

## **Summary Stage II**

In the second stage of the project, the second part of the design of the conceptual model of the laser-based experimental system for the detection of microplastic in water was performed, namely, the microfluidic subsystem, determining the critical parameters and quality attributes to be followed in the development of this subsystem. Chemical, optical and spectral analysis of the selected samples was performed. In order to proceed with the implementation of the entire experimental device, the concept of the Raman scattering subsystem was updated, improved with data recently published in the literature and the technical characteristics of the equipment to be purchased were established, namely an Echelle spectrograph that simultaneously offers high spectral resolution and high spectral bandwidth. Experimental assembly of Raman spectroscopy was performed, constant droplets with microliter domain volumes were generated from liquid stock samples of different microplastic concentrations of different sizes. Measurements of laser radiation interaction with droplet samples were performed by Raman spectroscopy, as well as qualitative/quantitative analysis based on the collected Raman spectra. Attempts were made to optimize the working parameters (from an optical, detection, microfluidic, optofluidic point of view) and the team analyzed the risks as well as the reassessment of possible future risks.