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Some comments on the Draft United Nations Framework Classification For Resources. Supplemental Groundwater Specifications.

My comments are based on many years of experience in hydrogeological research and assessment, including groundwater resources, in Kazakhstan and the countries of the former USSR.

As far as I know, the work on the development of Supplemental Groundwater Specifications started a long time ago. And I congratulate the members of the GRWG 2019-2023 on the completion of their work.

1. As stated in The Need for Supplemental Groundwater Specifications: "The UNFC is designed to be applied to all resource projects to improve resource management and make better decisions. Its generic specifications harmonize resource projects and quantity reporting across different resource types. However, each resource has its own community of experts with its own definitions and standards. The purpose of this Supplementary Groundwater Specifications document is to provide groundwater practitioners with technical guidance on the application of UNFC to groundwater resource projects. The intended audience for these specifications are resource managers and groundwater professionals who have appropriate expertise and relevant experience in the operation of groundwater projects and the estimation of groundwater quantity and quality".

Nevertheless, this is an addendum to the classification of mineral resources and reserves. However, the groundwater has characteristics that make it different from mineral resources, and make the use of same classification difficult.

Although groundwater is a component of the subsoil, it also participates in the Earth's overall water cycle and ensures the sustainable development of several ecosystems. In addition, groundwater is a vital resource; in many areas it is the only source of drinking water available to meet human needs.

There is legislation regarding groundwater at the international level (global UN Conventions on water, Draft Articles on the Law of Transboundary Aquifer). There are laws from the perspectives of use (permitting) and protection of water resources.

In a number of countries, groundwater resources governance is the responsibility of water resource authorities. These authorities issue permits for specific water uses on the basis of data on operational groundwater resources, the reports of which have passed state examination.

That is, the target function of groundwater resources is determined when setting the task of assessing their operational resources. Before carrying out such work, the required quantity of these operational resources and groundwater quality are determined.

Therefore, the determination of operational groundwater reserves is as follows:

"Operational groundwater resources - the quantity of groundwater that can be extracted from a well field (site) using geologically and technically sound water intake structures under a given operating mode and conditions, and of a water quality that meets the requirements for the intended use during the estimated period of water consumption, taking into account environmental restrictions.

Predicted groundwater resources are the quantity of groundwater of a given quality and for a given purpose that can be extracted within a hydrogeological region, river basin and administrative area and represent the potential possibilities for its use".

Regional studies, prospecting and exploration precede the assessment of operational groundwater resources.

2. At present, in Kazakhstan (and other countries of the former USSR), operational groundwater resources are divided, according to the level of knowledge, into developed - categories A and B,

explored - categories B, and assessed - categories C₁ and C₂. Predicted groundwater resources, according to the degree of validity, belong to category P. Each category of resources serves as a basis for the implementation of certain stages of design decisions to prepare water well-fields for further study and development.

There is a "hydrogeological" management of the extraction of the required quantity and quality of groundwater in different types of aquifers and hydrogeological conditions (e.g. optimization of the location of water wells, distribution of extraction rates between wells, optimization of the operation mode of water -wells, MAR, etc.). These issues do not relate to classification and are not addressed in the Draft, and this is correct, in my opinion.

Operational groundwater resources of categories A, B and C₁ must meet a number of specific requirements and are intended to justify the possibility of designing or reconstructing a water intake structure.

It is precisely for these categories of operational resources that the national accounting of groundwater is carried out. For a governance organization, such an accounting system is quite sufficient due to its simplicity and sufficiency, first of all.

3. It seems that the fractional division of operational resources proposed in the Draft for groundwater resources management is hardly necessary:

- First of all, according to Table 2 - E Axis – Environmental-Social-Economic Viability: Schedule E.A and Table 3 - E Axis – Environmental-Social-Economic Viability: Schedule E.B, only E.A.1 and E.B.1 **are sufficient**. The need for water of a certain quantity and quality is justified before exploration and assessment are carried out. And the evaluation of the operation's impact on the environment carried out in the reports is approved by the state-authorized body for environmental protection. That is, after the state examination of the report, "Development and operation are **always** confirmed to be environmentally-socially-economically viable". And there can be no obstacles to issuing the necessary permits.

- According to Table 4 - Technical Feasibility and Maturity – The F-Axis Score, only F1 is sufficient (with a positive state examination of the report) - The technical feasibility of a development project has been confirmed. Which follows from the definition of the term "operational groundwater resources" (see above).

- According to Table 5 - G Axis – Degree of Confidence, the assessment must be reliable, which is determined by the state examination.

Therefore, using the Draft to assess the operational resources of groundwater when their required quantity and quality have been determined in advance (by the target function of their use, and not only for domestic and drinking water supply) seems as inappropriate.

Therefore, using the Draft to assess the operational groundwater resources when their required quantity and quality have been determined in advance (by the target function of their use), and to the national water resources accounting system seems not advisable.

4. When draining mineral deposits, development projects for which are drawn up, including according to the CRIRSCO Classification, groundwater resources are formed that require assessment and obtaining permission for their use or discharge.

In my opinion, the draft (after modification) can only apply to these waters, as well as thermal power and industrial groundwater (with useful dissolved components), which are taken into account in the cadastre of mineral resources and reserves.