



## **Industrial water use and related environmental concerns in the Gebze Industrial Area**

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Land-based pollution generated mainly by industrial and domestic pollution in Izmit Bay, a semi-enclosed bay located to the Eastern part of the Marmara Sea (an inland sea) has been an environmental management concern since the 1970's due to heavy industrialization and population increase on the coastal zone and hinterland of the Bay. A field study comprising industrial inventory and marine water quality has been carried out. The objective was to determine the total water demand of the industrial premises located in the industrial areas of Gebze, Dilovası and Çayırova, to estimate the water demand variations and sources of utilization (municipal network, groundwater or tanker) in accordance with the capacity utilization rate changes of the industries and to identify the potential of environmental stress generated by these activities both on fresh water resources and the marine environment.

During the field study, after having obtained the required authorization by the institutions concerned, pre-scheduled appointments were made with the nominated staff by the companies and face to face interviews were carried out with a structured questionnaire. Out of 686, 229 representative companies were sampled. In addition, fifty large companies were analyzed separately within the sample of 98 which are determined as "large-size" companies by the industrial chamber of commerce of the corresponding province "Kocaeli". All the data collected were statistically analyzed by using the "Quantum" computer program and the detailed statistical output results were obtained. The total water consumption of these 50 companies was computed and the related industrial categorization according to the "Water Pollution Control Regulations" of the "Environment Act" was made.

The operational practices of the existing wastewater treatment plants run by the industries, the pollution potential in the Dilderesi Creek and the shoreline of the study area were assessed at six representative stations. The analyses were carried out with a HACH DR-2400 spectrophotometer and also at the laboratory of the Institute of Marine Sciences and Management.

The findings of the field survey at the industries and analyses of the samples have proven that the study area is subject to a severe environmental stress both with regard to fresh water resources and also with regard to the pollution of the receiving media. Overexploitation of the freshwater resources and the pollution of the marine environment mainly by industrial discharges are the two most important problems in the study area.

Present and previous studies recommend that an integrated environmental study covering the identification of industrial pollution at source should be initiated on a basis of regular monitoring. This approach will help to start a comprehensive industrial pollution abatement program on a voluntary agreement basis by the industrial premises; associated with other stakeholders and supported by central and local authorities concerned.