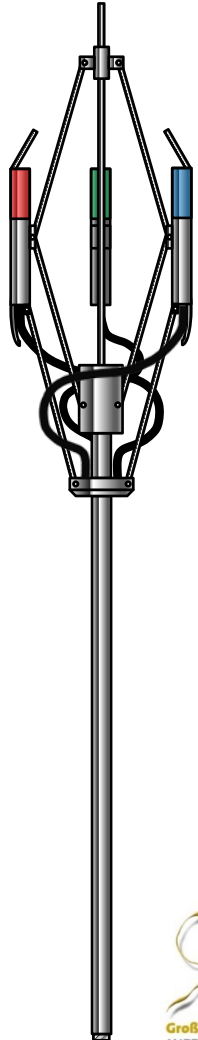


Well logging in cased wells – detection of annular space filling



Dr.-Ing. Gunther Baumann
Bohrlochmessung - Storkow GmbH
Schützenstraße 33
15859 Storkow
g.baumann@blm-storkow.de



Bohrlochmessung-Storkow GmbH

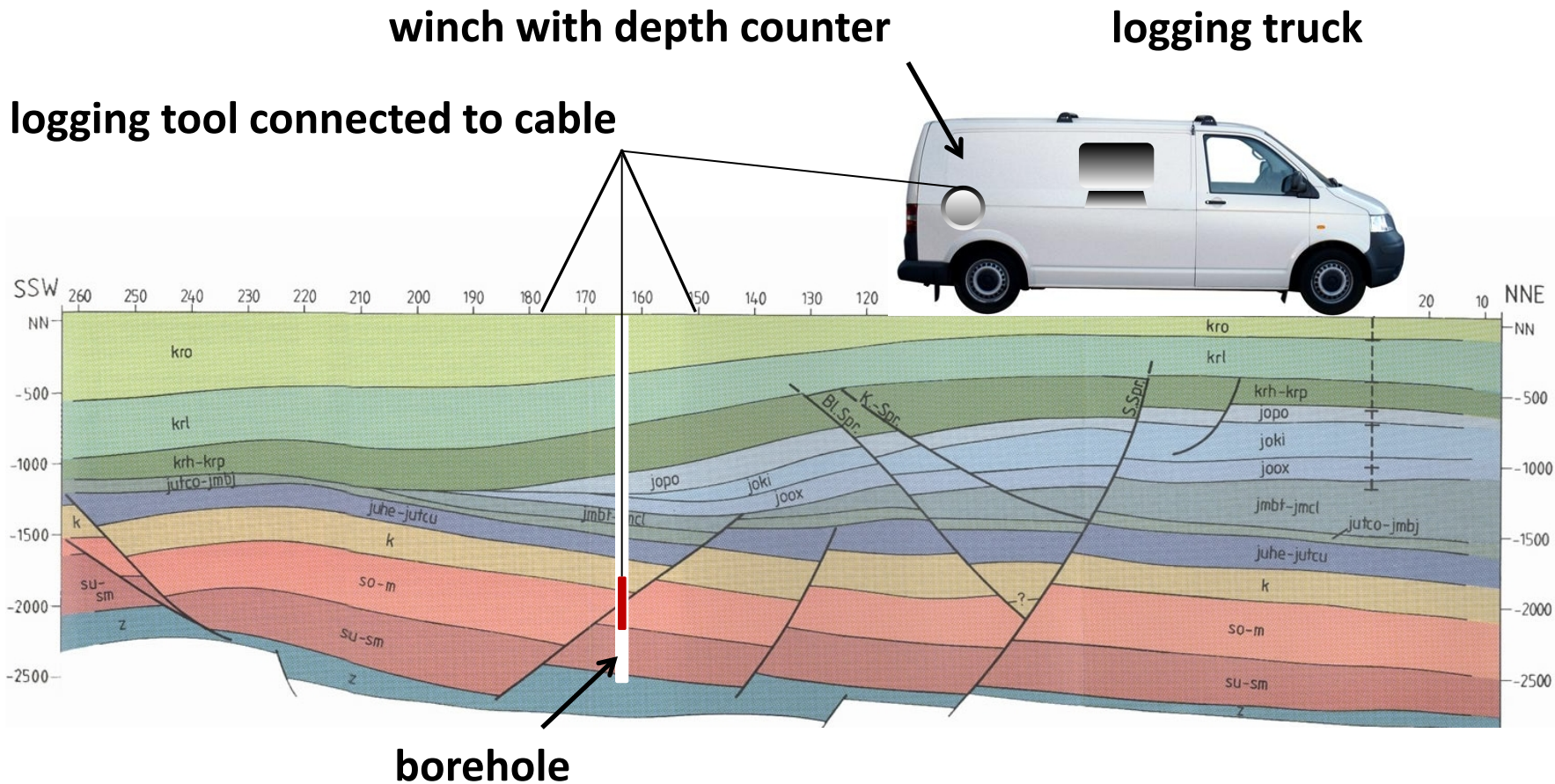
- **Founded** in **1961**, located SE of Berlin
- **Archives inventory** of approximately 150,000 measured wells
- **30 employees** (geologists, geophysicists, technicians)
- **10 logging trucks** for various well logging applications



Business and activities

- **Water exploration and exploitation** (drinking water and production water wells)
- **Mining** (lignite, coal, copper, salt)
- **Geotechnics** (mining, foundation of bridges, wind mills, buildings,...)
- **Environmental protection** (waste dumps, old industrial complexes, military facilities)

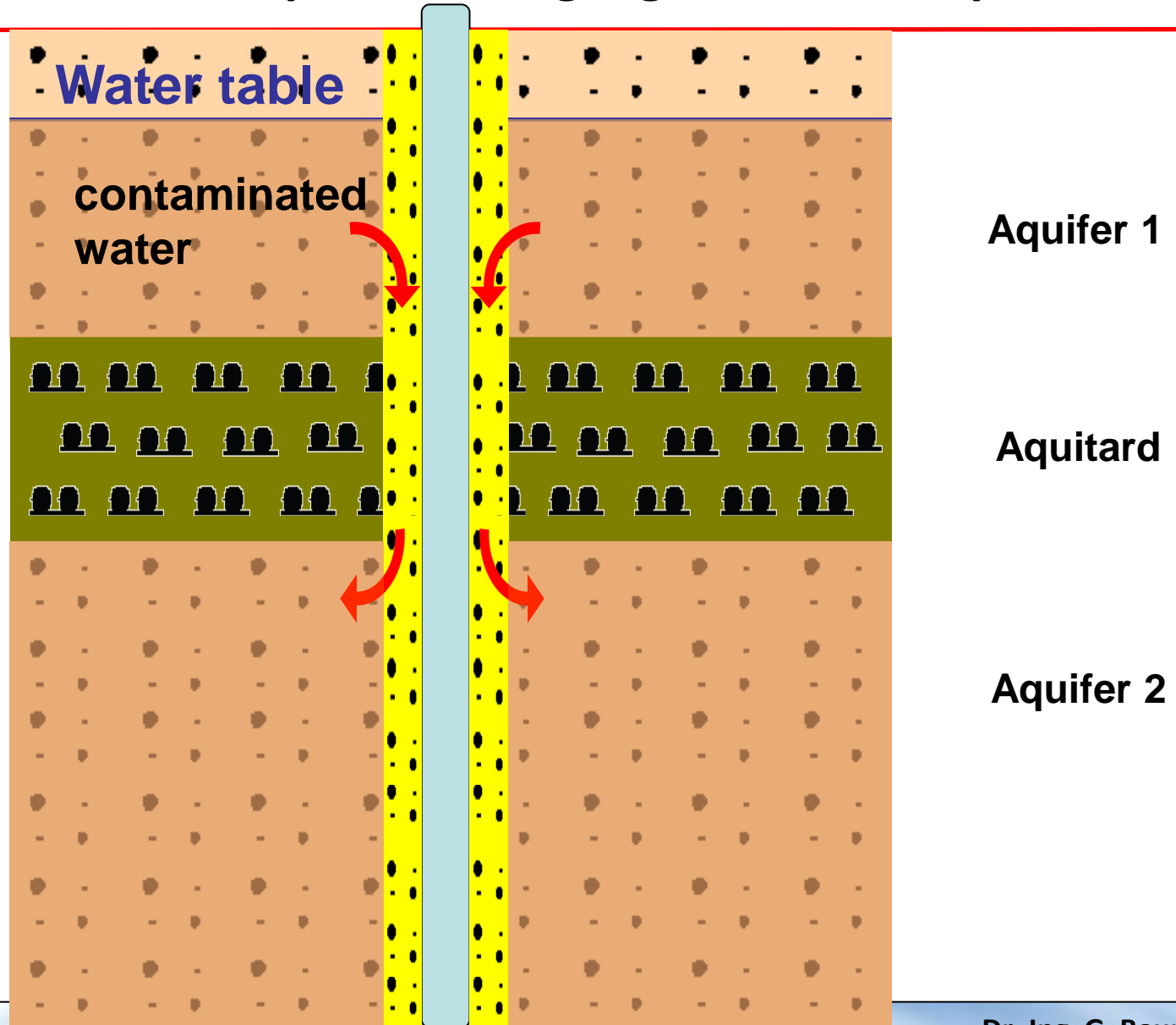
Pinciple of geophysical logging



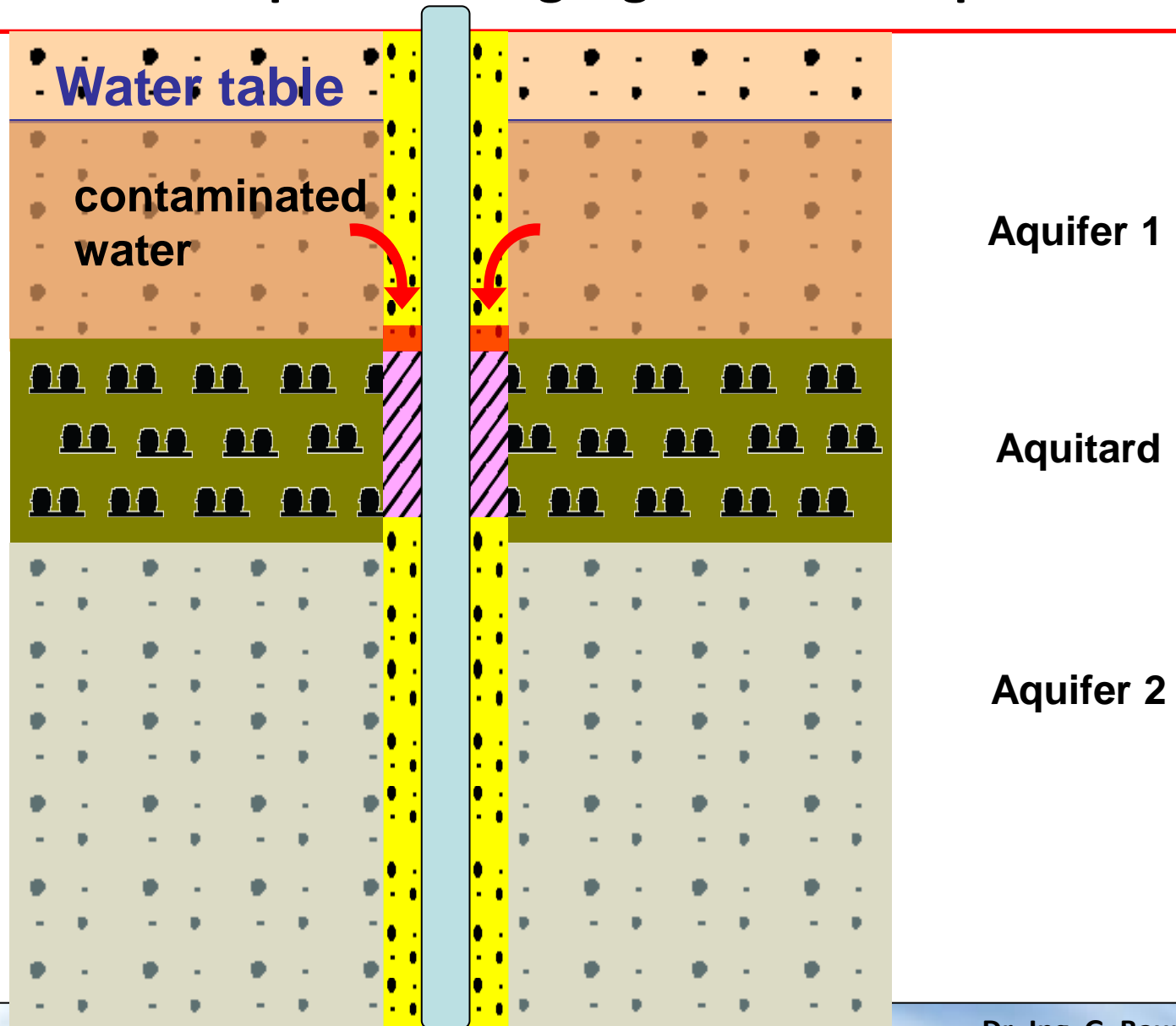
Logging trucks in different locations



Function of the annular space sealing – groundwater protection

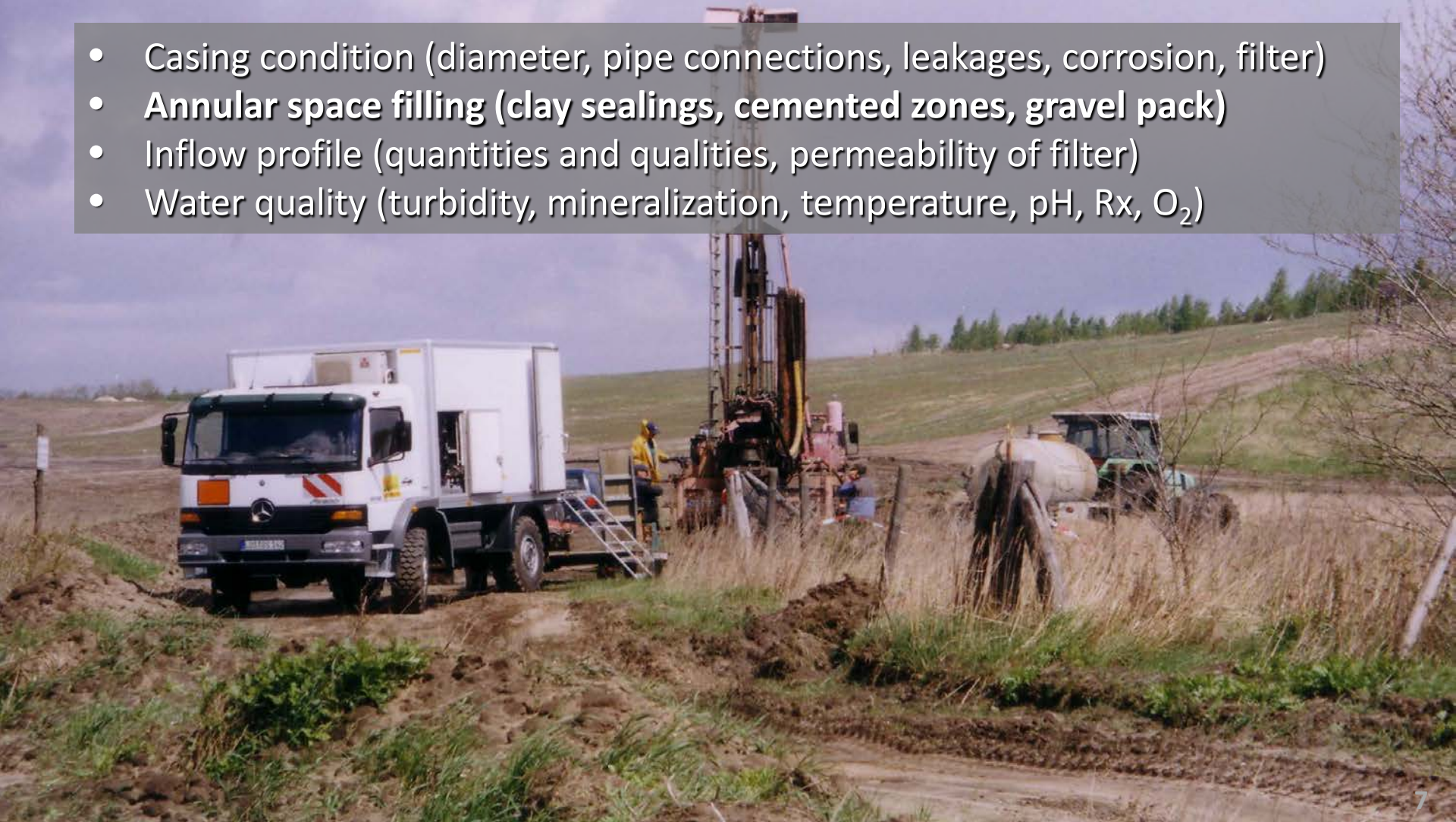


Function of the annular space sealing – groundwater protection



Well logging in cased wells

- Casing condition (diameter, pipe connections, leakages, corrosion, filter)
- **Annular space filling (clay sealings, cemented zones, gravel pack)**
- Inflow profile (quantities and qualities, permeability of filter)
- Water quality (turbidity, mineralization, temperature, pH, Rx, O₂)



Combination of measuring methods for the verification of annular space seals

Clay or Clay-Cement-Suspension	necessary measuring methods for verification	
	One-dimensional	Three-dimensional
Not endowed	GR, GG.D, NN	SGL, RGG.D, NN
Gamma-activ endowed	GR, GG.D, NN	SGL, RGG.D, NN
magnetic endowed	MAL, GG.D, NN	MAL, RGG.D, NN

GR Gamma-Ray-Log
 SGL Segmented Gamma-Ray-Log
 GG.D Gamma-Gamma-Density-Log
 RGG.D Rotating-Gamma-Gamma-Density-Log
 NN Neutron-Neutron-Log
 MAL Magnetic-Susceptibility-Log

Measuring program recommendation according to DVGW W 110

Annular Space Filling

Task

Annular Space Filling
Position of Clay Sealings, Filling Gaps,
Density/Porosity of Gravel Pack

Used logging methods

Segmented-Gamma-Ray-Log (SGL)
Gamma-Gamma-Density-Log (GG.D)
Neutron-Neutron-Log (NN)
Magnetic-Susceptibility-Log (MAL)
Annular-Space-Density-Scanner (RGG.D)

SGL

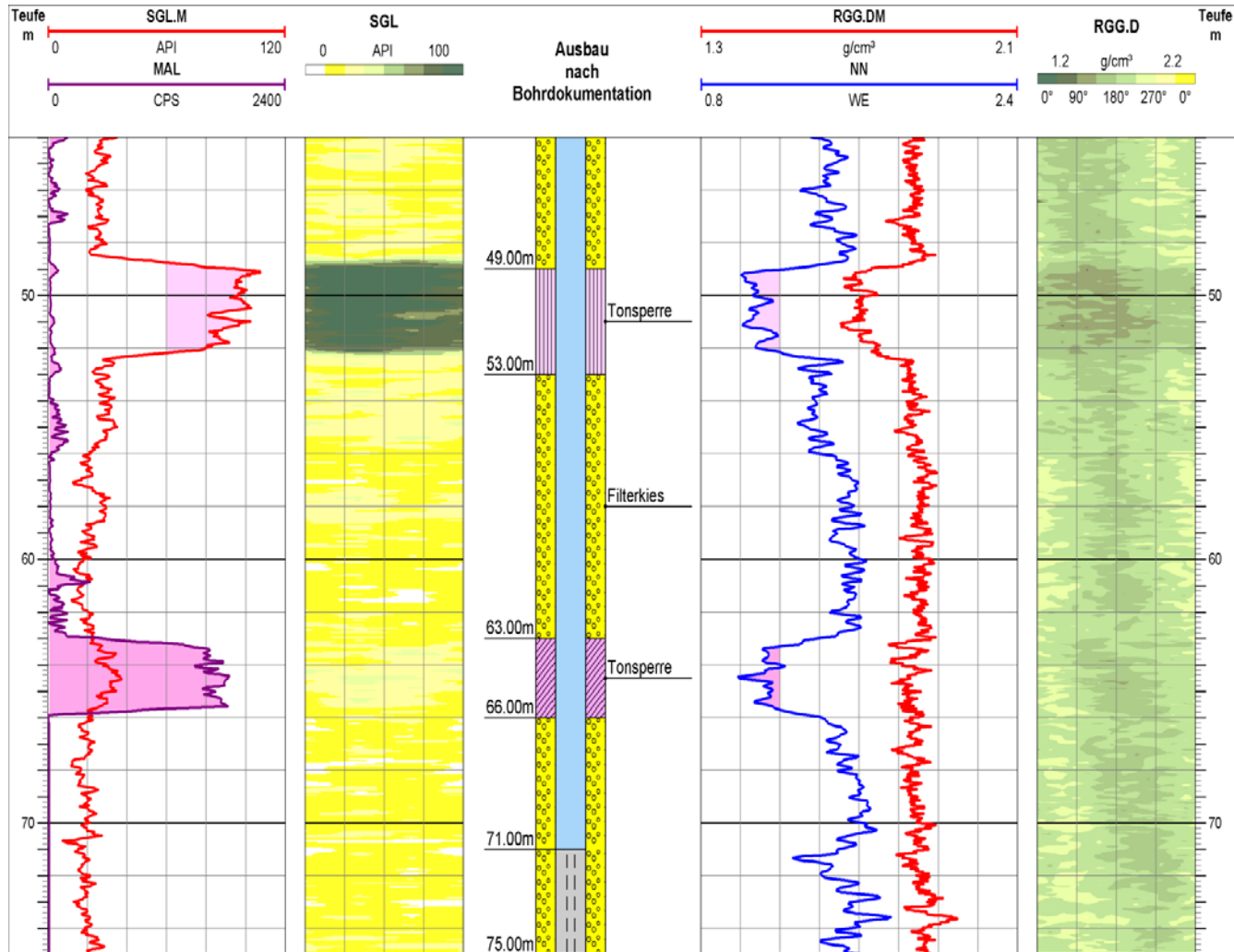
GG.D

NN

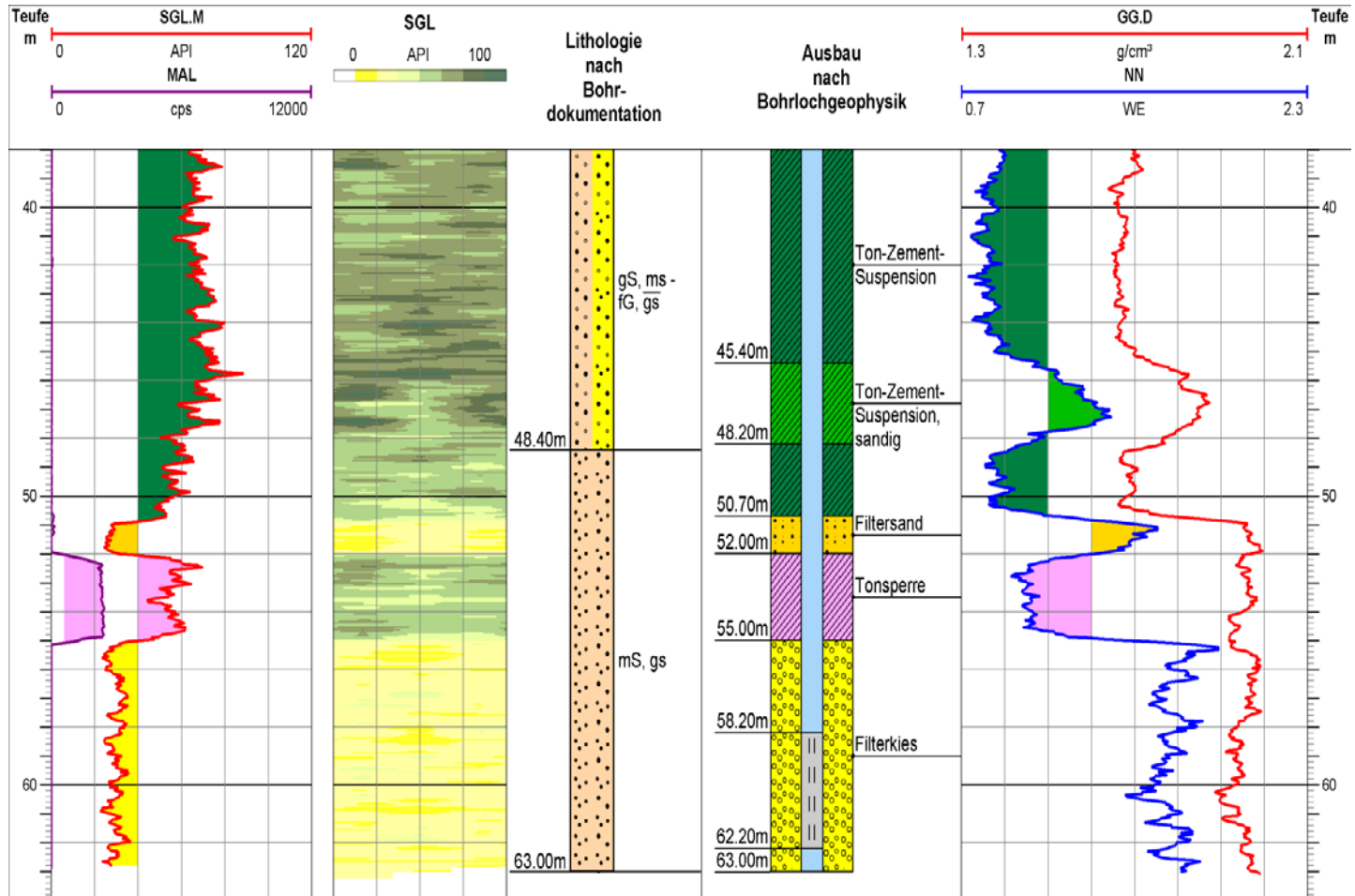
MAL

RGG.D

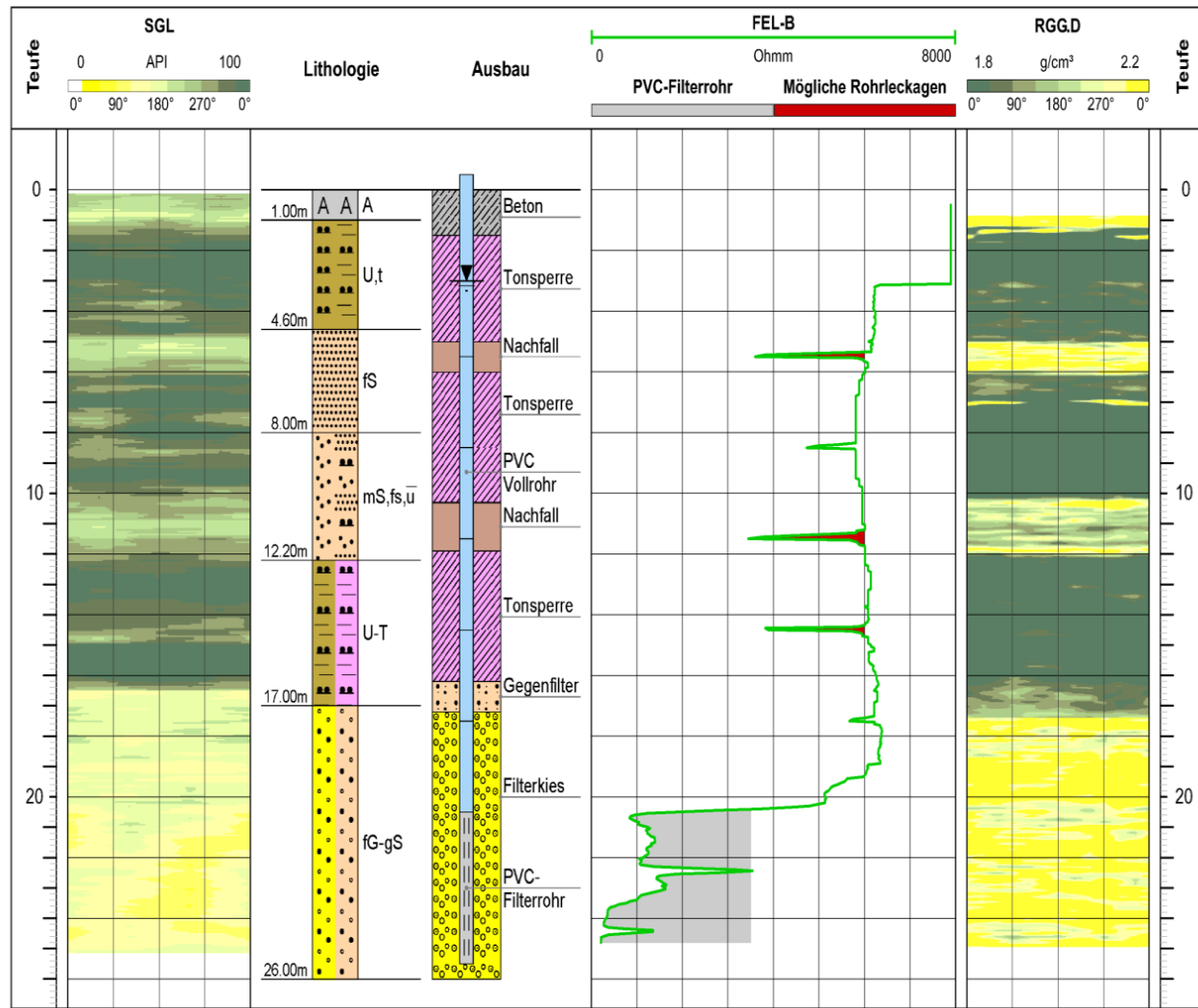
Clear detection of clay seals



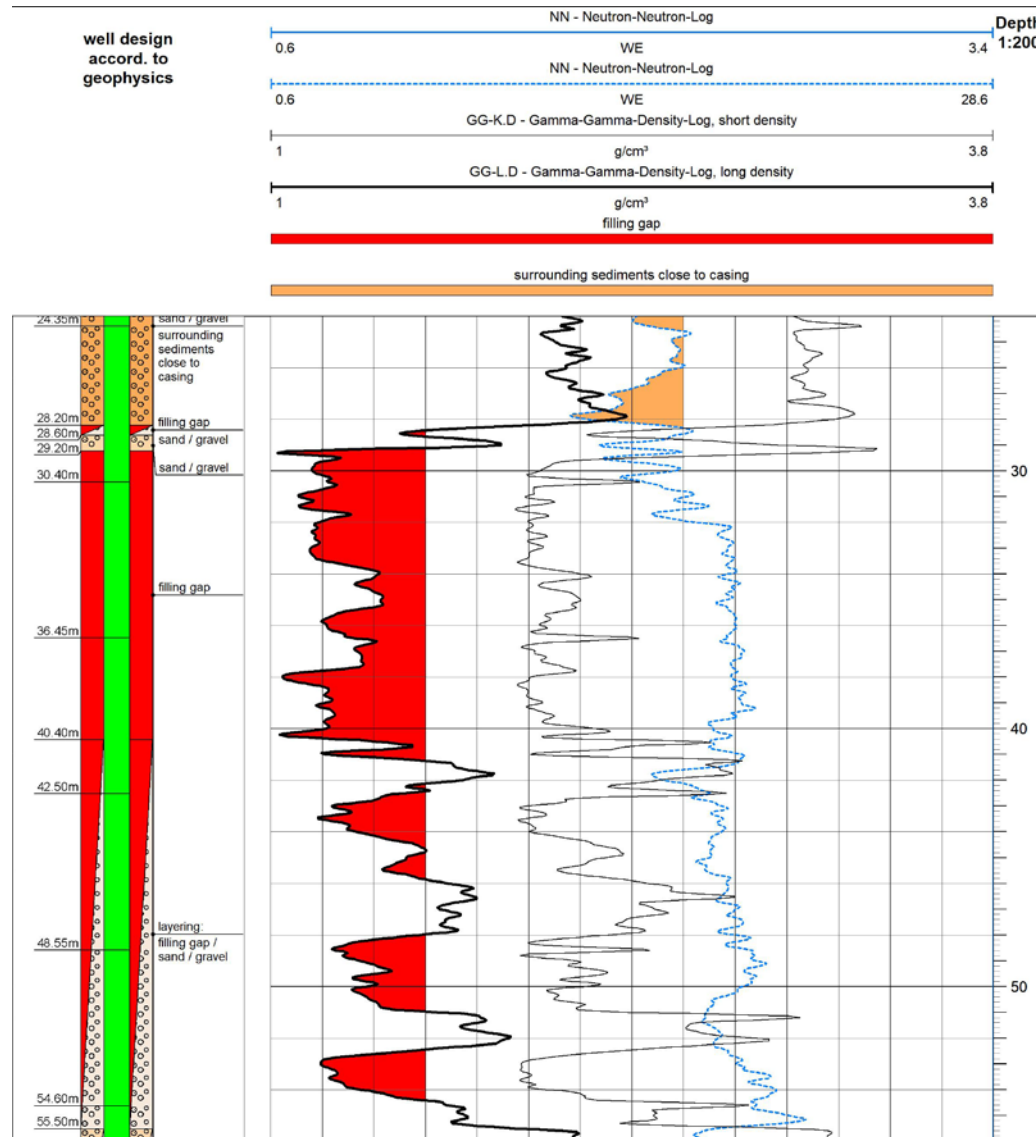
Clear detection of clay-cement seals



Filling gaps in the annular space



Annular Space Filling – Density log shows significant filling gaps



Thanks for your
attention!

