Institute of Hydrogeology and Engineering Geology

Projects received by the Shota Rustaveli National Science Foundation grant

Annex

№	Grant Name	Head of the project	Years of project start and end	Amount, GEL	Status completed/in progress	Grant code
1	Scientific devices and equipment, replenishment of scientific library fund, access to foreign electronic literature base	Z. Kakulia	2021-2022	70 000.0	completed	RIM-3-21-033
2	Computers, software, electronic databases required for the library network, scanners, photo-video recording equipment, other computer equipment and accessories	Z. Kakulia	2022-2023	13 000.0	completed	RIM-5-22-213
3	Scientific devices and equipment, replenishment of scientific library fund, access to foreign electronic literature base	Z. Kakulia	2023	20 000.0	in progress	RIM-3-23-054

Abstracts:

1. In 2022 Photometer PFP7 and Underground Water Detector RIVER G3 were purchased within the framework of the project RIM-3-21-033 of Shota Rustaveli National Science Foundation of Georgia, which were successfully used in the implementation of scientific budget sub-projects of Hydrogeology and Geoecology departments of the Institute of Hydrogeology and Engineering Geology. Flame Photometer PFP7 along with other tools allowed us to measure the mineral waters of Kvemo Savaneti (Lentekh district) and the rivers Lukhuni and Kvirila for complete water analysis. Determining the content of Na and K separately allowed us to determine the types of mineral waters and, most importantly, by

determining Na, we determined the exact sodium content in mineral waters, which is so necessary for mineral waters.

The Underground Water Detector RIVER G3 allowed us to determine the salinity of groundwater, the spatial arrangement of aquifers and impermeable rocks, and most importantly - without conducting exploratory drilling, we determined the depth of groundwater (up to 1500 m), which significantly reduces the cost of hydrogeological exploration. In Kvemo Svaneti in 2022, under the conditions of field work, we selected three mineral springs (outlets). The first one is located in the territory of the district center Lentekhi, the second outlet (source) is in the beautiful Muash resort, and the third one is Ferdobdze, located in Sasashi village. At these points, the depth of mineral water was determined using the underground water detector.

In the future, we will actively use the acquired tools during the search and research of underground waters (fresh, mineral, thermal).

2. In 2023, two personal computers were purchased within the framework of the project "Competition to promote the renewal of the material and technical base of scientific and research units of scientific and research institutions of higher educational institutions" RIM-5-22-213 of Shota Rustaveli National Science Foundation of Georgia. Computer technology is a necessary tool for the full implementation of the research goals and set tasks according to the plan-schedule, in order to carry out many field expeditionary and laboratory studies and seasonal research conducted during the whole period of the implementation of the budgetary research project "Research of hydrogeological and engineering-geological problems of Georgia for the purpose of rational use of resources and environmental protection". Monitoring results will be generated in a single data base, the dependence and trends of the obtained information can be created analytically, as well as with such software as electronic spreadsheets (Excel, MathCAD, MathLab), geoinformation system programs ArcGIS and Surfer will be used for analysis and visualization, we will use them to perform separate tasks AutoCAD and AutoCADcivil.

The implementation of the mentioned project contributes to the updating of the computer equipment base of the Institute of Hydrogeology and Engineering Geology and further development and expansion of scientific research.

Within the framework of the project will be created:

Electronic map of the occurrence of mineral waters; Schematic engineering geological map of loess-like rocks distributed on the territory of Georgia; The mathematical model of the roaring rivers and the ecological condition of Lukhun (heavy metal content) will allow us to determine the degree of pollution at any point.

3. The methods of hydrogeological research will be refined with the tools (bidistillator and GPS type geodesic tool) purchased within the framework of the current scientific budgetary

project "Research of hydrogeological and engineering geological problems of Georgia for the purpose of rational use of resources and environmental protection".

The purchase of a bidistillator for the implementation of the project and for future research will contribute to the supply of ideally clean water for the preparation of standard solutions for the laboratory equipment in the institute, which is a necessary prerequisite for the full spectrum of complex chemical analysis.

The successful implementation of the project largely depends on the attraction of modern technologies and their use. In this regard, the management of our institute decided to apply to the Rustaveli Foundation for the purchase of a new generation GPS-type geodetic tool. This GPS navigator allows to use it during engineering-geological planning of territories. In carrying out such works, great importance is attached to the accurate determination of the boundaries of the geodynamic processes and events spread in the territory and their mapping. In addition, the mentioned GPS navigator allows for the photo fixation of the territories and to determine its location in the coordinate system with great accuracy, and in case of processing the received field material in the appropriate program, it becomes possible to receive a 3D image of the territory and with it to carry out modeling and forecasting of the geodynamic processes taking place within the study area.

The works performed at such a level allow to successfully develop effective measures against the geodynamic processes taking place in the study area.

The mentioned tools will be used by the hydrogeology, engineering geology and geoecology monitoring departments of the institute.