2.6 Status and Trend Assessment

2.6.1 Polish Methodology for Assessment of the Chemical Status of Groundwater

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The assessment of chemical status of groundwater bodies under the Groundwater Directive of EU (in preparation) is based on environmental quality standards (EQS) and the threshold values (TV). This approach is focused on human health as a main risk receptor, and contains also other elements of aquatic and terrestrial ecosystems dependant on groundwater. In Poland, in addition to the methodology recommended under WFD (WFD CIS WG_C, 2005) and GWD (GWD, 2006), classification of groundwater into five classes is being proposed (fig. 1). The first three clases represent good chemical status of a groundwater body and the remaining two represent poor chemical status. These classes are defined for 55 elements and physicochemical parameters. The classification allows for a more detailed insight into the chemical status of groundwater and in consequence allows more flexible management of the given groundwater body.

No	Parameter	Units	Natural Background Levels NBL	...I…	…II…	..III...	..IV…	…V…
9	NO_3	mg/L	0 - 5	10	25	50	100	>100
14	Cl-	mg/L	2 – 60	60	250	300	500	>500
8	As	mg/L	0.00005-0.020	0.010	0.010	0.100	0.200	>0.200
22	Cd	mg/L	0.0001 – 0.0005	0.001	0.003	0.005	0.010	>0.010
25	Mn	mg/L	0.01 – 0.4	0.05	0.4	1	1	>1
42	Fe	mg/L	0.02 – 5	0.2	1.0	5	10	>10

Fig. 1: Fragment of groundwater classification used in Poland

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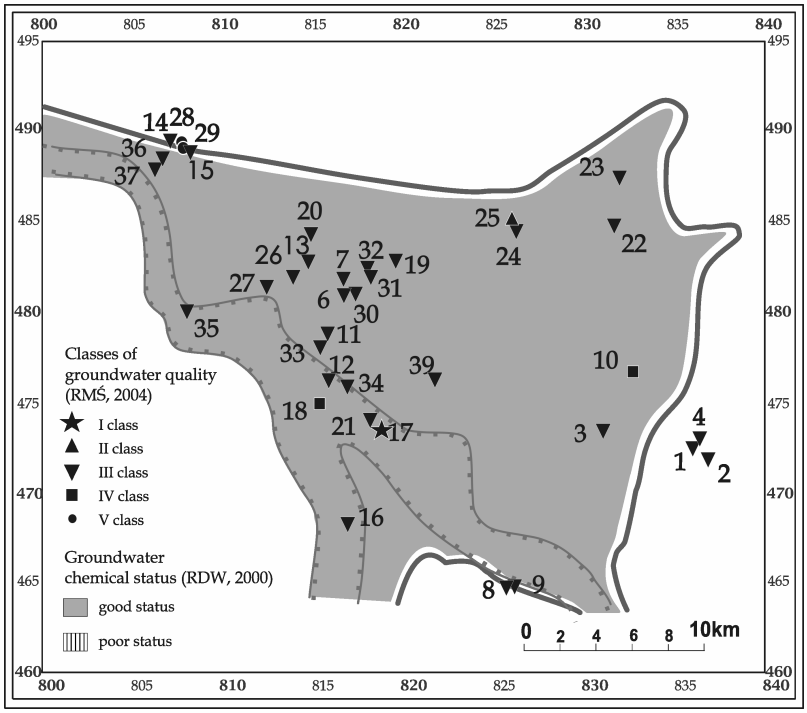

Fig. 2: Example of chemical status assessment of groundwater body.

Is is apparent from the fig.2 that although the groundwater body as a whole can be in a good chemical status, there are regions with water of high quality (class I) which require special protection and also the monitoring sites with water of poor chemical status (classes IV &V) which require action. The proposed classification, when applied to monitoring practice, allows also visualization of changes in quality of individual sites and individual segments of the given groundwater body.

References

GWD, 2006 -- Groundwater Daughter Directive – Proposal for a Directive of the European Parliament and of the council on the protection of groundwater against pollution 2003/0210 (COD), 23 January 2006

RDW, 2000 – Water Framework Directive, Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy from 23 of October of 2000

WFD CIS WG_C (2005). Groundwater summary report. Technical report on groundwater body characterization, monitoring and risk assessment issues as discussed at the WG C workshop in 2003-2004.

2.6.2 Recommendations for Groundwater Threshold Values in the Netherlands

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The Dutch ministry of housing, spatial planning and the environment asked the Soil protection technical committee (TCB) for recommendations on which environmental considerations should be taken into account in setting threshold values for groundwater. In its advise the TCB indicates a range of existing Dutch groundwater quality standards which it considers to be suitable threshold values.

In determining the level of the threshold values, the TCB was guided by the following principles:

- Given the scale, the TCB considers the threshold values a highly suitable frame of reference for the policy on large-scale diffuse groundwater pollution. Current Dutch decontamination policy can continue to apply to local point-source pollution and regional groundwater pollution where the Dutch intervention value for groundwater quality has been exceeded.
- Threshold values have a function when it comes to protecting both groundwater itself and surface water fed by groundwater. The latter function is particularly important in areas where shallow groundwater is in contact with surface water. In the interest of creating the simplest and most user-friendly system of standards, the TCB is in favour of a threshold value which can cover both protection objectives.
- The TCB believes that threshold values should be based on existing risk levels. The Dutch system of environmental quality standards is already very extensive and complicated. With this in mind, the TCB sees no sense in adding new risk levels.
- To facilitate management, the TCB supports national threshold values wherever possible and region-specific modifications wherever necessary. As for anthropogenic substances, the TCB sees no reason for a region-specific approach and would prefer to see national threshold values used in all cases.
- The TCB believes it is impractical to use the natural background concentration as the threshold value. This would lead to an undesirable situation in which the threshold values were repeatedly exceeded, even though environmental and drinking water standards were not seriously affected.

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In keeping with current Dutch groundwater quality management, the TCB regards the Dutch target values as a suitable threshold value. Target values indicate the quality level at which there is a sustainable groundwater quality. They form the long-term objective and frame of reference by which the government can determine whether the source-directed policy is sufficiently effective. Another option is to follow the example of Dutch surface water quality management. This uses the Maximum Permissible Concentration (MPC) based on ecotoxicological data, as a minimum quality level, while the final, long-term objective is embodied by target values. A similar approach could be followed for groundwater.

The TCB finds the Dutch intervention value unsuitable because this standard tends to be oriented towards local groundwater pollution. Threshold values apply to bodies of groundwater or larger units. Because groundwater pollution is not easy to detect, changes in groundwater quality occur very slowly and the decontamination of polluted groundwater can often only be achieved through major groundwater purification, the TCB is opposed to using intervention values as threshold values on this scale. To protect ecosystems and strategic groundwater reserves from this type of large-scale pollution, action should be taken at an earlier stage.