

Groundwater issues in the Danube River Basin – level A



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Igor Liska, Andreas Scheidleder

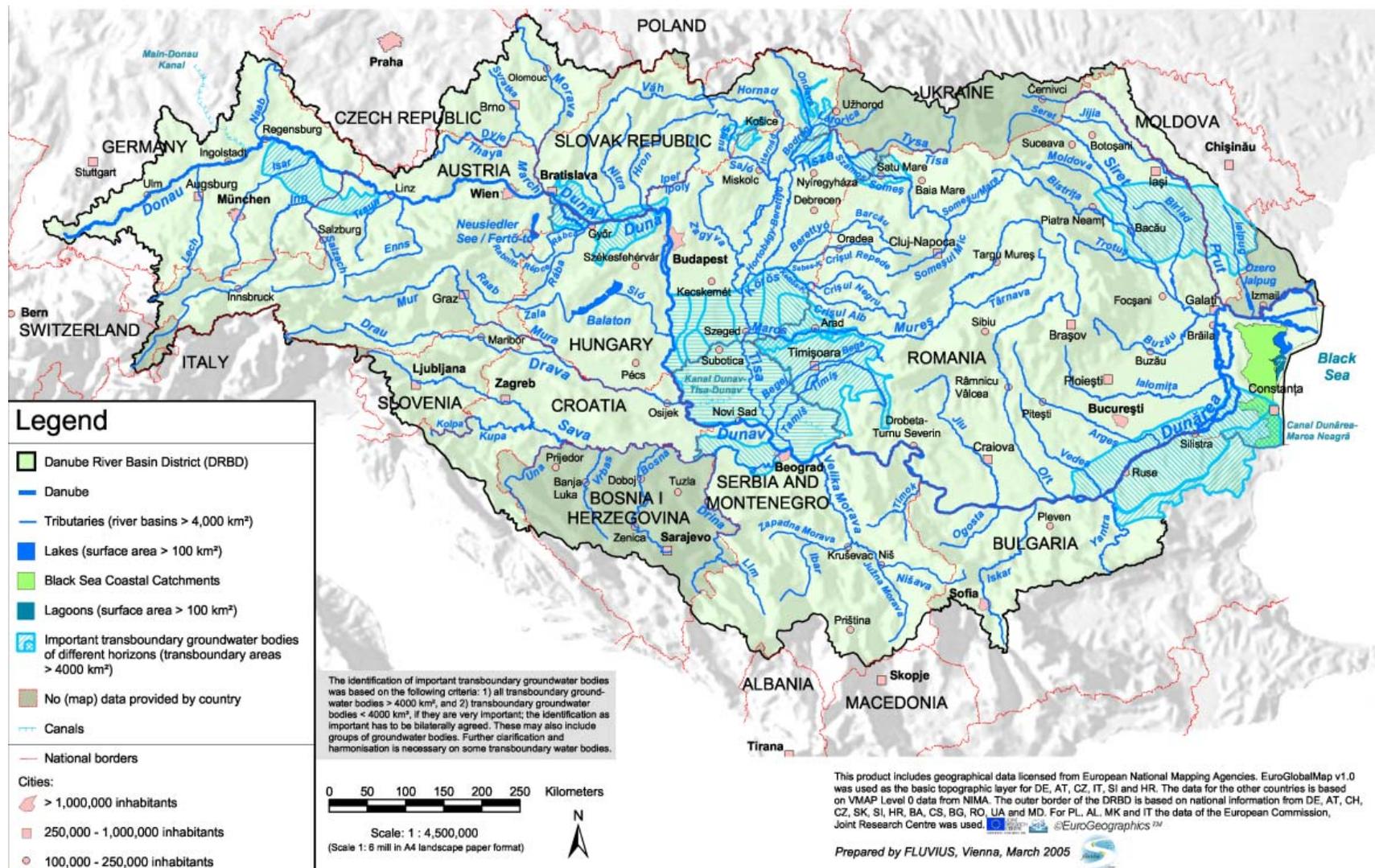
Groundwater bodies of basin-wide importance

Code	Size [km ²]	Main Use	Overlying Strata [m]	Criteria for importance	RISK Quality	RISK Quantity
DE-AT	5.900	SPA, CAL	100-1000	Intensive use	No	No
BG- RO	26.903	DRW,AGR,IND	0-600	>4 000km ²	No	No
RO-MD	21.626	DRW,AGR,IND	0-150	>4 000km ²	No/Yes*	No
RO-BG	6.356	DRW,AGR, IND	0-10	>4 000km ²	No/Yes*	No
RO-HU	6.553	DRW,IRR, IND	2-30	GW res., DRW prot.	No/Poss*	No/Poss*
RO-HU	2.416	DRW,AGR,IRR	5-30	GW res., DRW prot.	No/Poss*	No
RO-RS-HU	28.608	DRW,AGR, IND, IRR	0-125	>4 000km ² , GW use, GW res., DRW prot.	No: RO/ Poss: CS/HU*	No: RO/ Poss: CS/HU*
SK-HU	3.353	DRW,IRR, AGR, IND	2-5	GW resource, DRW protection	Poss/Yes*	No/Yes*
SK-HU	2.666	DRW,IRR	2-10	GW resource	Yes/Poss*	No
SK-HU	1.069	DRW,OTH	0-500	DRW prot., dependent ecosystem	No	No
SK-HU	3.601	DRW, SPA, CAL	0-2500	Thermal water resource	Poss	Poss

Groundwater bodies of a basin-wide importance in the DRBD

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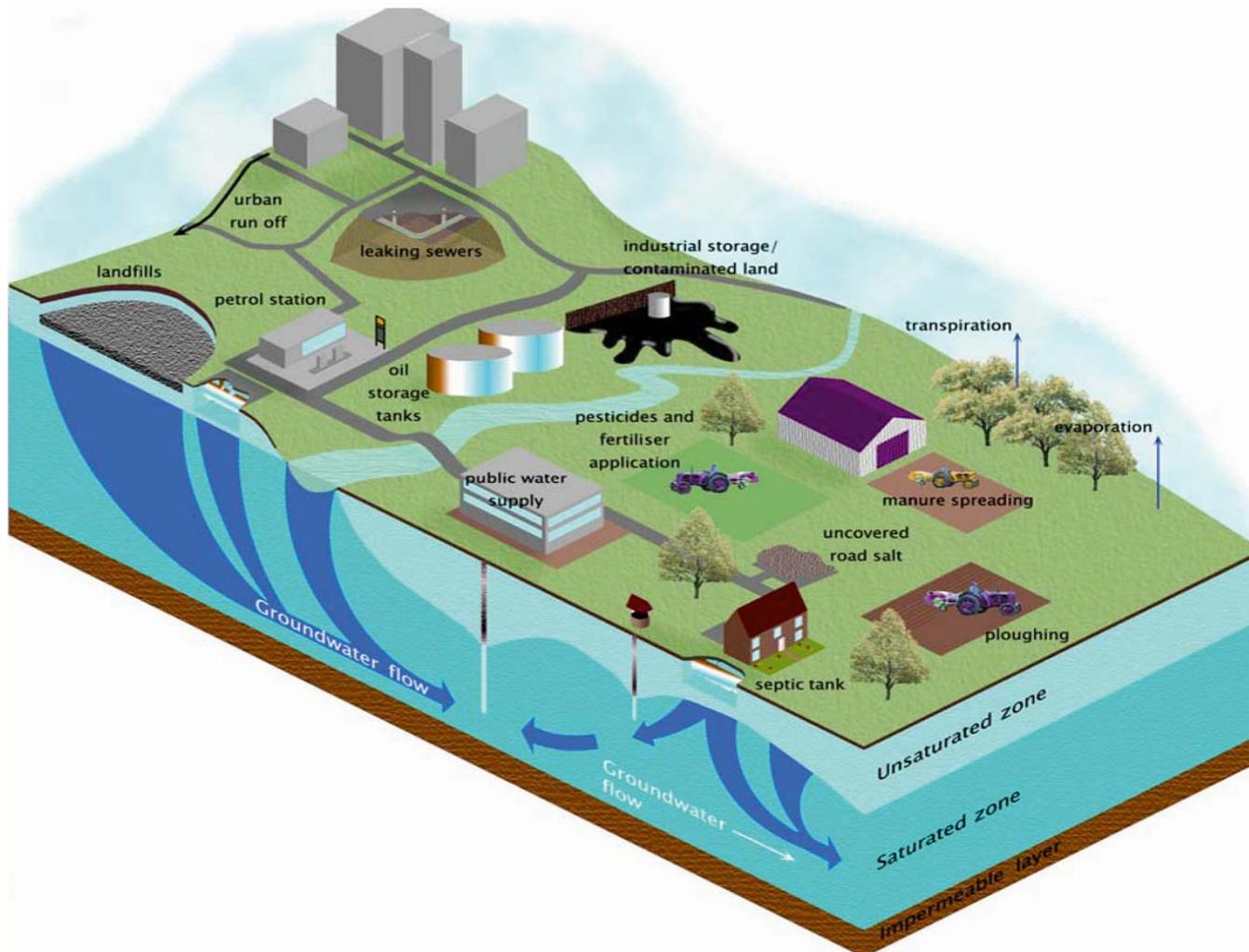
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Groundwater monitoring

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Parameters and frequency for the surveillance monitoring program



	AT/DE	BG	CS	HU	MD	RO	SK
Transboundary GWB*	1	2, 4	7	5, 6, 7, 8, 9, 10, 11	3	2, 3, 4, 5, 6, 7	8, 9, 10, 11
CHEMICAL (with estimation of frequency)							
Oxygen	1/a	>1/a	1/a	>1/a		1/a	1/a
pH-value	1/a	>1/a	1/a	>1/a		1/a	1/a
Electrical conductivity	1/a	>1/a	1/a	>1/a		1/a	1/a
Nitrate	1/5a	>1/a	1/a	>1/a		1/a	1/a
Ammonium	1/a	>1/a	1/a	>1/a		1/a	1/a
Temperature	cont.	>1/a	1/a			1/a	>1/a (selected stations)
Further parameters, e.g. major ions	x	x	x	x		x	x
operational		x		x		x	x
QUANTITY							
GW levels/well head pressure	x	x	x	x		x	x
spring flows		x				x	
Flow characteristics							
Extraction (not obligatory)	x						
Reinjection (not obligatory)	x						

GW monitoring design in the TNMN



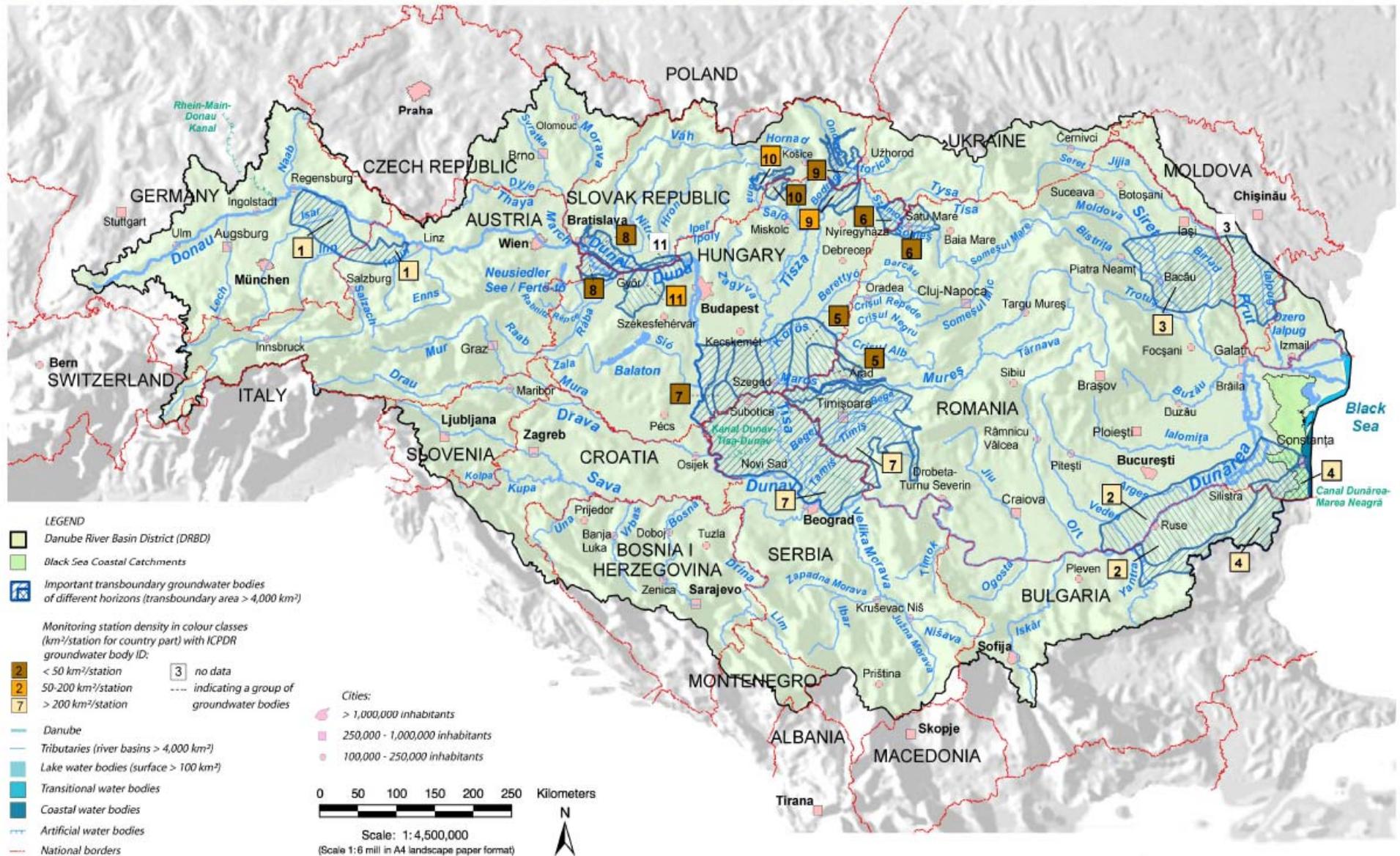
Monitoring parameters

- ⇒ Agreed obligatory parameters: **conductivity, NH₄ and NO₃**
- ⇒ All parameters for which GWBs are 'at risk' or having 'poor status'
- ⇒ Additional parameters characterising the GWB

Aggregation procedures

- ⇒ Minimum (of all sites - mean per site)
- ⇒ Mean (based on mean per site)
- ⇒ Maximum (of all sites - mean per site)
- ⇒ standard deviation
- ⇒ 10, 25, 50, 75, 90 Percentile

Reporting frequencies - Reference year: 2007, reporting year: 2008, then every 6-years (in line with reporting to EC)



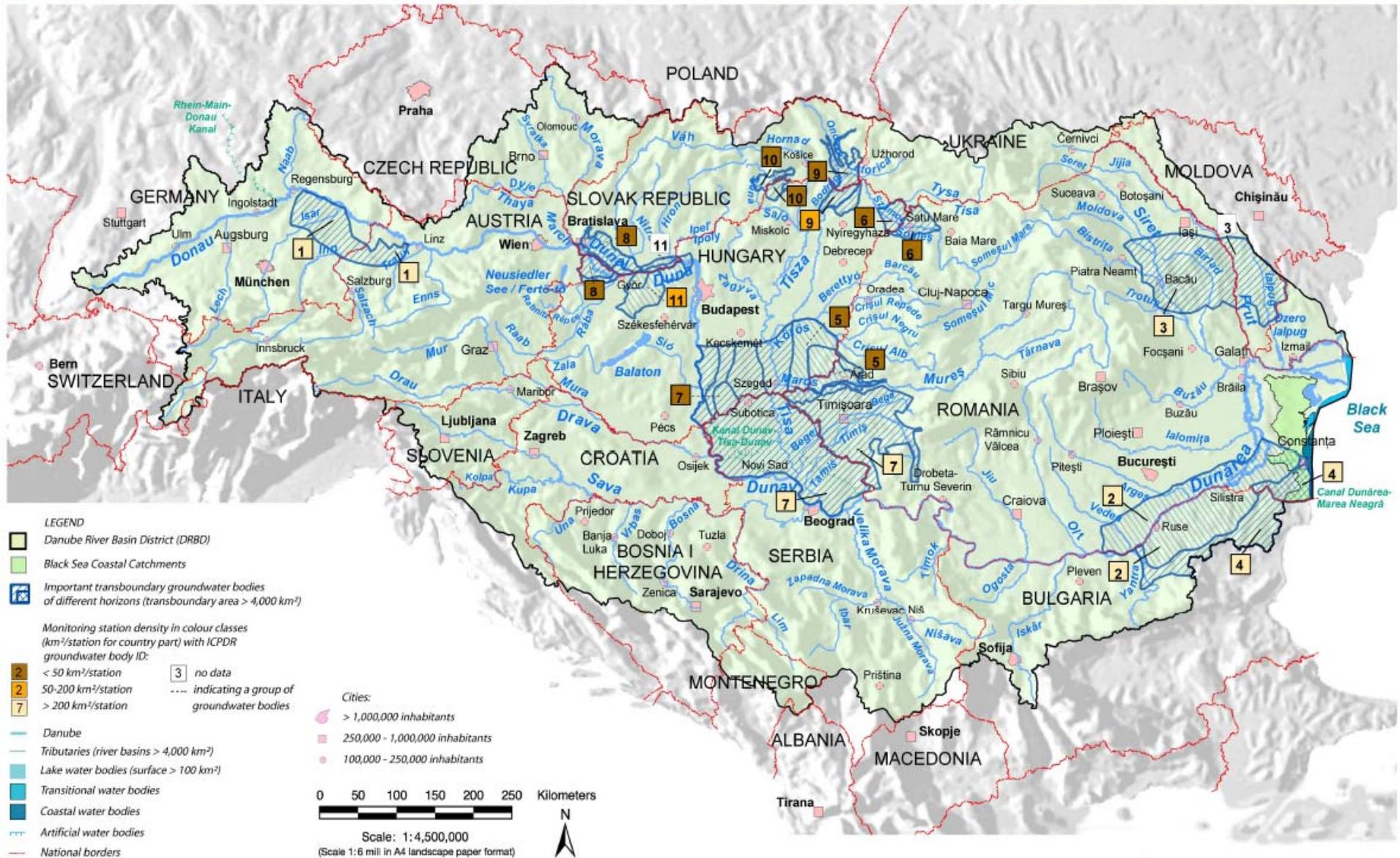
The identification of important transboundary groundwater bodies was based on the following criteria: 1) all transboundary groundwater bodies > 4000 km², and 2) transboundary groundwater bodies < 4000 km², if they are bilaterally agreed as very important. These may also include groups of groundwater bodies. Further clarification and harmonisation is necessary on some transboundary water bodies.

This product includes geographical data licensed from European National Mapping Agencies. EuroGlobalMap v1.0 (EuroGeographics) was used as the basic topographic layer for DE, AT, CZ, IT, SI and HR. The data for the other countries is based on VMAP Level 0 data from NIMA. The outer border of the DRBD is based on national information from DE, AT, CH, CZ, SK, SI, HR, BA, RS, BG, RO, UA and MD. For PL, ME, AL, MK and IT the data of the European Commission (Joint Research Centre) was used.

Prepared by FLUVIUS, Vienna, March 2007. The production of this map was financially supported by LEADER (LIFE ENVIRONMENTAL PROJECT)

Product of ICPDR, Vienna





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DRBMP Data collection



- ⇒ Status data are collected via the GIS templates for the 11 groundwater bodies of basin-wide importance
- ⇒ Data on pressures, measures and also on preliminary status assessment are collected for the 11 GWB using templates developed and agreed by the GW TG
- ⇒ Data collection process was affected by redelineation of GWB in summer 2008

Pressures to groundwater

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Assessment of pressures: Roof Report 2004



Main reasons for pollution of groundwater in the DRBD are:

- ⇒ insufficient wastewater collection and treatment on municipal level
- ⇒ insufficient wastewater treatment at industrial enterprises
- ⇒ water pollution caused by intensive agriculture and livestock breeding
- ⇒ inappropriate waste disposal sites

Assessment of pressures 2008 – GW quality



- ⇒ Pollution by nitrates from the diffuse sources is the key factor affecting the chemical status of groundwaters
- ⇒ The major sources of this diffuse pollution are
 - ⇒ the agricultural activities
 - ⇒ non-sewered population
 - ⇒ the urban land use
- ⇒ This analysis confirms the findings of the risk analysis of the Danube Basin Analysis 2004

Assessment of pressures 2008 – GW quality



Relevant point sources of pollution identified for 2 GWBs:

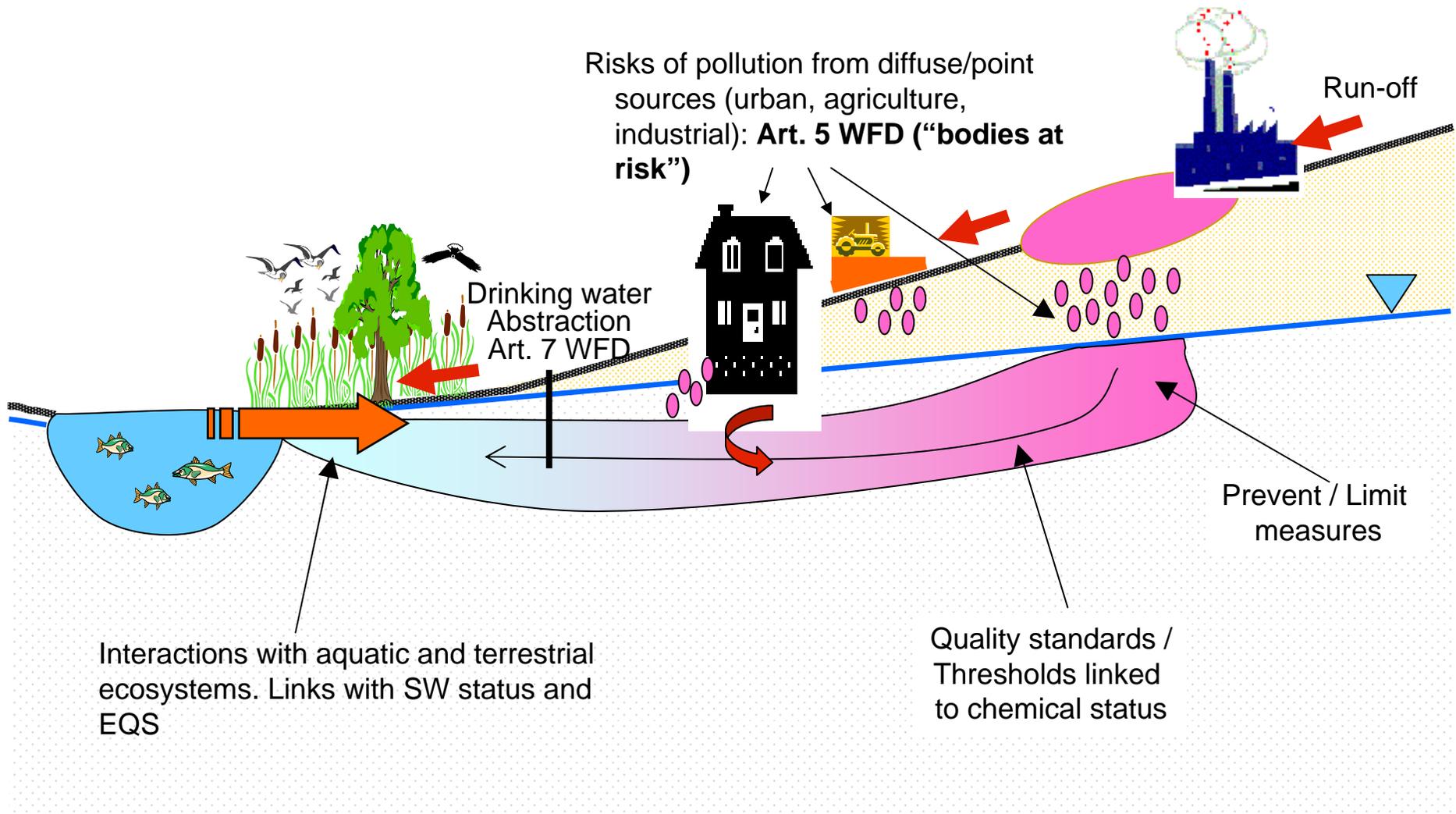
- ⇒ Leakages from contaminated sites
- ⇒ Leakages from waste disposal sites (landfill and agricultural waste disposal)
- ⇒ Leakages associated with oil industry infrastructure
- ⇒ Leakages from septic tanks
- ⇒ Discharge of used thermal water



WFD & GWD

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Assessment of pressures: Roof Report 2004



GW quantity:

- ⇒ Key role of GW use for production of drinking water in the Danube countries - about 60 % of the population in the DRB depends on GW sources.
- ⇒ GW quantity in DRB is affected by groundwater abstraction for drinking water supply or industrial and agricultural purposes.

Assessment of pressures 2008 – GW quantity

- ⇒ Over-abstraction prevents achieving of a good quantitative status for several of the level A GW bodies.
- ⇒ For one GWB a significant pressure on groundwater quantity stems from hydromorphological alterations to the Danube River impacting upon the groundwater level and dependent terrestrial ecosystems.



Status of groundwater



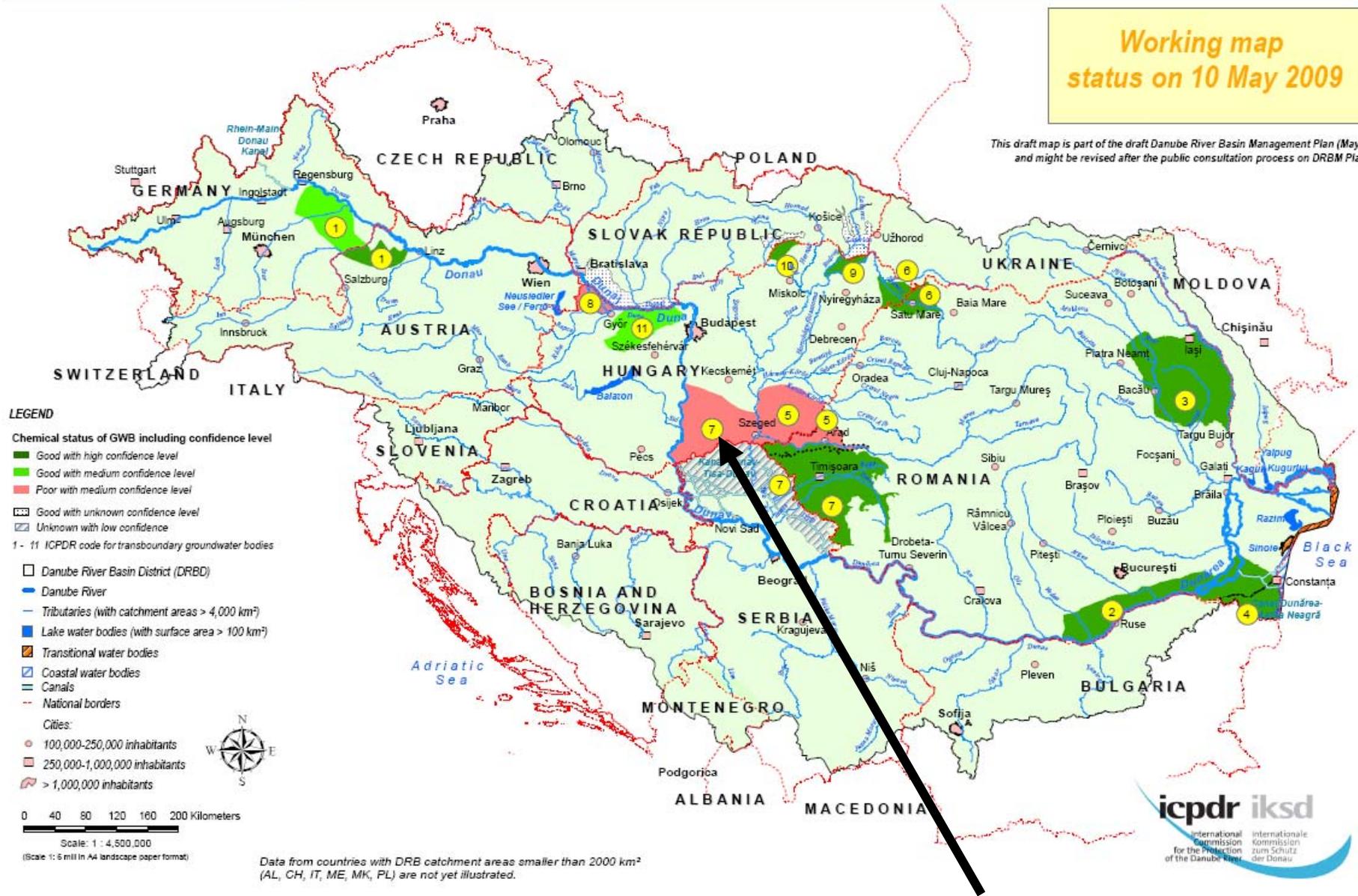
Danube River Basin District : Chemical status - Groundwater

Transboundary GWBs of basin-wide importance

MAP 15

Working map
status on 10 May 2009

This draft map is part of the draft Danube River Basin Management Plan (May 2009) and might be revised after the public consultation process on DRBM Plan



Exceeding of the threshold values for nitrates in five and ammonium in one national GWB

**Working map
status on 10 May 2009**

This draft map is part of the draft Danube River Basin Management Plan (May 2009) and might be revised after the public consultation process on DRBM Plan



Exceeding available GW resources (3), damage to terrestrial ecosystems (2) and to SW (1), former mining activities (1)

Measures

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Visions

- ⇒ GW quality: the emissions of polluting substances do not cause any deterioration of groundwater quality in the Danube River Basin District. Where groundwater is already polluted, restoration to good quality will be the ambition.
- ⇒ GW quantity: the water use is appropriately balanced and does not exceed the available groundwater resource in the DRBD, considering future impacts of climate change.



Basin wide management objectives – GW quality



All countries:

- ⇒ Elimination/reduction of the amount of hazardous substances and nitrates entering the groundwater bodies in the DRBD to prevent deterioration of groundwater quality and to prevent any significant and sustained upward trends in the concentrations of pollutants in groundwater.
- ⇒ Implementation of the management objectives described for organic and nutrient pollution of surface waters.



Basin wide management objectives – GW quality



All countries:

- ⇒ Increase of the wastewater treatment efficiency.
- ⇒ Implementation of Best Available Techniques and Best Environmental Practices.
- ⇒ Reduction of pesticide/biocides emission in the DRBD.



Basin wide management objectives – GW quality



In addition, for EU Member States:

- ⇒ Implementation of the principle concerning prevention/limitation of pollutants inputs to groundwater according to EU Groundwater Directive (2006/118/EC).
- ⇒ Implementation of the EU Nitrates Directive (91/676/EEC).
- ⇒ Implementation of the Plant Protection Directive (91/414/EEC) and the Biocides Directive (98/8/EC).
- ⇒ Implementation of Urban Wastewater Treatment Directive (91/271/EEC).
- ⇒ Implementation of the Integrated Pollution Prevention Control Directive (96/61/EC), which also relates to the Dangerous Substances Directive (76/464/EEC).

Basin wide management objectives – GW quantity



All countries:

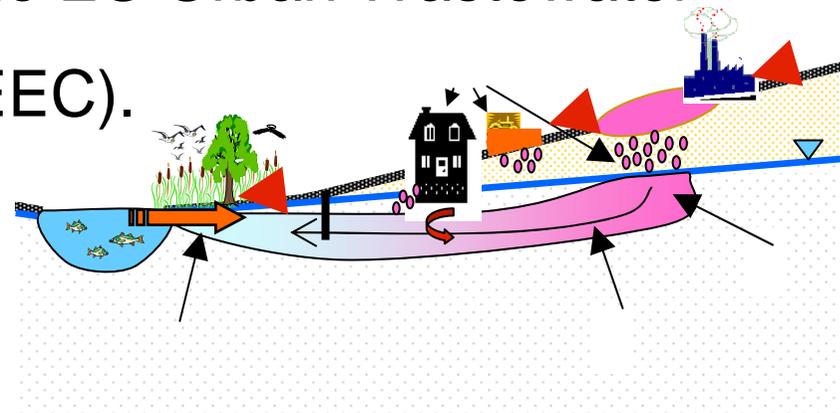
⇒ Over abstraction of GW-bodies within DRBD is avoided by sound groundwater management.

In addition, for EU Member States:

⇒ Implementation of WFD (2000/60/EC) requirements that the available groundwater resource is not exceeded by the long-term annual average rate of abstraction

Measures to achieve the management objectives 2015: GW quality

- ⇒ Nitrate contamination is a key hindrance to achieving a good chemical status.
- ⇒ It is essential to eliminate or reduce the amount of nitrates primarily through the implementation of the EU Nitrates Directive (91/676/EEC) and the EU Urban Wastewater Treatment Directive (91/271/EEC).



Measures to achieve the management objectives 2015: GW quality



- ⇒ To prevent pollution of groundwater bodies by hazardous substances from point source discharges an effective regulatory framework has to be put in place ensuring prohibition of direct discharge of pollutants into groundwater.
- ⇒ All necessary measures have to be set required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents.
- ⇒ *Link to JPM for surface waters (hazardous substances)*

Measures to achieve the management objectives 2015: GW quantity



- ⇒ Water use in the DRBD has to be properly balanced taking into account the conceptual models for the particular GW bodies and should not exceed the available GW resource
- ⇒ Appropriate controls over the abstraction of fresh surface water and groundwater and impoundment of surface waters including a register or registers of water abstractions must be put in place.
- ⇒ The concept of registers of GW abstractions is well developed throughout DRBD.
- ⇒ Rehabilitation activities / restoration of wetlands in contact with aquifers

Thank you for your attention

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