KBS-3H
- Development of the Horizontal Disposal Concept

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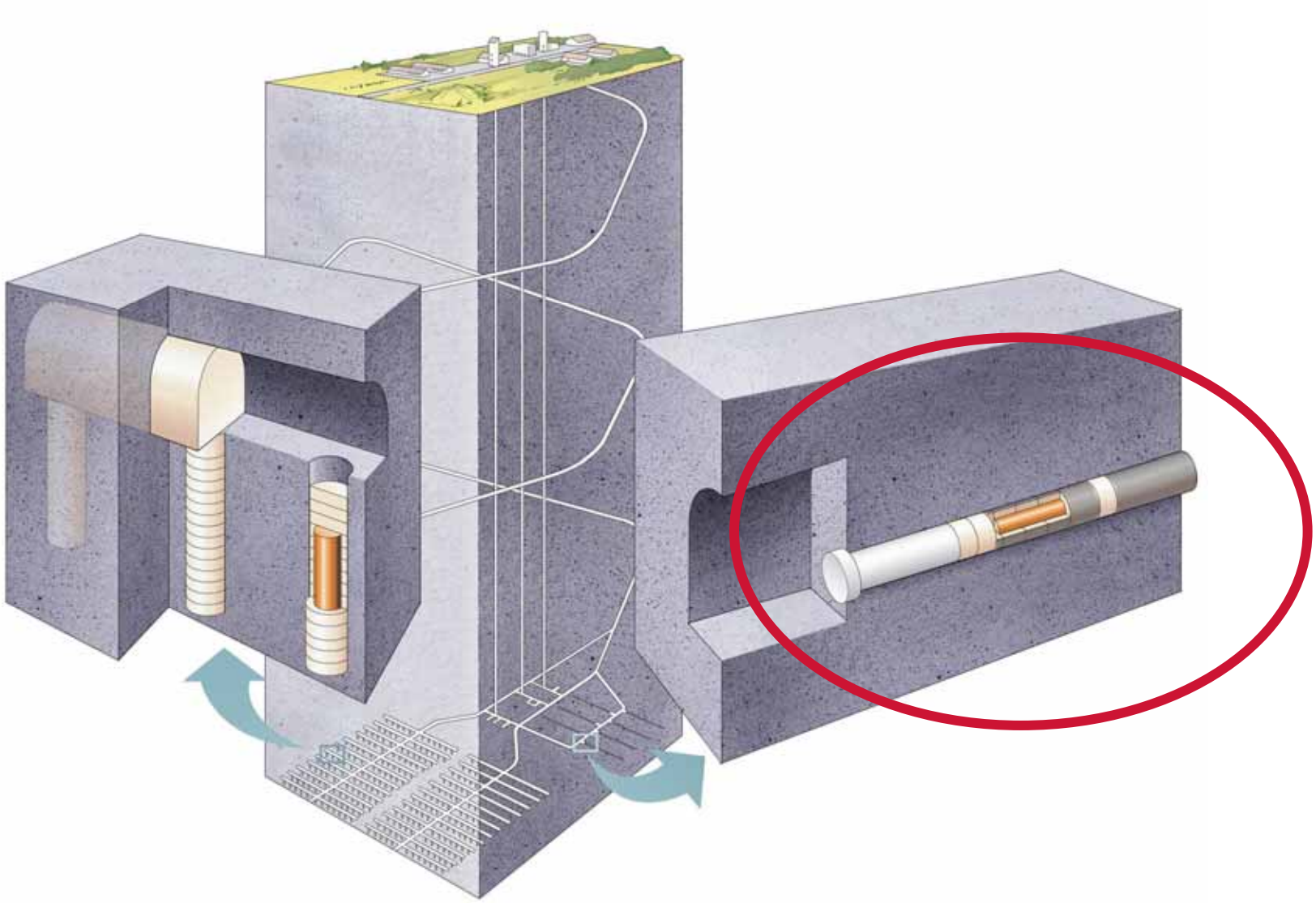
ESDRED, an EC project within the ongoing 6th R&D program: Engineering Studies and Demonstration of Repository Designs

Horizontal emplacement, KBS-3H



Motives for the KBS-3H concept

- KBS-3H **is estimated** to be a more efficient disposal method compared to KBS-3V
  - Reduction in rock excavation and backfilling
  - Less environmental impact during construction
  - Reduced costs
  - Reduced disturbance on the rock mass during construction and operation

- Quality aspects
  - Prefabricated disposal container enables an easier quality assurance of the canister near zone

Key issues of the KBS-3H project

- Method for excavating the deposition drifts
- Methods for handling of ground water inflow into the drift
- Method for handling of super container in the drift
- Design of the bentonite buffer and the impact of groundwater inflow
- Consequences of the super container and other steel components
- Method for sealing the drift with an end plug
- Long term safety - Does KBS-3H fulfill the requirements with respect to long term safety?

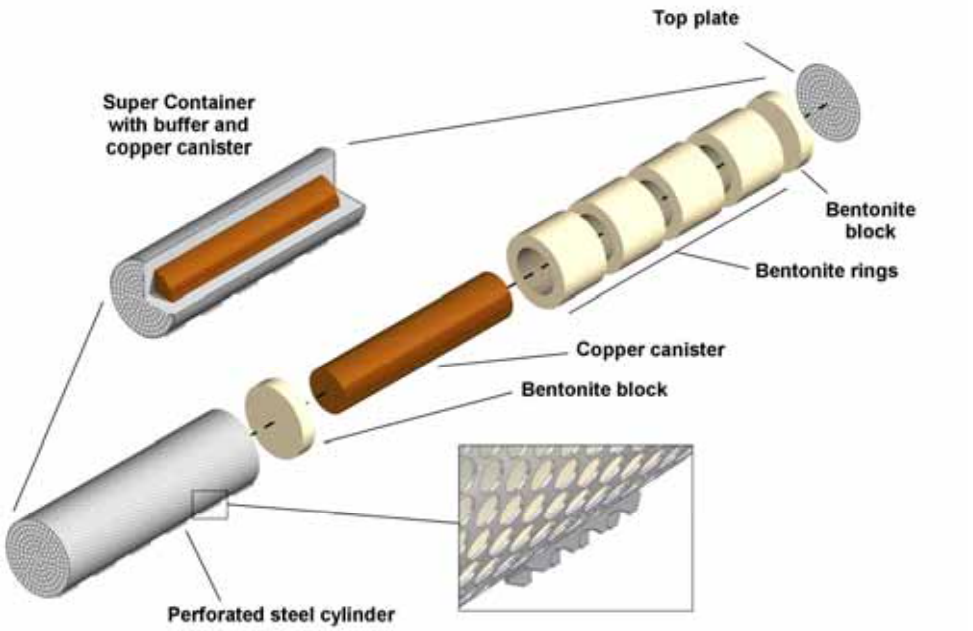
Main steps

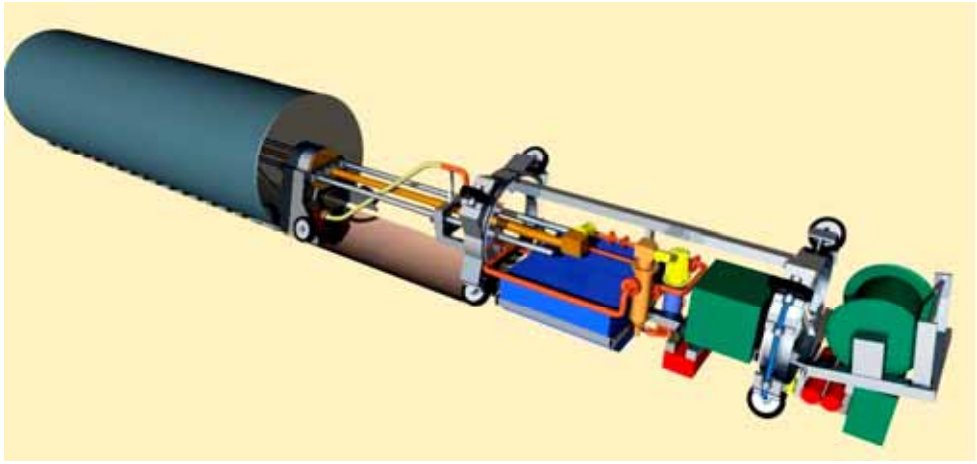
- 2002 **Feasibility study of the concept**
- 2003 **Basic design**
- 2004-2005 **Technical development**
- 2006-2007 **Demonstration and testing**
- 2007 **Evaluation and reporting**

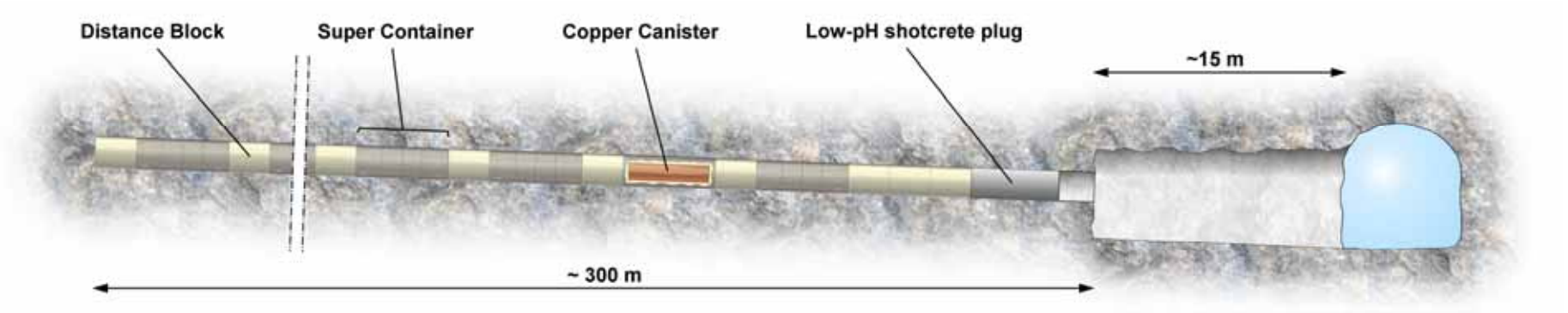
Decision – Continuation of the project

- 2008- Programme under discussion

Key components in the KBS-3H concept







The KBS-3H concept

Unfortuantely the animation
is not available

Main objectives of the R&D studies

1. Repository layout and geological adaptation
2. Long-term safety
3. Demonstration and testing of the deposition equipment and drift components

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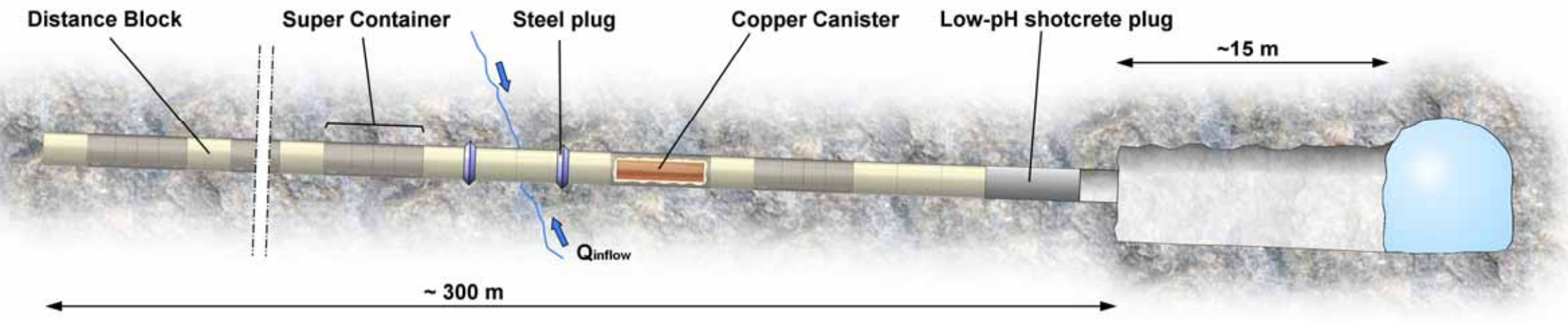
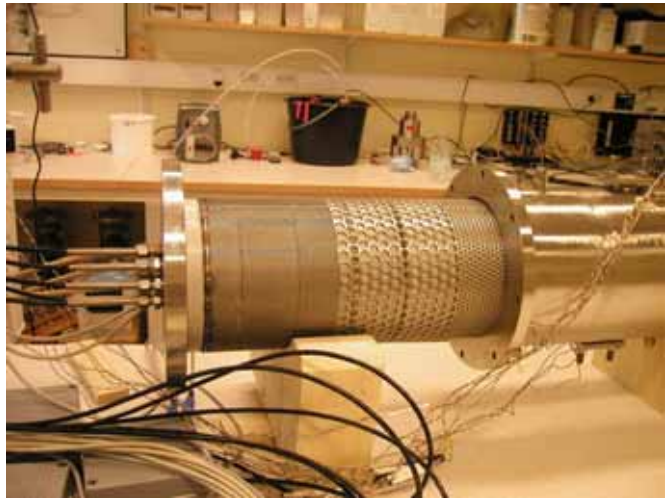
Repository layout of the KBS-3H concept

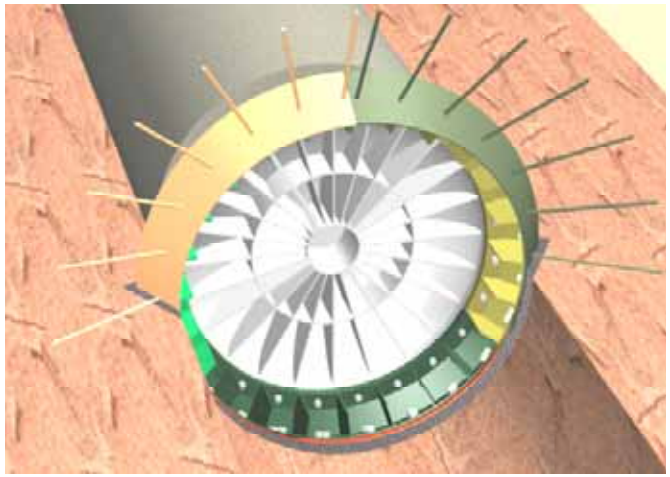


- About 30 super containers in a 300 m long drift
- Utilization degree depending on water inflow, bedrock conditions, etc
- Layout adaptation of the concept to Olkiluoto site

Evaluation of drift components:

- Buffer and early evolution:
  - Bentonite studies
  - Design of distance block
- Ground water inflow:
  - Reduce water inflow by different methods





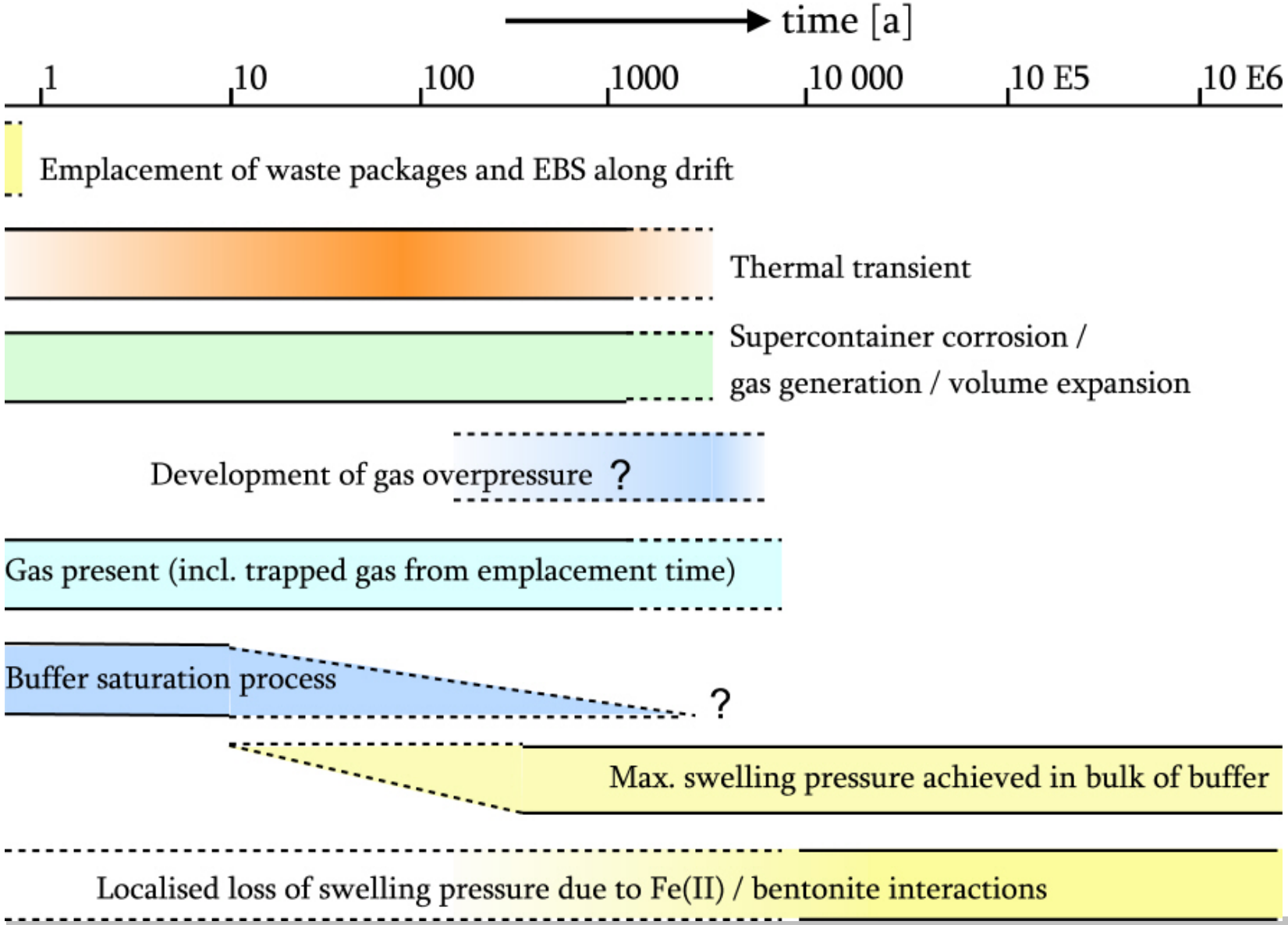
Main objectives of the R&D studies

1. Repository layout and geological adaptation
2. **Long-term safety**
3. Demonstration and testing of the deposition equipment and drift components

Long-term safety

- Description of processes of importance in the 3H concept and analyses of the processes
- Description of the evolution of the 3H system. Interaction with Design and Demonstration to evaluate and resolve critical issues related to the early evolution.
- Perform radionuclide transport analyses
- Iron-bentonite interaction studies
- Preliminary Safety Case based on Olkiluoto site

Processes and aspects of system evolution for 3H



Main objectives of the R&D studies

1. Repository layout and geological adaptation
2. Long-term safety
3. **Demonstration and testing of the deposition equipment and drift components**

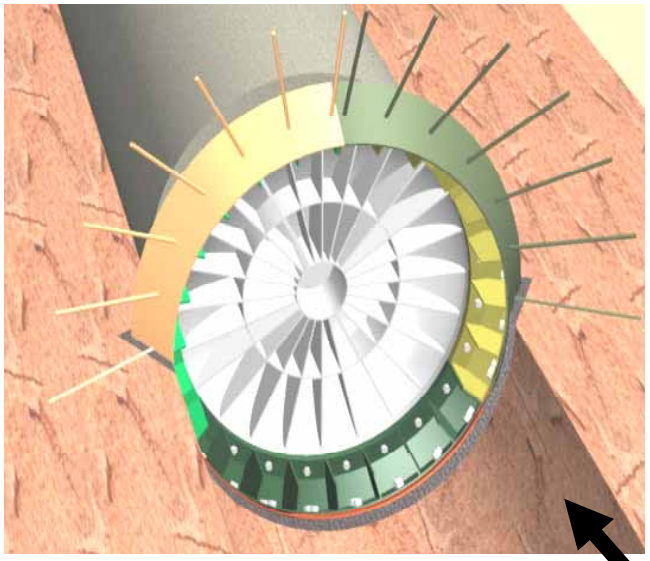
KBS-3H Demonstration at Äspö HRL

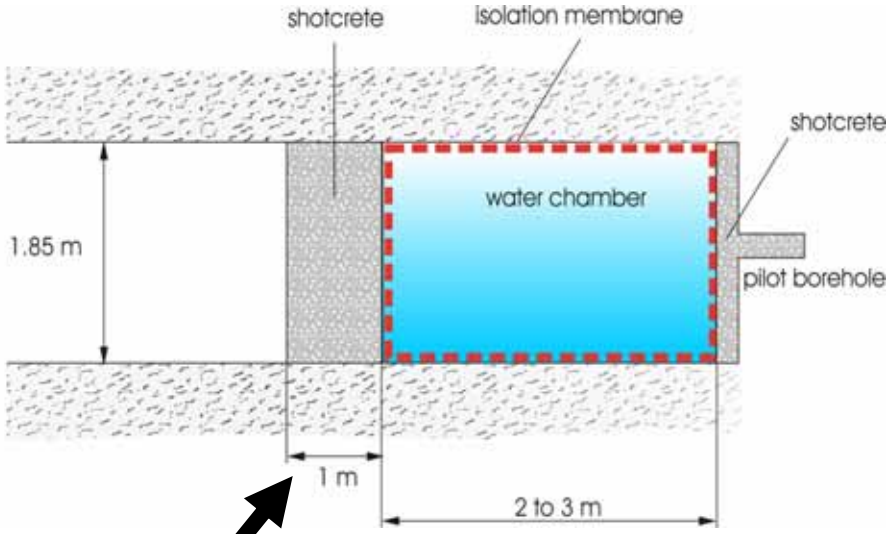
- Excavation of two drifts (February 2005)
- Test of the Deposition Equipment
- Full scale tests of drift components

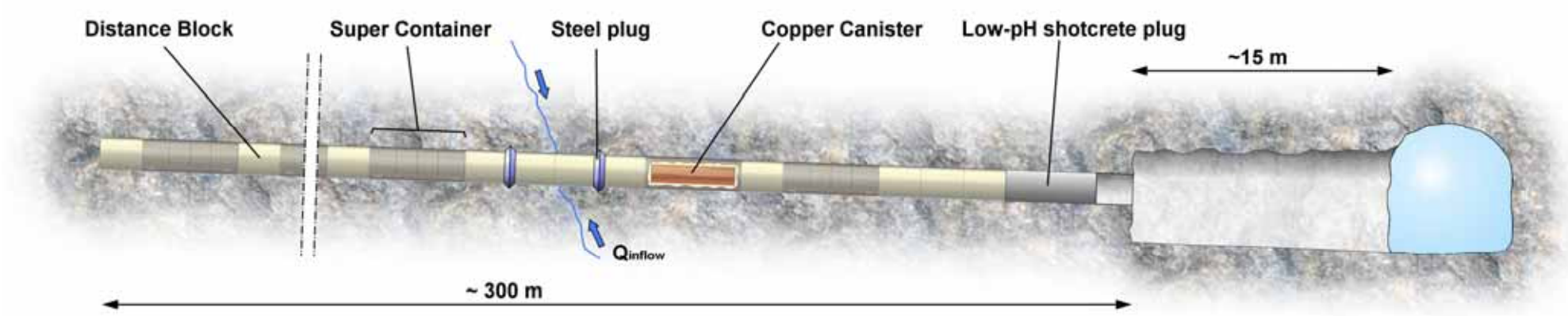
The deposition equipment

- Manufacturing is performed at CNIM in France
- SAT planned in September 2006
- Testing and demonstration of the equipment will be ongoing appr.10 months
- Evaluation and reporting up to autumn 2007

Test of drift components

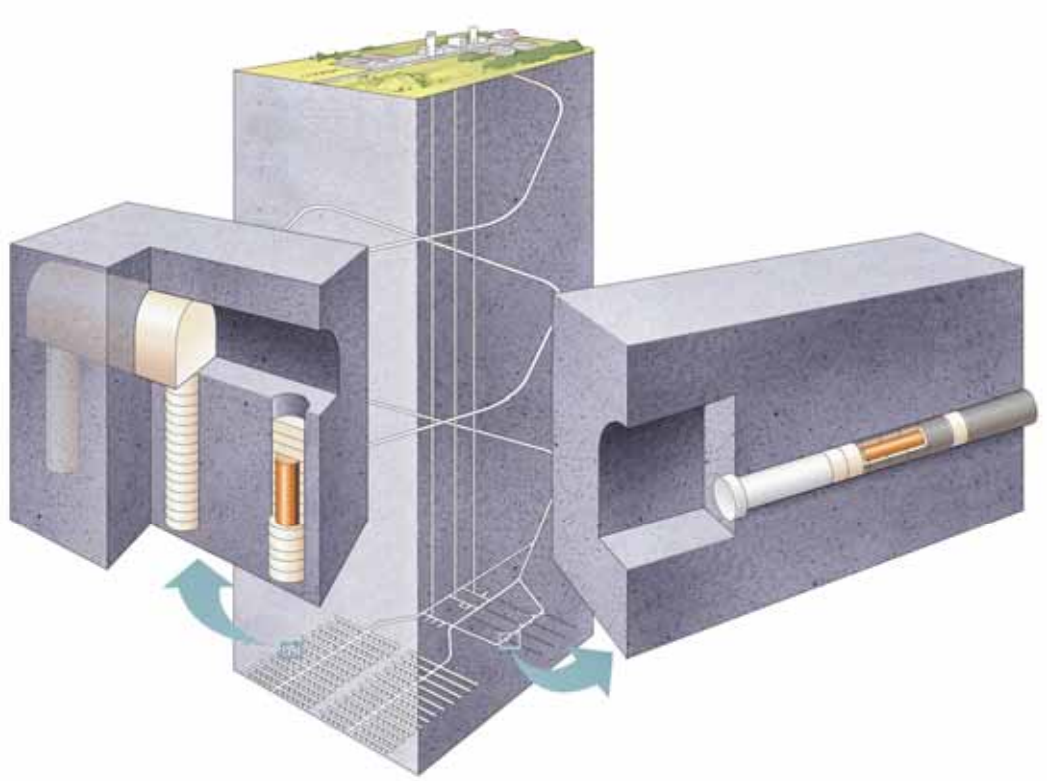






Conclusions

- **Important phase**
  - Main activities are well advanced or completed
  - Some issues have still to be solved
  - Demonstration and testing
  - Evaluation and reporting



- **KBS-3H feasible alternative to 3V concept?**
  - Stepwise approach
  - Planning of further development work

End of presentation!

Questions?