

# Resum de Tesi Doctoral



Oficina de Doctorat  
UNIVERSITAT POLITÈCNICA DE CATALUNYA

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Títol de la tesi	Estudio de la viabilidad técnico-económica y ambiental de la gestión de fangos EDAR por adición de			
Unitat estructural	Ingeniería Química-ETSEIB			
Programa	Enginyeria Ambiental			
Codis UNESCO	330300	330810	530602	530301

(Mínim 1 i màxim 4, podeu veure els codis a [http://doctorat.upc.edu/doc/impresos/impres\\_codunesco2.pdf](http://doctorat.upc.edu/doc/impresos/impres_codunesco2.pdf))

## Resum de la tesi de 4000 caràcters màxim (si supera els 4000 es tallarà automàticament)

Urban wastewater treatment plants produce a variety of residuals during their operation, the typology of which are in function of the design of the treatment process. The problem aborded in the present thesis refers to the sludge produced as a result of the treatment.

After the banning of disposal to continental and/or marine waters, established at the EU through Directive 91/271 CEE and then in Spain trough Royal Decree [RD 11/95] those sludges should be object, essentially after treatment, of controlled using or disposition.

Previously to the using or disposition a previous treatment can be required, that could be organic (essentially composting with other amendments), drying or other physic-chemical treatment, between those last alkaline stabilization. Alkaline stabilization can accomplish on a single step reduction or elimination of pathogen vectors, smell elimination and a reduction in the putrefaction potential. Its base is the alteration of the physic-chemical characteristics of the environment of the sludge by addition of alkaline material.

One of the processes of inertization, object of the analysis proposed in the present thesis, is the treatment realized trough addition of calcium oxide. Essentially it is a physic-chemical treatment trough which it is possible to obtain a dry product with the addition of calcium oxide (quicklime) to the urban wastewater sludge. The result of the chemical reactions and water evaporation is oriented to obtain a dry product (10% humidity) as powder and with a reduction of mass in relation to the original wastewater sludge of about 40%.

The realized work have been developed over the basis of the analysis of the technical, economical and environmental feasibility of the proposed alternative, using though normalized methodology on each of the different concrete aspects that are developed. A very important part of the experimental work which validates the technology under study has been developed at pilot plant level. Additionally, the proposed management alternative of the sludge includes using the inertized sludge as a secondary raw material in Portland cement clinker production, having been developed a industrial pilot test to validate the theoretical hypothesis been established.

The thesis has been developed in the core of task 6b of Project Sostaqua in program CENIT, promoted by the Centro para el Desarrollo Tecnológico e Industrial (CDTI). This had as an objective the creation of new knowledge to contribute to the development of a sustainable water life cycle. Being the sludge part of that cycle, task 6b has intended demonstrate the feasibility of the treatment with addition of alkaline agents, in this case with addition of calcium oxide.

Over the basis of the obtained results it has been considered that the proposed process constitutes a feasible alternative to the management of the urban wastewater sludge. Considering that this management it is a difficult task to abroad, due to the technical difficulties implied, it should be convenient to diversify the alternatives in order to have backup treatment capacity in order to avoid the final disposition to landfill.

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