
DB AG Strategic Framework

Soil / Groundwater Remediation + Land Use Concept = Management of Remedial Action
DB AG Strategic Framework

Guidelines

- **Soil / Groundwater Remediation is affected in accordance with the intended land use,**
  i.e. the future land use concept of internal and external users has to be specified and coordinated (user, DB AG, competent authority) before remediation action begins

- **Remediation is affected on a basis of preventive usage optimisation,**
  i.e. any new contamination must be avoided, or at least be reduced.

- **Soil / Groundwater Remediation is affected as one action package**
  divided into individual projects
The continuous process evaluation by strategic location concept and strategic action concept reflects the targets over the whole running period in detail. The strategy action concept includes the following points and was established as a controlling instrument.

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>General information</td>
</tr>
<tr>
<td>B</td>
<td>FRS-project-analysis</td>
</tr>
<tr>
<td></td>
<td>1. legal aspects</td>
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<tr>
<td></td>
<td>2. technical</td>
</tr>
<tr>
<td></td>
<td>3. economical</td>
</tr>
<tr>
<td></td>
<td>4. political / others</td>
</tr>
<tr>
<td>C</td>
<td>Targets</td>
</tr>
<tr>
<td>D</td>
<td>Strategy proceeding</td>
</tr>
<tr>
<td></td>
<td>1. Strategic solution</td>
</tr>
<tr>
<td></td>
<td>2. States project performance</td>
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<tr>
<td></td>
<td>3. Actual results</td>
</tr>
<tr>
<td>E</td>
<td>Organisation / responsibilities / partners</td>
</tr>
<tr>
<td>F</td>
<td>Controlling aspects actual expenses / savings</td>
</tr>
<tr>
<td>G</td>
<td>Next activities, dates and documentation</td>
</tr>
</tbody>
</table>
Identification of the Utilisation Risks to be eliminated with the 4-Stage Soil (Groundwater) Remediation Programme

**Concept for site remediation „Investment Project III“**
- Pre-planning
- Feasibility study
- Remediating target
- Detailed Investigation

**Result I**
- Optimised preservation or remediation procedure

**Result II**
- Remediated site

**Preparation for Land Use „Investment Project IV“**
- Recultivated site

**Strategy Action Concept**
- Land Use Concept
- Strategic location concept

**Risk assessment „Investment Project II“**
- Pre-planning
- Draft Plan/Execution of Orientating analysis Detailed Investigation

**Result I**
- Rough geographical location of contaminated areas

**Result II**
- Geographical specification of contaminated sites

**Data acquisition And Historical Research „Investment-project I“**
- Result Determination of sites suspected of having contamination

Prof. Dr. Jens-Uwe Fischer, DB AG, 06.11.06
Stage I  Historic Investigation

Project Targets

- Initial data acquisition on sites suspected of having inherited burdens
  (German Soil Protection regulations [BBodSchV] Section 3, Subs. 1 and 2)
- Settling of assumed inherited burdens:
  - unrestricted land use or
- Statement of reasons for indication of burdens / initial suspicion
  - selection of sites to undergo closer investigation (as part of orientational examination)

Procedures

- Data acquisition without sampling
  - e.g. evaluation of aerial photographs, file research, interviewing eye witnesses, in situ inspection
- Documentation based on expert surveys and database of inherited burdens

Results

- Itemisation of sites suspected of having inherited burdens
- Evaluation according to suspicion categories – low/medium/strong
Stage IIa  Orientational Examination

Project Targets

- Examination of sites suspected of having inherited burdens to establish and assess extent of contamination (BBodSchV Section 3, Subs. 3)
- Examination of assumed of inherited burdens resulting from the historic investigation
- Settling of assumed of inherited burdens: unrestricted land use or
- Statement of reason for concrete indications / sufficient grounds for suspicion:
  selection of sites to undergo closer examination (as part of detailed examination)

Procedures

- Technical examinations, sampling, chemical analysis
- Research of supplementary location area
- Environmental risk assessment in terms of specific exposition and land use
- Documentation based on expert surveys and database

Results

- Evaluation according to action categories
- Cost assessment of any inherited burden remediation (min/risk-neutral/max)
- Strategic Action Concept
- Coordination of results with competent authority, aimed at:
  - exclusion of out supplementary investigations
  - regulation of supplementary measures
Stage IIa Detailed Examination

Project Targets

- Examination of sites suspected of having inherited burdens to establish whether pollutant concentration in some restricted areas poses risks (BBodSchV Section 3, Subs. 4, 5 and 6)
- Examination of the contaminated site from the orientational examination
- Settling of contaminated site:
  - unrestricted land use or
- Establishment of inherited burden and need for supplementary action (in the course of the feasibility study)
  - final risk assessment

Procedures

- Supplementary technical examinations, taking samples, chemical analytics
- Environmental risk assessment in terms of specific exposition and land use
- Documentation based on expert surveys and database

Results

- Evaluation according to action categories
- Itemisation of contaminated sites (according to media)
- Cost assessment of any inherited burden remediation (min/risk-neutral/max)
- Updating Strategic Action Concept, inter alia with Variant Decision Concept
- Coordination of results with competent authority, aimed at:
  - exclusion of supplementary investigative action
  - regulation provisional remediation targets
  - Regulation of fundamentally suitable remediation variants
**Stage IIb Feasibility Study**

*Remedial Investigation as defined in BBodSchV*

**Project Targets**
- Examination of contaminated sites to determine what action is required to achieve remediation (BBodSchV Section 6, Subs. 1)
- Draft planning for selected remediation procedures
- Examining feasibility in terms of compliance with provisional remediation targets
- Verifiable assessment of remediation costs

**Procedures**
- If applicable, technical (pilot) tests to dimension remediation facilities
- Documentation based on planning documents

**Results**
- Detailed cost assessment of remediation variants (min/risk-neutral/max)
- Updating Strategic Action Concept
- Updating Variant Decision Concept
- Coordinating results with the competent authority
  - If necessary, modification of previous remediation targets
  - Stipulating the preferred remediation variant (Action Concept)
Stage IIb  
Approval Planning  
Remedial Planning as defined in BBodSchV

Project Targets
- Presentation and proof that the measures proposed for the contaminated sites are suitable for avoiding hazards over the long term (BBodSchV Section 6, Subs. 2)
- Presentation of the preferred remediation variant in a manner suitable for approval
- Derivation of criteria for monitoring success and discontinuation of remediation
- Public contract to minimise risk

Procedures
- Documentation on the basis of detailed planning documents
- Preparation of applications for approval
- Consultation of any third parties involved

Results
- If necessary, specific cost assessment for remediation variants (min/risk-neutral/max)
- Updating Strategic Action Concept
- Updating Variant Decision Concept
- Coordinating results with the competent authority
  - Statement of binding character of remediation plan within the scope of the public contract
  - Stipulation of binding remediation targets and criteria for discontinuation
  - Releasing DB AG from further measures
- Basis for execution planning
Stage III  Remediation Execution

Project Targets

- Execution of rehabilitation measures pursuant to BBodSchV Section 2, Subs. 7, on contaminated sites to ensure that no long-term hazards are created pursuant to BBodSchV Section 4, Subs. 3
- Fair, objective and efficient execution of measures
- Removal of sites from cadastral register of inherited burdens

Procedures

- Invitations to tender and contract award for execution planning
- Documentation of action and success monitoring
- Coordinating results with the competent authority
  - Confirmation of conclusion of rehabilitation

Results

- Conclusion of treatment of inherited burden
New Central Station
Berlin Lehrter Bahnhof
New Central Station Berlin Lehrter Bahnhof
Demolition projects at DB AG

Example: Stuttgart 21 (area C1)

Occasion: sale of estate as part of financing *Project* Stuttgart 21 (purchaser: city of Stuttgart, 133,000 m²)

Object of clearance: former Northern Station

Main contract Arrangements:
- complete clearance of the area including foundations by DB AG
- soil waste belongs to purchaser
- all hazardous waste sites belong to purchaser

Status: demolition delayed by purchaser because of potential self-interest of part of the existing buildings
Demolition projects at DB AG
example Stuttgart 21
(area C1)

- warehouses
- traffic areas and stocking grounds
- office buildings
- railway tracks
Demolition projects at DB AG - example Stuttgart 21 (area C1)
technical preparation of dismantling

- search of documents (maps of former buildings, pipe maps)
  --> residues of foundations, sewer systems, tanks or other facilities in the underground
  (e.g. inspection pits)

- sampling of the different building materials
  --> degree of contamination, health and safety measures

- evaluation of situation of subsurface contamination
  --> excavated material, sealing, remedial design

⇒ dismantling concept including evaluation of material and specifications to demolition techniques
   and waste disposal

⇒ health and safety concept (personal safeguarding measures, material handling, timetable)

basis for calculation of costs and call for tenders
Demolition projects at DB AG - example Stuttgart 21 (area C1) special problems due to railway-specific facts

- different responsibilities inside the DB AG
  - Railway systems
  - Buildings
  - Sewer system + cables
  - Waste / hazardous waste
  - etc.....
  - Tenants

- competence of various licensing authorities
  - EBA (Federal Railway Office)
  - Building Authority
    - Public Works Service
    - Nature Protection Agency
    - Survey Office
    - Monument Protection Agency
    - Environmental Protection Agency
Demolition projects at DB AG - example Stuttgart 21 (area C1)
special problems - contract-specific problems

<table>
<thead>
<tr>
<th></th>
<th>contract</th>
<th>authority requirements</th>
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</thead>
<tbody>
<tr>
<td>• sewer system</td>
<td>cut and seal</td>
<td>complete demolition / concrete filling</td>
</tr>
<tr>
<td>• hazardous waste sites</td>
<td>sold to city</td>
<td>underground investigation during demolition</td>
</tr>
<tr>
<td>• sealing</td>
<td>complete demolition</td>
<td>safe capping in areas with soil contamination</td>
</tr>
<tr>
<td>• waste disposal</td>
<td>sold to city</td>
<td>disposal when moved</td>
</tr>
<tr>
<td>• backfilling of building pit</td>
<td>demolition waste &lt; Z1.1 clayey material</td>
<td></td>
</tr>
</tbody>
</table>
Demolition projects at DB AG - example Stuttgart 21 (area C1) consequences

- significant effort of organisation for
  - different arrangements
  - parties of interest
  - timetables

- high costs resulting from
  - increased expert investigation
  - non-calculated efforts
  - organisation
Demolition projects at DB AG – example Stuttgart 21 (area C1)
Karlsruhe City Park
Karlsruhe City Park

Railway Maintenance / Repair Facility

- repairing locomotives
- repairing passenger carriages
- routine inspections
- paint shops
- corrosion prevention
- storages
HISTORY

Railway Maintenance / Repair Facility
Karlsruhe-Hbf

- 1863: start of operation
- 1940s: ~ 5000 workers employed
- 1450: complete destruction in WW II
- 1970s: decision of closing facility
- 1998: end of operation

135 years of industrial development
URBAN DEVELOPMENT

of a former railway estate

- 350,000 m² industrial property
- located at the margin of downtown area
- intention of owner to sell property
- need of owner for high sale profits
- intention of community to built a new town district
- need of community for residential- / commercial areas

-Cooperation between:
  Deutsche Bahn AG
  Dept. of Karlsruhe town planning
RESPONSIBILITIES
in development process

Deutsche Bahn AG

- environmental investigation
- clean-up / site remediation
- marketing
- preparing construction site

City of Karlsruhe

- authorization process
- coordination of planning
- providing infrastructure
Karlsruhe City Park
Development project “port of Mainz“
Development project “port of Mainz“

Special problems in project handling due to technical / geological facts

- wide spreaded contaminations
- Gasworks in neighbourhood contamination by groundwater inflow
- hydrocarbons in groundwater, source unknown

Special problems in project handling due to authority restrictions, decisions

- Despite extensive assessment / sampling additional requirements by authority
- Despite zero leaching results, Authority assumes hazards for groundwater
- Pre-remediation and additional assessment and sampling required by authority
Development project “port of Mainz“
Development project “port of Mainz“
Stuttgart Bad Canstatt DaimlerChrysler plant
Stuttgart Bad Canstatt DaimlerChrysler plant
Stuttgart Bad Canstatt DaimlerChrysler plant
Stuttgart Bad Canstatt DaimlerChrysler plant
Stuttgart Bad Canstatt DaimlerChrysler plant
Conclusion

- create an overall strategy for the site and the area specially the town or state planning strategy
- build up own knowledge in your organisation for brownfield recycling
- transfer the idea that brownfield is change management and not only risk management
- approach all groups in your strategy and form a platform for the project development
- complete knowledge on the on-site situation should be the basis of profitable development

Thank you