

Multi-disciplinary Approach for the Environmental Analysis of Surface Waters in a Large-scale Development

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SUMMARY

The design of large –scale, integrated projects, developed within the principles of sustainable development, needs to ensure that special measures are incorporated in the project design, and operations management for the protection and preservation of natural environment. Parameters such as soils, landscape, water resources, habitat types flora and fauna are analytically examined during the initial project stages and the major conclusions on the existing environmental status provide the basis for selecting the site location, and developing the subsequent steps of the project design.

Within this framework, the methodology developed for the protection of surface water streams and their ecology in a large-scale tourist project in Southern Greece is presented in this study. The wider area examined amounted to 3,000 ha, with the proposed buildings footprint corresponding to less than 1% of this area. A multidisciplinary team of experts including photogrammetrists, hydrologists, environmentalists, and GIS experts worked together to collect, integrate, and synthesize information and data on the land morphology and the management of the surface waters (watersheds, creeks) encountered in the study area. Hydrological, hydro geological and environmental analysis methods were used in parallel to define the size of the watersheds recorded in the area and their respective ecological significance.

The methodology developed and the resulting digital map product superimposed on orthophotos of the area, along with soil data, hydrological models, and ecological field observations provided the tool for the analysis of the surface water environmental regime in the wider project area. The delineation zones of the major creeks that need to be excluded from any development in order to protect the uninhibited surface waters flow and the ecology of the areas adjacent to the creeks were determined.

This methodology, integrating the expertise of various geo information and environmental technology disciplines, can be used as a generic tool in the design and management of large – scale sustainable developments such as land planning and urban development schemes, integrated tourist development, mining and quarrying and other infrastructure projects.