

DATA BASE FOR WASTEWATER REUSE PROJECTS

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ABSTRACT

The current and future lines of water resources planning and management incorporate wastewater reuse as a fundamental tool to satisfy water demands and to respect the environment. Implantation of this kind of projects is tied to scientific and technological development of water regeneration processes, as well as to estimation of sanitary risks that can entail regenerated water use. In this framework, an accurate follow-up of water regeneration plants representative of the entire territory is brought up. One of the aims of this follow-up is to gauge the obtained quality according to the applied processes, considering which of the parameters of water quality better represent sanitary risk.

The regenerated water quality follow-up is carried out from an accurate qualitative analysis generating a great amount of data. The generated information has to be available for all the actors who participate in it: management agents, operators and investigatory scientists. This situation makes it necessary to group all the information into a database which could be available in separate locations. The main objective of the database is to orderly store all generated data of reuse projects and to make it accessible in an easy and safe way.

The first step to the conformation the database is classifying the information that has to be stored. The dependences among different data define the data grouping, the ways to correlate the tables. For example, the processes of regeneration depend on a concrete project and the points of sampling depend on these processes. However, other characteristics, like the year when the project was implanted, they do not depend on any other data apart from the name of the project itself. Grouping the information is related with the temporary dependence of data; the effluent quality and the treated flow quantity dependent on the time; however, the other project characteristics are not influenced by the moment of compiling data.

Apart from the ordered storage of data that offers the database, it also aims the systematic processing of quality data, simplifying the operation of each one of the regeneration plants. In this way, when the quality data has been introduced they has to be analyzed. The database allows exporting these results to other programs, where they could be graphical and numerical interpreted.

The database elaborated in this dissertation contemplates eleven water regeneration projects managed by the Consortium of the Brave Coast and the project of Mataró. This dissertation incorporates a graphical study of bacterial and viral indicators evolution and of the turbidity in the Castell Platja d'Aro tertiary. This project, like all the others in this zone, has a differentiated behaviour in summer than and in winter. In the warmth period the amount of flow and its pollution increase. A sand filter and two disinfections, the first with light UV and the second with chlorine compose the analyzed tertiary.

The efficiency of the disinfection with light UV is influenced by several parameters; it depend first on the affluent transmittance. However, a good correlation between the turbidity in the water and the efficiency provided by this process of disinfection can not be established. The UV disinfection inactivates better the somatics than the bacterial indicators. The inactivation of viral indicator is bigger with UV disinfection than with chlorine disinfection.

All regeneration process of this plant, especially both disinfection processes, it provides good quality water to the effluent. The obtained results are lower than recommended limits to irrigate golf fields and gardens.

Managing wastewater regeneration projects with a database like the one proposed here is fast and efficient. This tool is suitable to share information between the different participant agents in the projects. The applications provided by the data base speed up the results extraction and help to the statistical analyse of data and graph. Summarizing, the data base is an efficient tool to determine quality parameters that facilitate a reliable implantation of water reuse projects.