

CASE STUDY: Storm water management –“Porte des Alpes” site in the Lyon (France) suburbs

SECTOR : Water
COUNTRY: France

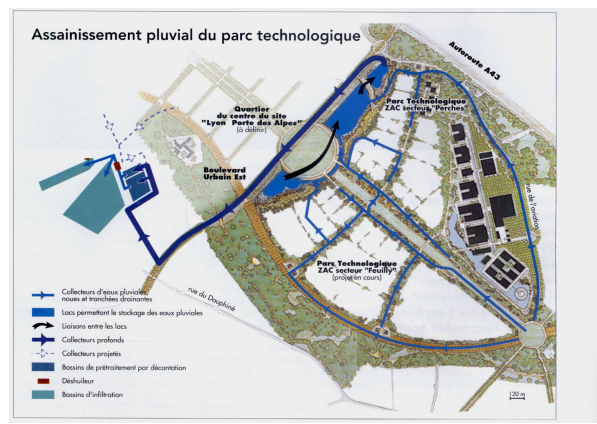
BACKGROUND

The “Portes des Alpes” site is one of Greater Lyon’s biggest projects. It is a 230 hectare business area to the east of the city. The site has good road, motorway and tramway access and is not far from rail stations and the airports. The major drainage questions concern (i) saturation of downstream combined sewer networks both immediately adjoining the area and for the planned south-east Lyon region plateau main sewer, and (ii) relatively low soil permeability over most of the area. Furthermore, there are environmental requirements as to conservation of the groundwater, which is considered as a second resource supply for the Lyon conurbation. Ongoing estate development also involves various economic conditions (the first stage has been completed since 1997, and the second and third stages are respectively planned for 2002 and 2003).

The solution which has been adopted is to hold back the water and drain it towards areas where the permeability allows infiltration, favouring a short stormwater cycle. The choice and design of the retention and infiltration systems was made at the beginning of the urban project. The decision was to make use of certain retention systems as lakes (3 for 4 hectares), the upstream drainage system being composed of trenches and swales. The infiltration systems are composed of infiltration ditches, backed up, in case of heavy rainfall, by football fields. The lasting of the technical solutions and of their use is ensured in various ways: pre-treatment of effluents from polluted areas (roads, car-parks, etc.), purification facilities upstream of the lakes, ecological monitoring of the

lakes and minimal disturbance of other types of use.

Over and above this and in-lake purification by decanting and by purification via plant and fauna life, the groundwater receiving the infiltration-water is to be conserved by soil filtering. Water and soil are planned to be monitored.



EVALUATION

Evaluation will be carried out by means of scheduled observation:

- groundwater monitoring, in accordance with water policy instructions: quarterly analysis (i) of effluent (BOD, COD, NK, and hydrocarbons), (ii) of groundwater (conductivity, COT, NK, nitrates, hydrocarbons, nitrate pesticides and heavy metals);
- infiltration area soil monitoring by 50 cm sampling and analysis (heavy metals, chloride solvents, hydrocarbons, pH and COT);

- lake purification (input and output) assessment: an observatory is being set up for 2002;
- lake ecology monitoring: report, monitoring protocol and plans for preventive and corrective action.

BENCHMARK DATA

Not national groundwater conservation norms, but a discharge consent decree from water policy. Design guide for drainage and leisure equipment.

DRIVERS

Greater Lyon (various departments) is the driver. The partners are neighbouring municipalities, university campuses, shopping centre, and the Sytral (public transport organisation).

LESSONS LEARNED

The “Porte des Alpes” drainage system has been integrated by highly upstream collaboration with developers, with early involvement of landscapers; drainage system multi-functionality, to provide quality public spaces; “water culture”, by communication, to ensure system sustainability; planned integrated management by involvement of the various actors concerned by a single location, as of the design stage; a single management cell, following definition of responsibilities of those concerned.

APPLICATION

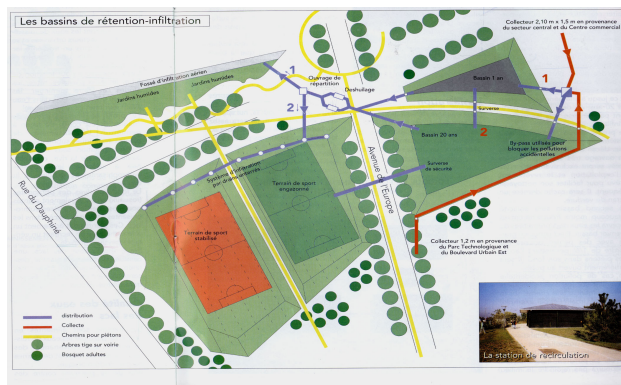
The project is site-specific, so that application elsewhere concerns only methods, undertakings and feedback.

TRANSFERABILITY

- Drainage systems open to the public, supporting other functions (decorative, leisure, sport, etc.).
- Drainage design at the beginning of urban project conception.

- “Cascade” management of flood risk: nearby structures to manage normal rainfall (swales and trenches upstream of lakes, settling tank downstream of industrial estate for annual rainfall) so as to better treat effluent and also minimise impact on multifunctional infrastructure (lakes, football fields, etc.)

Single management cell (multiple use entails multiple partners) integrating all those involved, with respective fields of competence pre-defined.



IMPACT ON SUSTAINABILITY AREAS

Environmental

On-site run-off water infiltration- i.e., without downstream network connection- does not increase combined sewer overflow and thus preserves the receiving water. Moreover it does not increase the amount of storm water directed to the treatment plant. This solution further ensures groundwater feed-in while minimising pollution risks via various treatment methods. Groundwater monitoring is, it is to be borne in mind, planned for. This solution set up an artificial ecosystem –the lakes- that allows enhancement of the landscape.

Social

Public involvement in the project came only in the form of public enquiries. On the other hand, the extra uses of the drainage systems (with 90% open over 18 hectares) are intended for the general public (lakeside walkways, cycle track, football fields, etc.). Certain “users” will

take part in upkeep (the University as far as the football fields are concerned, for example). School visits for the neighbouring communities are planned to raise consciousness regarding water and its management. The permanent on-site caretaker will be available for visitors' comments and questions.

Economic

Given the specific features of the area (topography and pre-existing network), the solution is low-cost compared to fully connected alternatives. Moreover, co-ordinating drainage with other site works has generated savings. System multi-functionality enabled outside financing to be sought. Data is as yet lacking to validate estimated operating costs. Furthermore, landscaping enhances the site, making it more attractive to firms considering setting up there;

Institutional

- Involvement of various specialists (technicians, planners, etc.) in the design.
- Single management cell co-ordinating pre-defined monitoring and maintenance partners.

PROJECT CONTACT

Ms Elisabeth SIBEUD
Grand LYON (Communauté Urbaine de Lyon)
Direction de l'Eau
83, cours de la Liberté
69 000 Lyon
tel.: (+33) -4 78 95 89 30; fax (+33) -4 78 89 74; e-mail:esibeud@grandlyon.org

www.grandlyon.com/projets/