CONSTRUCTED WETLAND FOR WASTEWATER TREATMENT OF DICOMANO

ORIGINAL NEED

This project started by a Feasibility Study by ARPAT on commission of "Comunità Montana del Mugello, Alto Mugello e Val di Sieve" in 1997. Wastewaters produced by the whole Dicomano settlement (3.500 p.e.) are treated. This multi-stage plant is working since september 2003. At the moment, it is the biggest secondary treatment Constructed Wetland system in Italy.

LOCATION
Municipality of Dicomano
Province of Florence
Tuscany
Italy

COMMITTANT
Municipality of Dicomano

NUMBER OF PERSON EQUIVALENT
3500

WASTEWATER TYPOLOGY
Urban

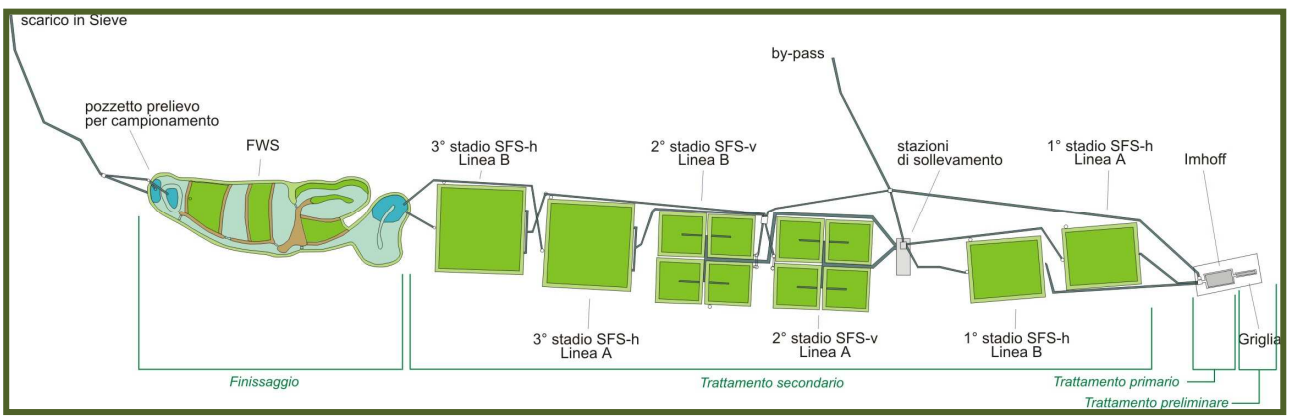
PLANT TYPOLOGY
SFS-h + SFS-v + SFS-h + FWS

AREA (M2)
total 6080 (1000 + 1680 + 1800 + 1600)

YEAR OF REALIZATION
2003

DESCRIPTION

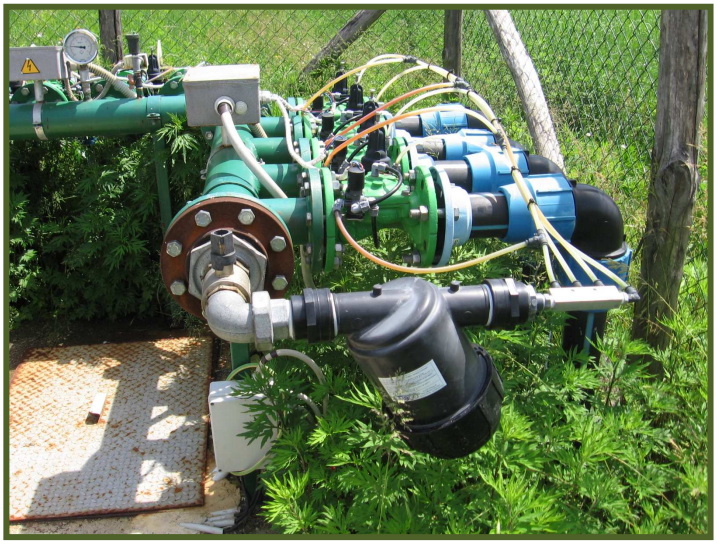
The wastewater, after a primary treatment, flows into an horizontal subsurface flow system as secondary treatment (1 st stage), then into a vertical subsurface flow system (2 nd stage) and into an horizontal subsurface flow system again (3 rd stage). At least, wastewater is received by a free water system as a tertiary treatment (4 th stage). The free water system is used as polishing stage. It is conceived in order to obtain a high-biodiversity area (16 Tuscany's autoctone species of vegetation have been planted).



Block scheme of the plant

The hydraulic loading (considering the sewage restitution coefficient) has been fixed at 150 lt/p.e. per day: the plant will treat 525 m 3 of wastewater per day, in average.

The organic load considered in the design has been based on the results obtained in a former analyses campaign of wastewater produced by urban settlements in the project area and has been fixed at 140 mg/l (BOD 5); inlet Ammonia concentration has been assumed as 35 mg/l. Minimal winter wastewater temperature has been conservatively fixed as 6°C.



This system configuration is able to perform a good nitrogen removal, especially during summer, when the receiving water body has the lowest flow, and achieves the purification targets required by the italian law (D.L. 152/99).

Technical Details (surface area):

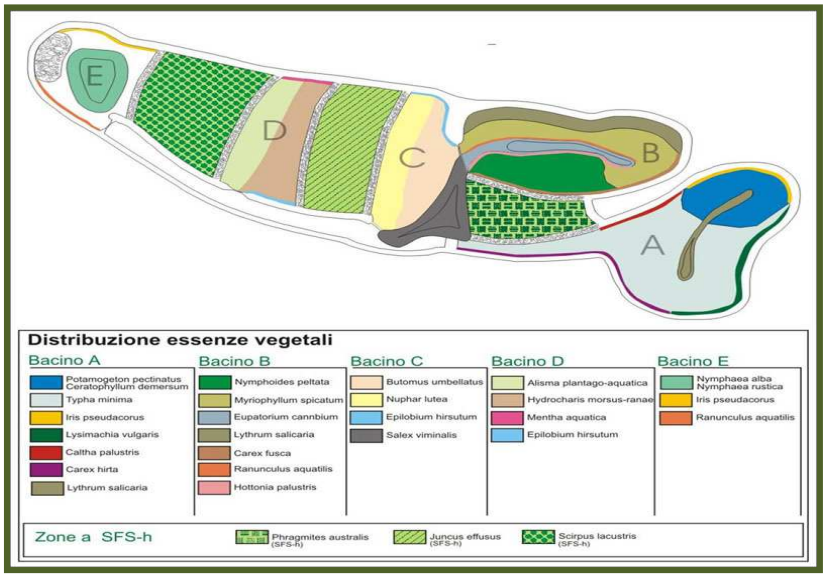
1° stage	**1000 m2**
2° stage	1680 m2
3° stage	1800 m2
4° stage	1600 m2
Total	6080 m2

During winter time (the most critical period) the forecasted outlet features are:

- BOD 5 20 mgO 2 /lt
- N-tot 13 mg/lt N
- SST 10 mg/l

COST

Dicomano Constructed Wetlands treatment plant has been partially financed under the CEE – LEADER II program. Its realization, including pipeline connections needed 1 year of works. Its costs have been about Euro 550,000.00 and for its maintenance Euro 20,000.00 will be payed yearly.



Vegetation species in the Free Water System

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