



Environmental Protection of International River Basins Project

Contract No. 2011/279-666



This project is funded by
The European Union

A project implemented by a Consortium
led by Hulla & Co. Human Dynamics KG

Annex 1:

Terms of Reference

Provision of gauging equipment for Akhuryan-Akhurik transboundary hydrological post in Akhuryan RBD of Armenia

I. Background

The construction company will assist Human Dynamics to fulfil its requirements under the EU technical assistance contract “Environmental Protection of International River Basins (EPIRB)”. The overall objectives of the EPIRB project are:

- To improve availability and quality of data on the ecological, chemical, and hydro-morphological status of trans-boundary river basins including groundwater; and
- To develop River Basin Management Plans for selected river basins / sub-river basins according to the requirements of the WFD.

The project is being implemented in six countries (Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine) and five pilot river basins:

- Akhurian River Basin District (Armenia),
- Central Kura (Azerbaijan),
- Upper Dnieper Basin (Belarus, Ukraine),
- Chorokhi-Adjaristskali Basin (Georgia),
- Prut Basin (Moldova, Ukraine)

As part of the River Basin Management Plan development process the EPIRB project will implement selected number of improvement measures from the overall Programme of Measures (PoM), as defined under the Water Framework Directive. The selected measures have been agreed with the beneficiaries in each country and will be executed in accordance with the EC contractual conditions. In the Republic of Armenia the following measures have been chosen:

- Refurbishment of new groundwater monitoring borehole in Aknashen community of the Akhuryan RBD of Armenia, including installation of automated equipment (completed). The objectives of the project were (1) supporting the MNP in addressing the issues of artesian groundwater overuse in the Ararat Valley through collecting more accurate groundwater monitoring data; and (2) promoting more efficient decision-making groundwater allocation in the Ararat Valley. In the framework of the pilot project, a new groundwater monitoring well was constructed in Aknashen community. It was refurbished and modern water level and temperature measuring equipment and automated data transfer was installed. The transfer of data to the Hydrogeological Monitoring Centre of the MNP, the authorized institution for groundwater monitoring in Armenia, is being implemented through telemetric technologies. After installation of equipment, the appropriate training has been provided to the staff members of the Hydrogeological Monitoring Centre;
- A demonstration project for the automated monitoring of critical water abstractions in the Metsamor (Sevjur) River basin in order to strengthen compliance and improve water resource planning and management (completed). The overall goal of the project was to support regulation of surface and

groundwater use in the Akhuryan RBD, ensuring a transparent decision-making process through introduction of automated centralized control system. WRMA of the MNP, Akhuryan BMO of the WRMA, and Environmental Inspectorate of the MNP were the three main beneficiaries of the project. In the first stage, detailed terms of reference were prepared for the development of an automated, centralized, on-line control system of actual water use in Metsamor River basin. In cooperation with the project subcontractors, "Geoinfo" LLC and "Locator" CJSC, appropriate computer software for maintaining the automated, centralized, on-line control system was created, which is based on the SCADA¹ system, was developed in addition to a data import/export tool between the SCADA system and State Water Cadastre Information System.

In the second stage, three pilot water users were selected and abstractions automated, centralized, on-line control system installed: one small, one medium and one large fish farm were selected in Jrrat, Araks and Metsamor communities respectively.

Flow meters and data loggers and the equipment and the developed computer software were tested accordingly.

Appropriate computer equipment has been provided to the three "control points" in WRMA, Akhuryan BMO and Environmental Inspectorate of the MNP and training on the use of the systems was conducted for the staff members of the mentioned organizations. A brief user manual was prepared and distributed to the participants of the training courses.

Finally, a full economic assessment for introduction of the system throughout the entire Metsamor River basin was undertaken. The study covered all 213 surface and groundwater use points in the basin and the results of this study were submitted to the Ministry of Nature Protection of Armenia;

- Rehabilitation of 10 (ten) priority groundwater monitoring springs in Akhuryan catchment of the Akhuryan RBD of Armenia;
- Rehabilitation of Akhuryan-Akhurik transboundary hydrological post in Akhuryan RBD of Armenia, including installation of gauging equipment;
- Additional support to formal adoption of the River Basin Management Plan for Akhuryan RBD of Armenia, including passing State Environmental Expertise.

The following Terms of Reference are for the *rehabilitation of Akhuryan-Akhurik transboundary hydrological post in Akhuryan RBD of Armenia*.

II. Scope of Work

Akhuryan-Akhurik transboundary hydrological post was established in 1941. It is located on Akhuryan River, 5 km upstream of the Akhuryan Reservoir. The absolute altitude of the post is 1456.5 m above the sea level. The post has very importance hydrological role, since it provides information on the total inflow from Armenia to Akhuryan transboundary reservoir, shared with Turkey.

¹) SCADA (supervisory control and data acquisition) is a system for remote monitoring and control that operates with coded signals over communication channels (using typically one communication channel per remote station).



While the post is one of the most important hydrological observation point in Akhuryan River Basin, and provides important information both from national and transboundary perspectives, the post itself and equipment used is out-dated. Thus, water discharge is measured using a ropeway, and for water level ruler and stream gauging equipment are used. However, nowadays the ropeway of the hydrological post is in emergency situation, and during high flows it is very dangerous to make measurements. It needs fundamental renovation. For water discharge measurements Soviet time flow meters “GR-21m” us being used, which is not subject to renovation any more, and basically needs replacement with a new flow meter. For water level measurements Soviet time stream gauge equipment “Valday” is used, which currently does not work and needs replacement.

Taking into consideration that the Armenian State Hydrometeorological and Monitoring Service of the Ministry of Emergency Situations of the Republic of Armenia (Hydromet) has applied to EPIRB project with a request for a pilot project on rehabilitation of Akhuryan-Akhurik hydrological observation post, including rehabilitation works and installation of modern gauging equipment. Based on that on December 17, 2015 a contract was signed between the EPIRB Project and the Hydromet on preparation of design documentation and site supervision for rehabilitation of Akhuryan-Akhurik transboundary hydrological observation post, and preparation of technical specification of the gauging equipment to be installed.

Field observations on the actual condition of the equipment used are out-dated, significantly deteriorated and do not provide reliable hydrological data. All of the gauging equipment need urgent replacement.



Photos from Akhuryan-Akhurik transboundary hydrological observation post

III. Deliverables

Act of shipment of the following equipment and software package to the Armenian State
Hydrometeorology and Monitoring Service of the Ministry of Emergency Situations of Armenia

Description	Quantity	Unit	Price, EUR
1. Automated hydrological complex (level meter/water gage) with radar logger			
Radar logger SEBAPuls 15 with holders	1	piece	
Cable for radar logger	10	m	
SEBA UnilogCom controller with built-in GSM/GPRS modem	1	piece	
Standard pin antenna with GSM/GPRS modem	1	piece	
Assembling board	1	piece	
Power distributor with fastening on DIN-ruler, with clamps and cables	1	piece	
Protection from high voltage	2	piece	
Adjustment cable for SEBA logger – HDA/PC/Laptop	1	piece	
<i>Sub-total (1)</i>			
2. Software package			
Software package SEBA Config	1		
Access to SEBA-Hydrocentre	1		
<i>Sub-total (2)</i>			
3. Freight shipment			
Shipment of the equipment and software package to Yerevan, Armenia	1		
<i>Sub-total (3)</i>			
GRAND TOTAL			

IV. Timeframe and payment schedule

The duration of the assignment is up to **2 months**, and the maximum budget of the assignment is **6,200 EUR**. The expected commencement of the assignment is April 15, 2016 and the completion date is June 15, 2016 the latest.

The tranches made will be subject to acceptance of the tasks according to the following breakdown:

- 20% upon signature of the contract,
- 80% upon shipment of the equipment.

V. Reporting

The contractor shall report to the project TL, Timothy Turner regarding progress of works and to the Country Water Management Expert Vahagn Tonoyan, for all day-to-day management issues.