



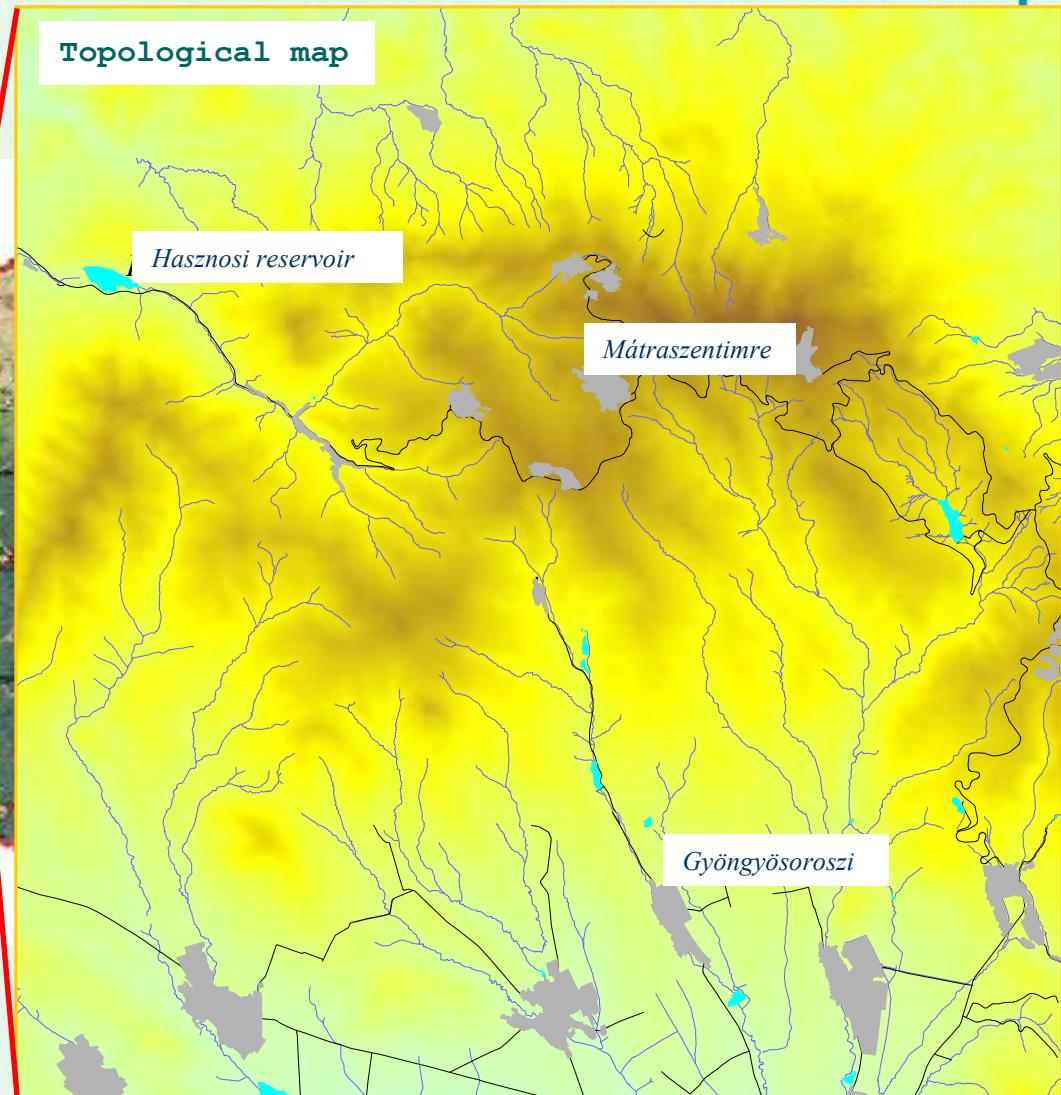
*Complete Closure and
Remediation of the
Gyöngyösoroszi Lead-Zinc
Mine*

8th July 2005

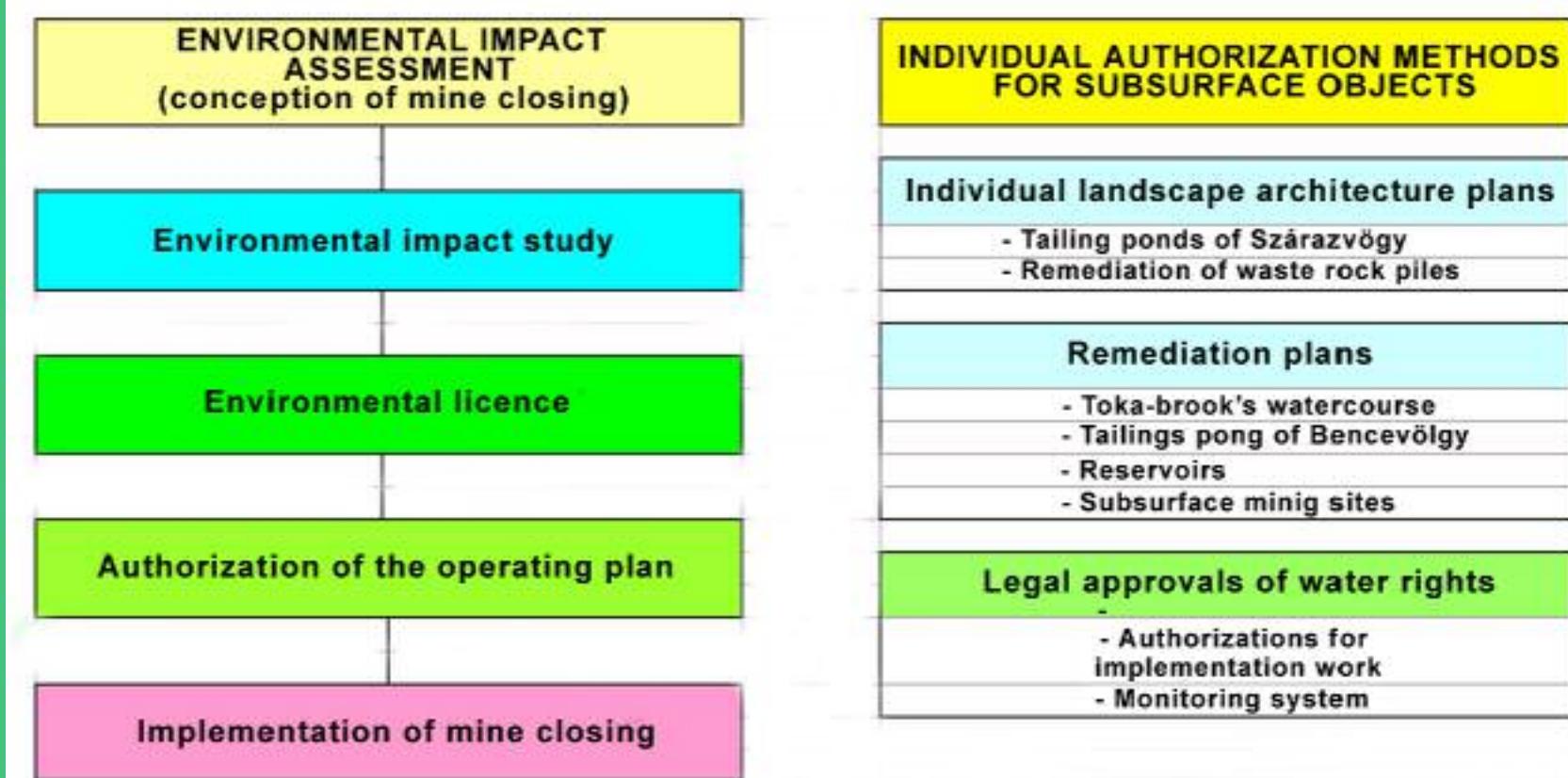




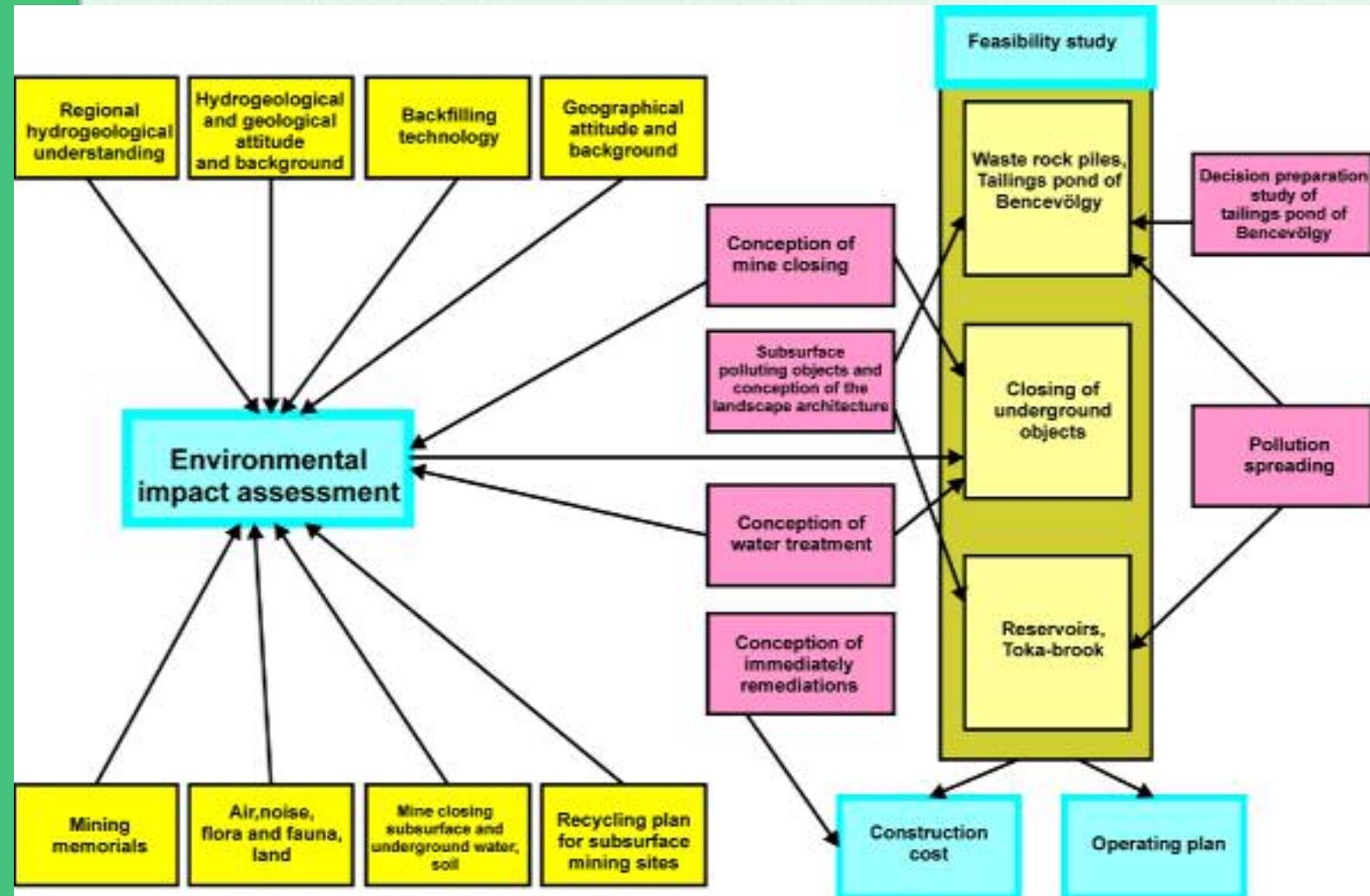
Gyöngyösoroszi's attitude in Hungary



Complete Remediation of the Gyöngyösoroszi Ore Mining

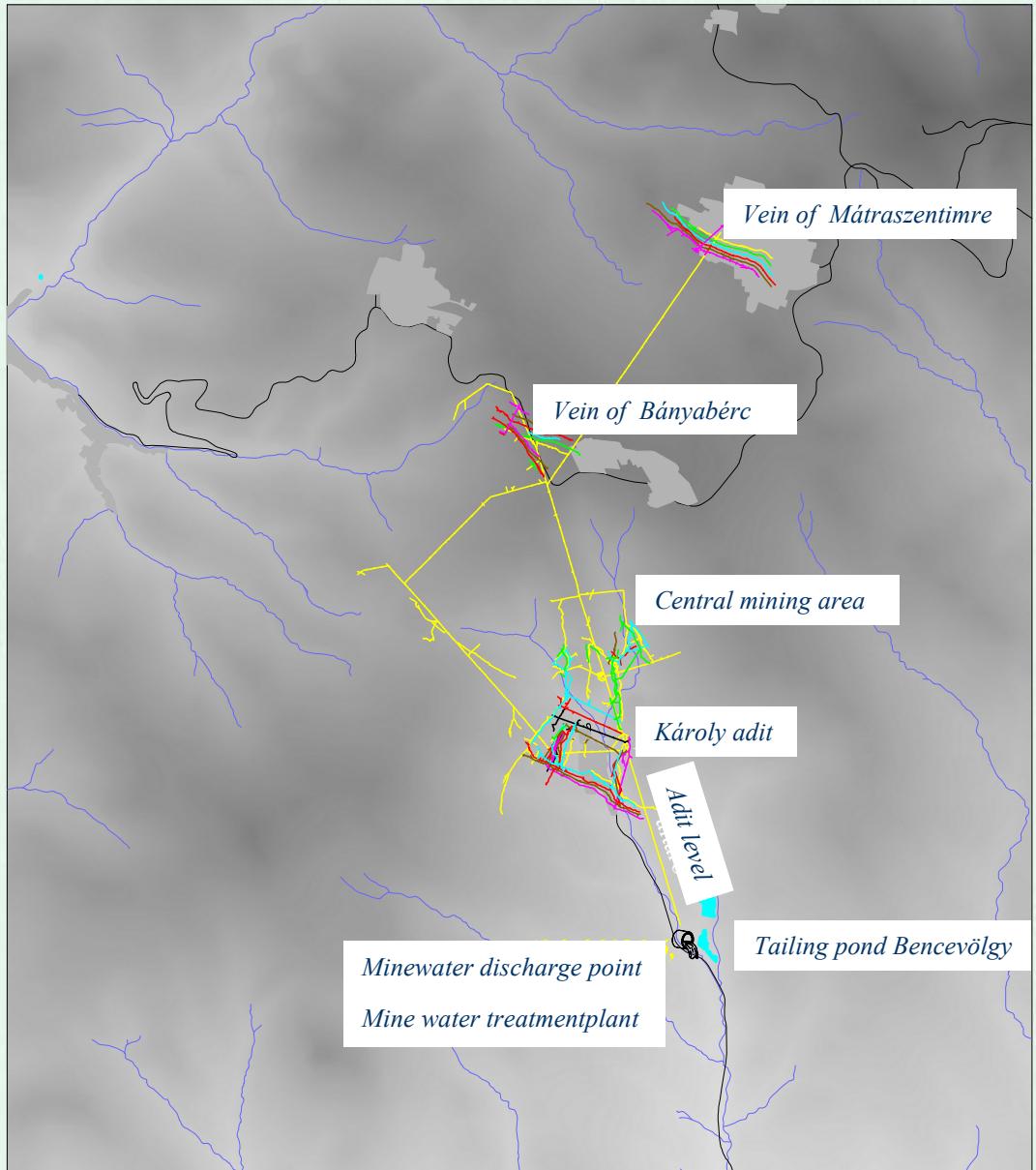


Realization chart of the complete remediation project





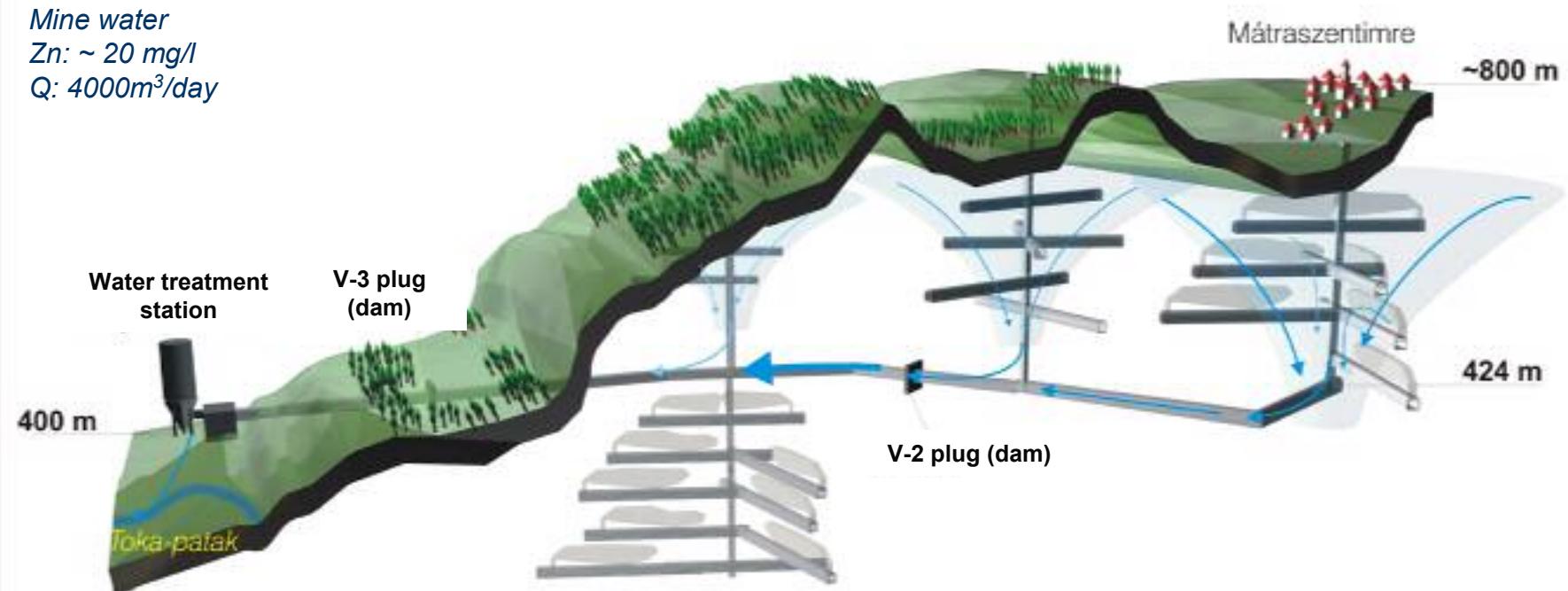
Main objects of the mine



Conception of the mine closing

Recent state

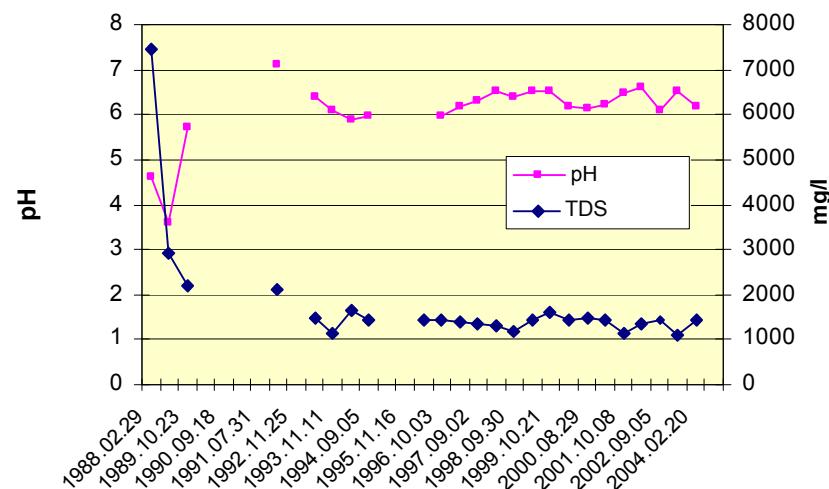
Mine water
Zn: ~ 20 mg/l
Q: 4000m³/day



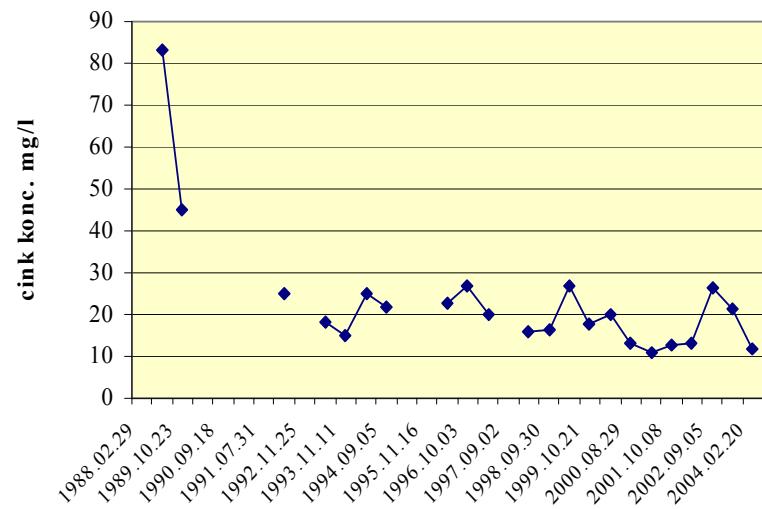
Conception of the mine closing

Hazard of the recent state

pH and TDS of the mine water between 1988-2004



Zn concentration in mine water at discharge





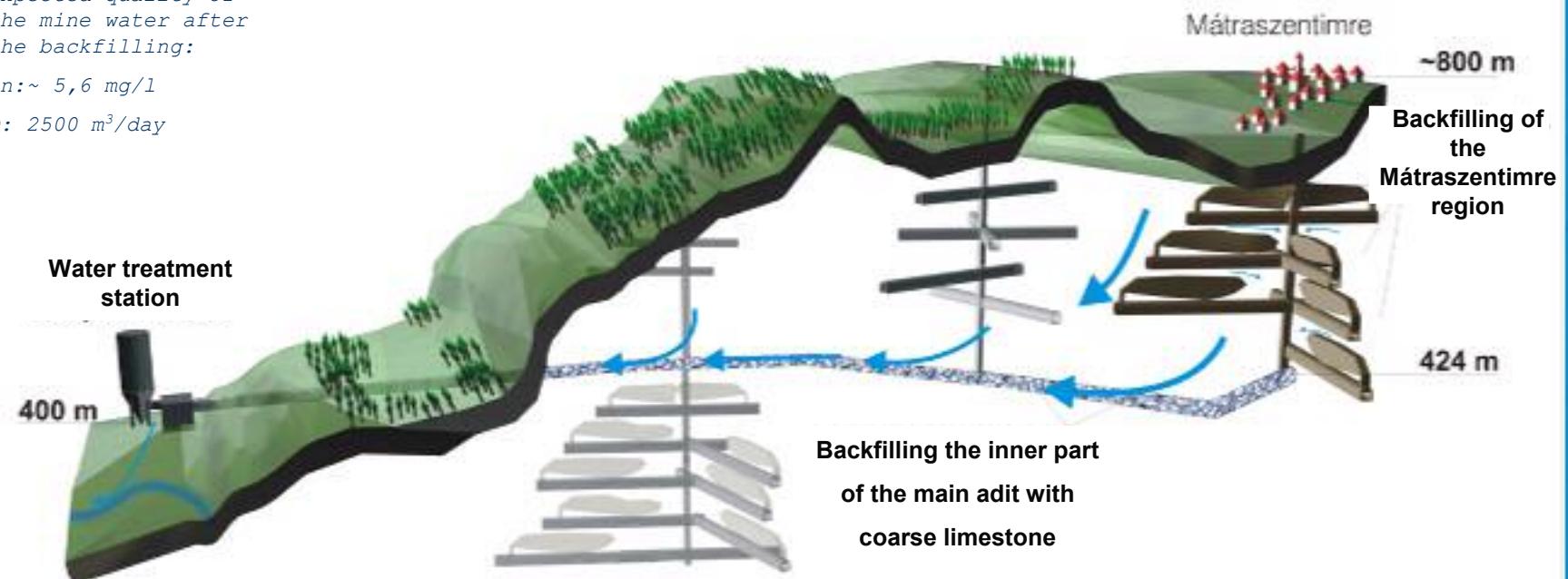
MECSEK-ÖKO
KÖRNYEZETÜZDELŐI RT.

Conception of the mine closing

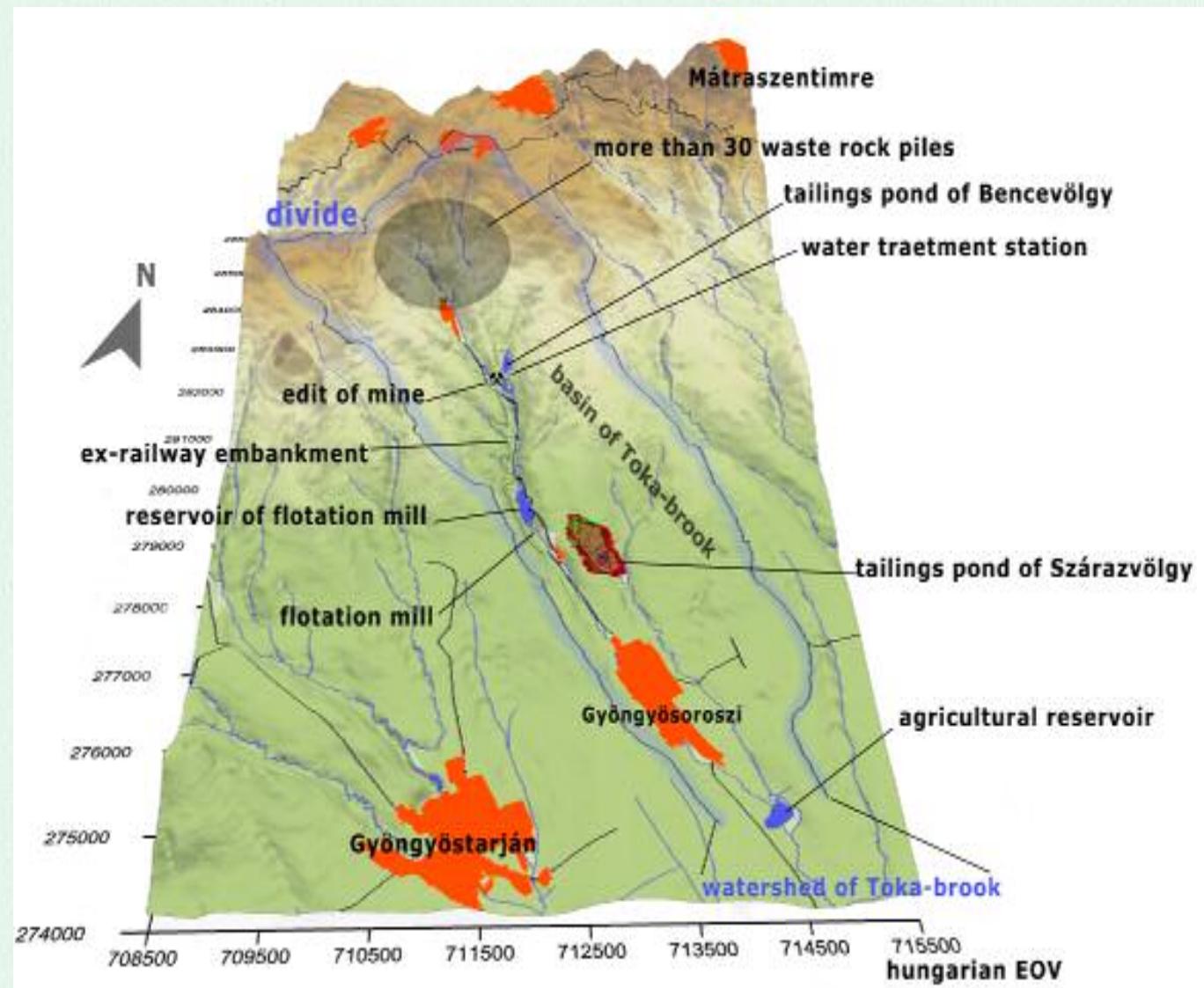
Expected quality of
the mine water after
the backfilling:

Zn: ~ 5,6 mg/l

Q: 2500 m³/day



Pollution sources on the surface





MECSEK-ÖKO
KÖRNYEZETÜZDELMI RÉSZ

Pollution sources on the surface

Tailing ponds:

Tailing pond Szárazvölgy

Tailing pond Bencevölgy

Toka-stream and catchment basin:

bed of streams

water reservoir of flotation mill (northern)

agricultural water reservoir (southern)

water reservoir Gyöngyösrédei

Waste rock piles:

more than 30 waste rock piles

(100 m³ - 50.000 m³)





Tailing pond
Bencevölgy

Recent state

Sedimentation basin I.

Water treatment plant

Underground pipeline

Pump building

Sedimentation basin II.

Toka - stream



Tailings pond Bencevölgy



Recent state

- 150 000 – 190 000 m³ water slurry
- 6 – 10 % total solid
- Non appropriate protection
- High contamination hazard

mg/kg	Zn	Pb	Cd	Cu	Mn	As
	31000	122	136	136	8517	559

Average chemical composition of water slurry

Remediation concept

- Taking-up water slurry
- Dewatering slurry
- Transportation to hazardous waste repository
- Remediation
- Deadline: 31st December 2006

Reservoir of flotation mill



Recent state

- 182 000 m³ water
- 39 000 – 40 000 m³ sludge
- Extremely high Cd concentration
- Non appropriate protection
- High contamination hazard

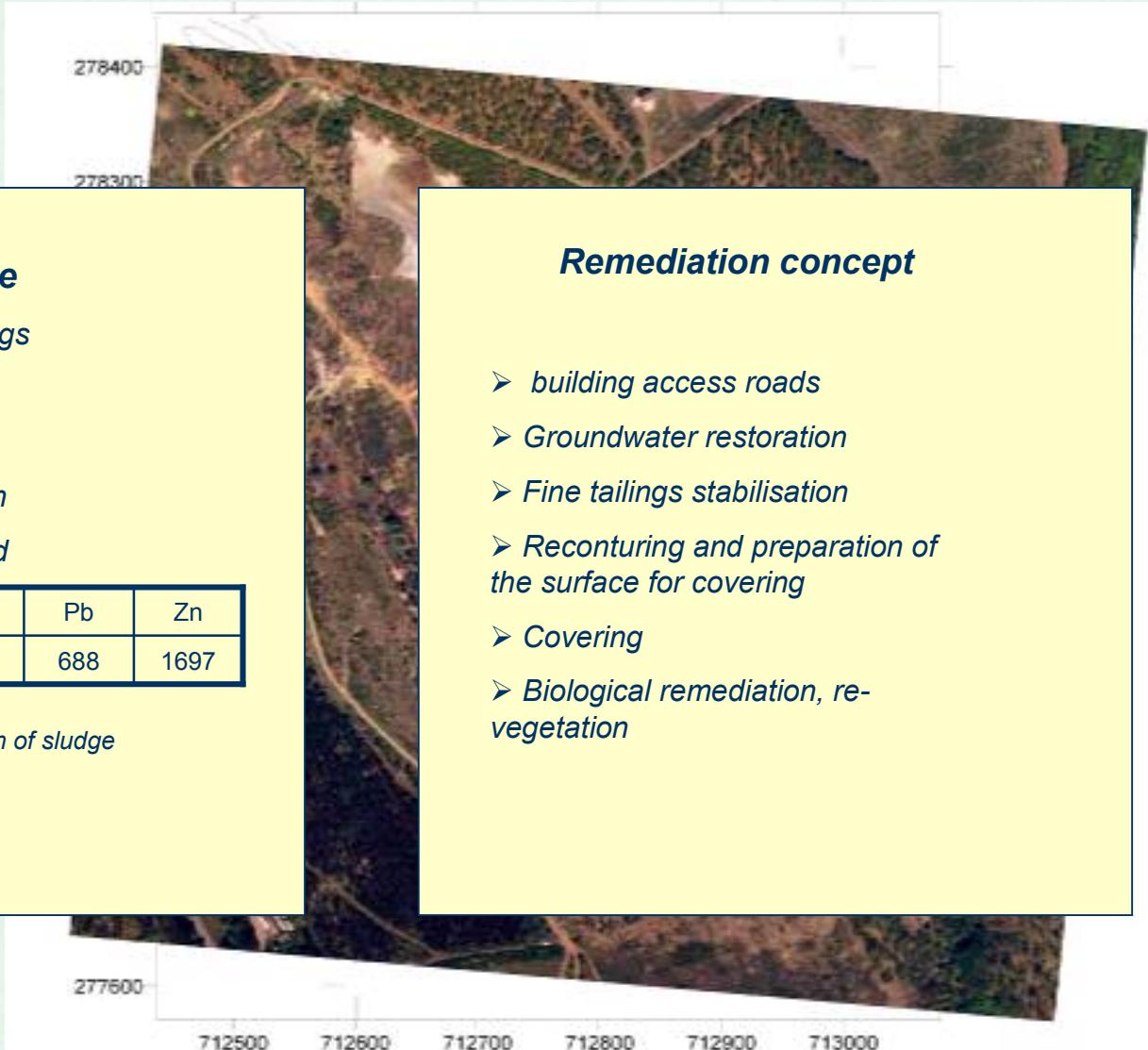
mg/kg	As	Cd	Cu	Pb	Zn
	527	81	212	288	14563

Average chemical composition of sludge

Remediation concept

- Taking-up sludge
- Dewatering sludge
- Transportation to tailings pond of Szárazvölgy
- Remediation
- Save the lake as a recreation area

Tailings pond Szárazvölgy





Drilling of monitoring wells Mszi-1, Mszi-1/1

What is the aim:

- Target area: mining cavities at 424 asl
- measuring potentiometric water level during mine closing





Environmental state surveys 2003-2004:

-More than 700

- water samples,
- waste rock samples,
- sludge samples



Toká-stream



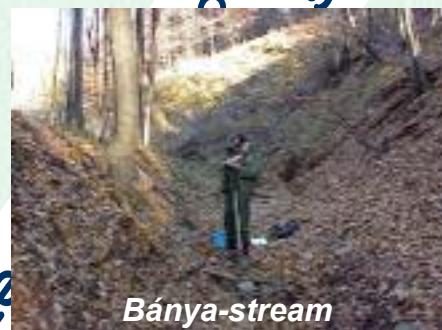
Csege-stream



Water reservoir Nagyréde



Toká-stream



Bánnya-stream



Water reservoir flotation mill



Toká-stream

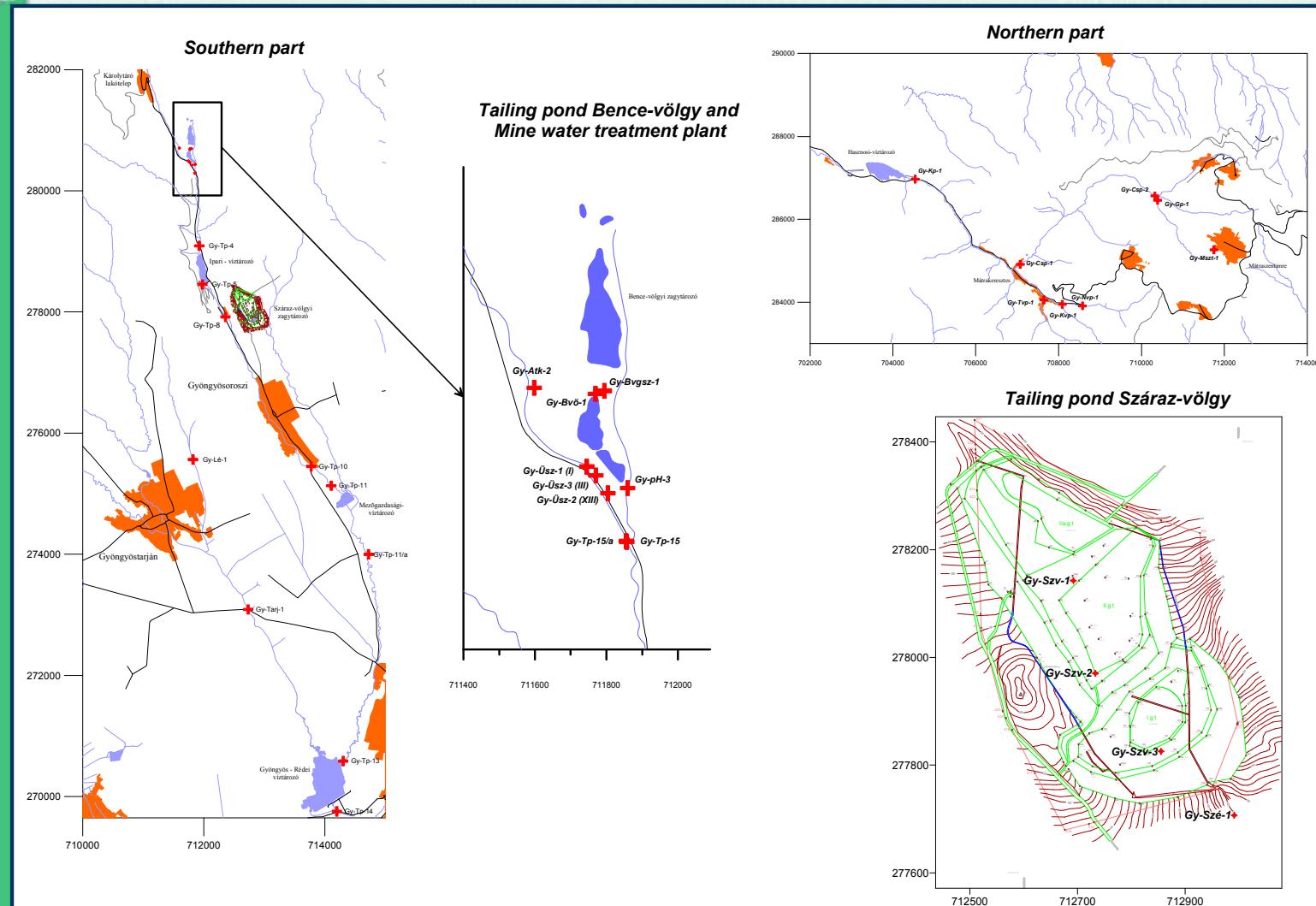


ADIT Péter-Pál



Tailing pond Bence-völgy

Hydrogeological monitoring objects





MECSEK-ÖKO
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SOMETIMES FOGGY BUT NOT GLOOMY

