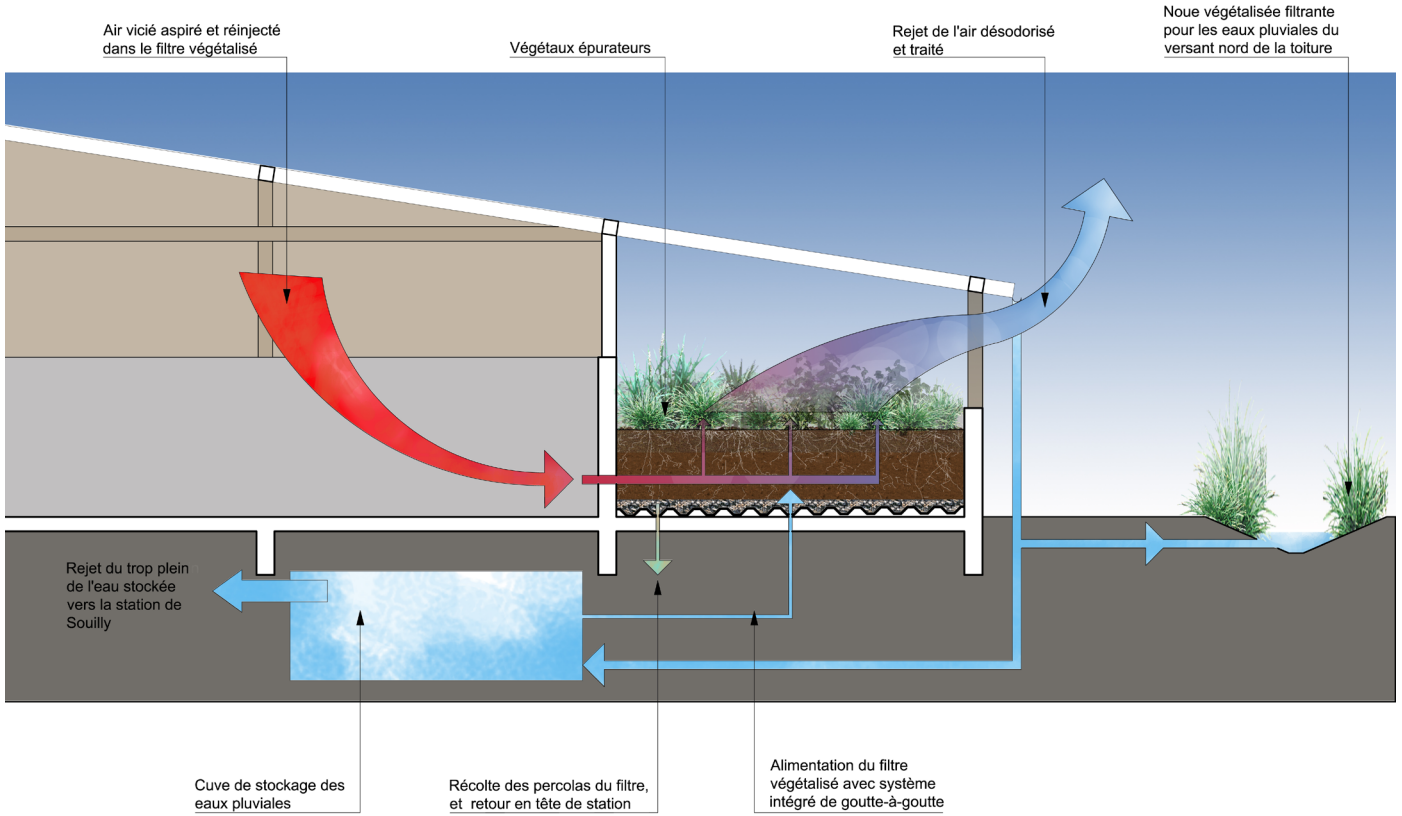
eco-design of a sludge storage shed in Souilly - France

industrial site, HQE approach: waste treatment story

client	City of Claye-Souilly
location	Claye-Souilly
project	Design and build
mission	Design concept and follow up mission, architecture HQE® and landscaping
design and built	AR ARCHITECTES, Degrémont Suez, ZUB, PINTO
area	2 500 m²
capacity	72 000m3/h (polluted air)
cost	1 500 000 €
date	May 2011

View on the terminated project



Air treatment integrated into the sludge storage shed is partially made of reinforced concrete with partition walls 2,20m high. Above this height, a galvanised metal structure holds a larch wood cladding and translucent polycarbonate siding materials. On the south side of the works there is a green planted filter with a surface of 135 m² it treats 72 000 m3/h of polluted air coming out from the 2 500 m² storage shed.

View on the structure of the construction

Treatment of 72 000 m3/hour on an area of 135 m² of green planted filter

Polluants	Concentrations (mg/m3)	Objectifs à atteindre (mg/m3)
Ammoniac (NH_3)	6,5	0,7
Amines (R-NH)	N.C	0,1
Hydrogène sulfuré (H_2S)	0,05	0,1
Mercaptans (R-SH)	0,013	0,05

N.C. : Non communiqué

Board 1: Pollution treatment

Débit (m3/h)	72 000
Profondeur du lit filtrant (m)	1,1
Temps de résidence minimal de l'air dans le filtre (s)	7,425
Volume du lit filtrant (m_3)	148,5
Surface du lit filtrant (m^2)	135
Longueur du biofiltre (m)	30
Largeur du biofiltre (m)	4,5

Board 2: Biofiltre caracteristics

The biofiltration is a technology used to treat polluted air with high concentrations in ammoniac type (chap) (NH3) and hydrogen sulphide (H2S).
The biofiltration has many advantages comparing to chemical-physical air filtration. It is economical and ecological.

Treatment by biofiltration takes place in two stages:
- 1st stage : pollutants settles on the recovering substratum.
- 2nd stage: microorganisms biodegrades the pollutants. Plants absorb the products that serve to regulate its microbial growth.

The biofilter integrates a water management system which has two objectives:
- Irrigation and filtration of plants

HQE® targets

Target 5: water management

• The domestic hot water is warmed by the thermal solar panels. Its surface is 2 to 3m ²
A tank of storage of 300L allows to produce 100 to 150L of warm water per day, that is 100 % of the consumption of two persons.There's an economy of 300 to 450€ per year.

• The annual water consumption is estimated approximately to 300 L/m ² for the irrigation, according to climatic conditions, that are approximately 40m3 per year.

Target 13: air management

• The design of the biofilter for air treatment presents numerous advantages:

- Uses zero chemicals.

- Treatment of polluted air by the plants creates zero impact on the surrounding inhabitants.

- Landscaped integration.

- Low and easy maintenance.

- Economical comparing to other high energy consuming treatments.