

Report of Similar Groups

Table A- environmental officials of a City

Leader: Erik Mertens – City of Mortsel – Belgium
– Julien Correa – Grand Lyon – France
– Stephanie Godon – Ville de Paris – France
– Philippe Janel – Drieë IDF – France
– Mucig Charlotte – CETE/LRPC de Nancy – France
– Bernard Lemaire – IBGE – BIM – Belgium

1. **Cities don't have the financial capacity to handle large historical pollution's. Do you think the cities have to wait until private polluters or the federal state starts to tackle this pollution?**

The attendees of this discussion group come from France or Belgium and Soil investigations and remediations are in these countries organised on regional level. So cities or communities don't have much influence on this remediation process or on the information that is gathered by the research or the remediation. Cities always have to appeal to the regional authorities when they want to solve a problem of soil contamination.

2. **Do you think it is better to wait with communicating until you are sure how big the problem is or do you think it is better to inform the inhabitants from the moment you now there is a problem?**

It is better to wait with communication to the press and the habitants until the dimensions and the gravity of the contamination is known, so after the characterisation phase. But some other attendees found it better to give answers in a pro-active way to be sure the habitants don't hear it from other parties.

3. **Do you think it is the task of the environmental officer of the cities to inform the urban planner of all polluted sites in their city so he can use this information in the future urban planning?**

The inventory of all contaminated sites has the highest priority for all attendees of this discussion group. This can be done on the base of the environmental permissions and it is for most regions already done. The urban planners already use those lists.

Table B- Legal Advisors:

Attendees:
– Leader: Benoît Hazebrouck – Ineris
– Darmendrail Dominique -COMMON FORUM ON CONTAMINATED LAND IN EUROPE- France
– Chapron Guillaume – ADEME France
– Marmo Luca – European Commission – France
– Vergnerie Marie-Léonie - WINSTON & STRAWN – France
– Hardon Nicole- AgencyNL SOIL+ - NETHERLANDS
– Haemels Sindy – OVAM – Belgium

Question 1&2. How can we define the (liability) share of a problem-owner in the total pollution? How to organise legally an area-oriented approach? Who can take the lead for the measures over the whole area? Who bares what responsibility?

For old contaminated sites taken over by the State, the situation is legally easy: the State takes the lead and the responsibility (Belgium for sites before 1995, NL for sites before 1987, 1993, depending on the case).

For other cases: if the pollution outside the sites is mixed, the problem owners are linked by a « solidarity» facing the pollution: they have to find a settlement together to decide, pay, receive and transmit to the administration, for the studies or the cleanup. The default share is 50% for 2, 33% for three, etc. But each one works alone on its site. In NL, if some problem owners are unknown or have no money, the State can take their place, and also then take the lead and get reimbursed by the known problem owners. In France, the “personal responsibility” of a problem owner can not be taken over by the State, even when the State works on the site through the public Agency in charge of orphan sites, ADEME.

The Common Forum has proposed a definition of an “area” in its document on Risk based land management. It proposed as public leader: the town for a context of contaminated sites; the river basin for a “water mass” according to the WFD.

3. What solutions for this problem should the EU Water Directive and Soil Framework Directive offer?

The demand to the EU would be a better comprehension of some important details of the Directive: if the quality of the water is not supposed to decrease, does it mean that no plume should move even one meter forward? And that no increase should be possible within a plume? This is hardly achievable for a contaminated site: some variations of the plume are generally observed: some local increases at one place combined with some decrease at another place, without necessarily any increased threat for the uses.

Table C: Communication experts

Attendees:

- **Leader:** Patrick Krul
- FAURANT Jean-Frédéric VIALAUDIS France
- GIER Melanie – ITVA – Germany
- LETHIELLEUX Laurence – INERIS – France
- VANDEKERKHOF Renaat HOGESCHOOL LESSIUS MECHELEN Belgium
- WILLEMS Gert STAD MORTSEL Belgium

Communication should be transparent, define who is responsible for communication and find out what target groups want, to hear them and provide this information.

Table D: Policy Makers:

Attendees:

- **Leader:** Jiska Verhulst – Belgium -OVAM
- Chris Balouet – France – Environment International
- Pierre Delcour – France – Cete Nord-Picardie
- Manuel Marcoux – France – Instit. De Mécanique de Fluides de Toulouse
- Emmanuel Mousset – France – Université de Paris-Est
- Ni Zhuobiao – Netherlands – Wageningen Universiteit

Question: what should be concrete outputs of WP4 CityChlor?

Discussion: the output should be

- changing of legislation;
- a clear approach that can be used by policy makers;
- a website with gathered information
- a user guide containing different aspects for different target groups; this should be structured in such a way that every target group easily can find the condensed information.

Important topics:

The output should be adaptable also after closing of the project;

The output should be open for suggestions (someone also suggested to build in a "suggestion box" on the website); eg new techniques can easily be taken up;

The output should be state of the art;

CityChlor should first of all serve as a connecting network

Important "problem":

-The gap between universities and people on the field on one site and policy makers on the other site: new ideas and techniques are too little taken up by policy makers; CityChlor should be helping bridging this gap;

Suggestion:

Someone suggested FLUXOBAT in France; this investigation programme seems to investigate the same aspect as taken into account in CityChlor.

Table E (TECHNICAL EXPERTS 1)

– Leader: Albert De Vries – Utrecht – Netherlands
– BLESSING Michaëla –BRGM- France
– GOUDESEUNE Eric - ENVIROSOIL N.V.- Belgium
– JARDIN Stephanie –Brezillon- France
– JOUBERT Antoine –SERPOL- France
– MALANDAIN Cédric - ENOVEO – France
– MEYER Armin -ISODETECT – Germany
– SECKER Marcel CITY OF STUTTGART Germany
– THIAM Amadou INERIS France

Question: What experience do you have with characterisation tools? In CityChlor we will test passive samplers, Direct Push Technology, Membrane Interface Probe, and some other innovative techniques. Which other techniques do we have to study too? What do you expect of the guidelines and codes of good practice? Are there differences in the 4 countries?

- CityChlor has made a good selection in innovative techniques.
- In guidelines we expect to see what technique can be used in which situation + in which situation it isn't suitable. But also how many efforts we still have to make in 'classical' soil and groundwater samples.

Output for CityChlor

- Databank of sites with VOC (successfully remediated as well as not successfully ended and the reasons why) and the possibility to search for similar sites so we can learn from the experience of the other countries.
- Guides for research and remediation that form a platform of experiences so we don't make the same mistakes.
- A search or filter should make this tool really useful.

Table F: TECHNICAL EXPERTS 2:

Attendees:
- Leader: Bert Van Goidsenhoven – OVAM – Belgium
- Bruno Fricaudet – BFR Ex Poll- France
- David Hiez – Tauw - France
- Philippe Oudin – Semaco – France
- Sacchetti Lorenzo – Carus Corporation – Italy
- Robert-Jan Stuut- MWH Global – Netherlands
- André Tartre – Wesa Envir-eau – Canada
- Frank Wickert – Guc-Seceg - Germany

What are the main barriers for the implementation of new techniques?

- The consideration of the classic techniques as reference is wrong as they their deficiencies.
- A critical attitude against laboratory analysis is necessary, often a lab result is considered as indisputably
- Classic methods are easier to explain to principals and hence more easily accepted
- Contractors should also be open in the disadvantages of new techniques
- A technique is useless if not being applied by a competent person
- There is a gap between scientific acceptance and acceptance between the authorities/administrative level
- Only pilots on own sites are accepted as proof (even in France, where there is sometimes mistrust towards pilots in other regions of the country)

Table G: TECHNICAL EXPERTS 3:

Attendees:

Leader: Claire Rollin – Ineris – France

- Büiring Stucki Gabriele – Chloronet – Switzerland
- De Cock Carl – Haskoning – France
- Van Hal Hannelore – Sertius- Belgium
- Jardin Stephanie – Brezillon – France
- Malandain Cédric – Enoveo – France
- Wemmekes PN – Bosatex - Netherlands

What problems did occur in your Voc-remediation project that were not mentioned in CityChlor?

France: What to do with small companies with no legal framework (less restrictive regulation). Small quantities used and no remediation performed.

In Switzerland: There is a register.

In Holland: last year, the government paid 50 % of average for small companies. Pay contribution fee (similar to Vlabotex)

What to do with low concentrations (when source is gone) when no natural attenuation is present. Risk is still present. In France, use is in agreement with the concentrations and you monitor.

When source cannot be reached: no legal action if you cannot reach it and if no real problems (you have to keep the memory). Economic balance, case by case. You can also cut the way of transfer. Environmental risk is in the centre.

In Switzerland, the way of investigation 25 years ago is different than today. So there are still problems in these sites. New investigations are needed. The cantonal authority decides to go back to investigations. Ownership can ask for help.

Problems worse due to investigations done not properly. Who is responsible for the new pollution (for example caused by drilling badly).

Legislation is really a difficulty. Local authorities change often: many different persons.

No remediation of the plume in Switzerland.

Netherlands: definition of what is a source (standards) and what is a plume.

Table H: TECHNICAL EXPERTS 4:

Attendees:

Leader: Fabrice Quiot – Ineris – France

- CEDOU Claude -BREZILLON -France
- ESNAULT FILET Annette -SOLETANCHE BACHY- France
- FLUM Manfred -VILLIGER - SYSTEMTECHNIK AG – Germany
- GIER Sabine – ITVA- Germany
- MOURIOT Florent BREZILLON France
- VERVAEKE Pieter ENVISAN NV Belgium

How can you convince principals that more intensive (and expensive) surveys lead to more efficient remediation projects?

The discussion began with the need to have enough data to have sufficient knowledge of the site and the situation (completion of a preliminary conceptual model), in order to effectively manage the pollution potential (assessment costs / benefits). Uncertainties must be minimized so that the case be accepted by the administration. Two other arguments have been raised: the owner's responsibility and the pressure of population / communication (the image of the company towards the public).

Table I: TECHNICAL EXPERTS 5:

Attendees:			
– Leader: Franck Le Moing			
Natalie CABITZA	City of Stuttgart	Environmental official City	Germany
Sébastien DENYS	INERIS	Other	France
Christine VAN TRICHT	OVAM	Other	Flanders
Gilles MICHELINO	Agri Environnement	Contractor	France
David CARPENTIER	Agri Environnement	Contractor	France
Daniel HUBE	BRGM	Remediation expert	France

“When remediate the source zone, do you think it is still necessary to tackle the plume too? Is monitoring enough or leaves this a huge burden on the following generations? How can you control the further spreading of the plume?”

Summary of the discussions:

First, all experts totally agreed on the fact that source has to be removed/treated.

There are many questions implied in these sentences.

“When remediate the source zone, do you think it is still necessary to tackle the plume too?”

It heavily depends on risks and thus on concentrations in soils and groundwater and therefore in terms of risk exposure (exposure levels). Obviously, if concentrations are high, you have to treat actively the plume in order to avoid any exposure.

If concentrations are low, a passive treatment (as MNA) can be considered. But before choosing between monitoring and another active treatment, we have to ask the following question: *“What is the limit of residual pollution we leave?”*

And to answer to this question, we have to take these points into account:

- Aquifer’s mobility;
- Urban pressure (today and tomorrow);
- Social kind and community involvement (we have to show that residual pollution is very low);
- People more sensitive to pollutant;

“Is monitoring enough or leaves this a huge burden on the following generations?”

We must be clear: monitoring is not a treatment. In this question, the words “burden for following generation” actually deal with notion of “time dimension” and the fact that **we must anticipate evolution** concerning:

- **The urban development and pressure**

A long-time monitoring can be incompatible with urban time-scale (projects, demand for houses, changes of the soil use...). Thus, MNA (or other planned plume remediation) has to be strongly associated to an urban project.

- **The future use of groundwater resource**

Needs for drinkable water can also evolve. We must keep in mind that groundwater resources can be prone to human consuming in the future. Therefore, a remaining pollution, compatible with current uses of the soil/groundwater (for example for offices...) can raise problems in the future if this water is designated to human consuming.

However, nowadays, we measure pollution in terms of concentrations. One suggestion made during this discussion group was the fact that we should consider pollution **in mass units**. Indeed, one concentration punctually measured shows low level leads to a favourable risk assessment. Situation could be different if you think in terms of mass. In fact, the total of one pollutant mass on a first site plus a second one on another site...and so on could lead to different conclusions. We must take into account the fact that total mass remaining in the soil could be used in the future for drinkable water production.

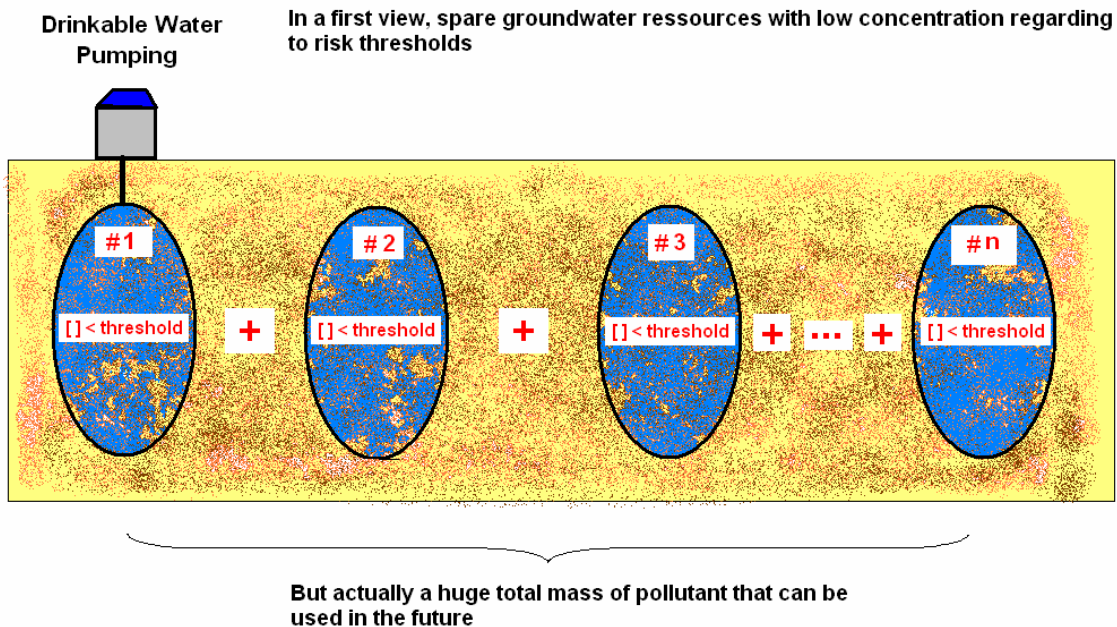


Figure 1: Think in terms of mass could be better.

- **Evolution of pollutants in soils and groundwater**

Lacks still exist in models so that it is impossible to forecast evolution of metabolites for several years. Nowadays, our main limit is the fact that we are not able to forecast this evolution. There is a real lack in modelling concerning behaviour of VOCs compounds and their degradation into metabolites (e.g. CV).

- **Cost-benefit aspects**

Monitoring can look like a seducing proposal for industrials because it implies much less expensive actions in a short time-scale. But we must be aware on the fact that a passive monitoring is not always the best option. In fact, it depends on **the time** it would take to natural attenuation to reach acceptable levels according to risk assessment (cf. plots below).

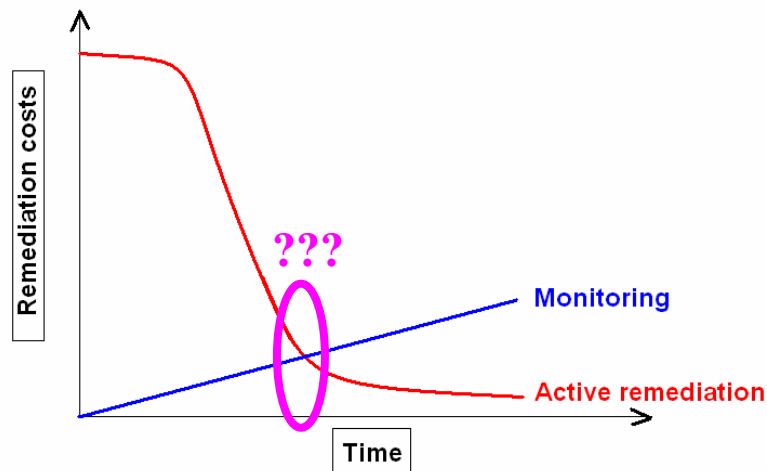


Figure 2: Active treatment Vs monitoring

- **Evolution of the knowledge**

MNA can be chosen regarding current knowledge. But this one can evolve too and these evolutions must be taken into account.

- **Community involvement**

We must show to people that measures are taken to tackle the issue of contamination in the soils.

Regarding to these aspects we should be able to choose between an active treatment (e.g. ISCO) or just monitoring for the plume.

To conclude with, leave or not the plume must be decided after balancing the two scenarios

- (1-MNA
- 2- Active treatment)

and regarding to the previous several aspects.

Table J: TECHNICAL EXPERTS 6:
- Leader: Griet Onraedt – OVAM – Belgium
- FOUCART François ENVISAN France
- KUEHNER Joachim ZÜBLIN France
- LIETEN Shakti BIOCLEAR Netherlands
- ONDREKA Joris ARCADIS Germany
- ROUSSEL Hélène ADEME France
- THANNBERGER Laurent VALGO France

Technical question nr. 10: “Iron treatment of groundwater is one innovative technique to remediate VOC pollution that will be tested by CityChlor. What is your experience with this technique and what might be the problems with this technique? Do you have solutions? What elements should we investigate and describe in our field test.”

Half of the group didn't had any experience with the injection of iron to remediate a pollution with VOC in the groundwater. The other half who had experience said to have experience with the use of the iron on **micro-scale**. The advantages were that it did last long time when it was injected in the subsoil and they pointed out a slow reactivity. They also wanted to note that they had some experience with the use of iron on nano-scale but the negative aspect of that was that it caused damage on cellular level. They also said that the iron particle had to be combined with a long term remaining *carbon source* (for example the product EHC) and that it's very important to know the *oxygen demand* of the soil before calculating the amount of iron and injections needed. Hydraulic conductivity of the soil must be sufficient and the range (the distance) between to injection point must be checked.

One of the *negative aspects* is the problem with clogging when injecting the product into a filter. Injection has to be done under high pressure. The negative side effect is fracturation of the soil (= soil hardening) (person who said that referred to the Consoil meeting, I will check the presentation to detect and learn more about the programme).

In the USA there is experience with iron to treat OC (pesticides), energetics (explosives) and VOC. In France there is experience with at least one site who got depolluted (TCE and PCE) and on labs scale there is experience with treatment of highly chlorinated pesticides.

The discussion group agreed on the fact that the best results on the treatment of VOC pollution (source zone) was with ISCO, particular the use of **persulfate** and re-infiltration afterwards (if possible). They agreed on the use of a reactive barrier to control further dispersion of the plume.

Some contacts were made and a lot of useful information will follow during the next months.

Table K: TECHNICAL EXPERTS 7:
- Leader: Peter von Schnakenburg – Stuttgart – Germany
- ALBRECHT Remy INERIS France
- DE VRIEZE Inge OVAM Belgium
- MICHEL Julien INERIS France
- OLIVER Douglas MWH USA
- PHILIPPON Florian ADEME France
- VAN DE PUTTE Wouter MAVA Belgium

Thermal treatment seems to be a good alternative for pump and treat to attack VOC pollution. Do you have any experience with the side effects? What problems may occur? In which conditions do you think this might be the best remediation technique?

The result was, that there was not much experience with this technique. Florian Philippon from ADEME sent me a contact about an appliance of a thermal treatment. Douglas Olivier made quite a good list of things to be recognised using this technique:

- Is there DNAPL below the water table?
- What about utilities/pipes?
- Will this destroy microbiological communities so that there would be no biodegradation for remaining contamination?
- What are vadose zone conditions?
- Can all vapours be contained/captured?
- Are there pathways that vapours could take and lead to vapour intrusion risk during remediation?
- Expensive, so source must be small and well characterised?
- What are vadose zone materials - could this cause shrinkage and cracking of soil leading to damage structures?

The second question was about technical question number 9:

Inge de Vrieze told me about an integral groundwater investigation Machelen, Flanders.

Table L: TECHNICAL EXPERTS 8:

– Leader: Yves Duclos – France - ADEME
– Thomas Ertel – Germany – ET Environment and Technology
– Eddy Van Dyck – Belgium – OVAM
– Bart Vanherweghe – Belgium – Agfa Gevaert
– Hervé Constantin – France - ARCADIS

Question: For your own needs, what concrete outputs / progress on characterisation and remediation do you expect for the next 3 years?

Person 1: As Industrial using VOC:

- My prior expectations are not on innovative techniques, but on **solid proven techniques** (for characterisation - where to treat? - and for remediation).
- I need some **guarantee of success** of the operation of remediation.
- need of **targets of remediation**: what limit for the remediation / **when to stop?** for economical aspect / profitability: until which cost to mitigate VOC (€/kg of VOC removed)?

Person 2: Need of new techniques that are applicable for

- authorities:
 - **acceptable results**
 - **proven results**
 - **controllable results**
- problem holders:
 - **economical feasible**
 - give results so that they **get rid of the problem**

Person 3:

- A **joint vision** how to approach CHC pollution in urban environment effectively: not only technical innovation, but also a **strategy for long term remediation**. For this, it may be supported by/with national involvement.
- For the techniques: need a **set of project reports** illustrating how powerful innovative technologies can be used.
- **Recognition of project results** by authorities (regulators) at local level.

Discussion:

Main point of the discussion dealt with the **financial guarantee** of (success of) remediation operation (even for well known techniques – as pump&treat, ...).

In the case of innovative solution, **the cost of the risk** may be shared between actors. Public involvement may be attractive for this (CityChlor project is participating of this effort).

Discussion seemed to show a difference between contracts: **[Note YD: this has to be verified]**

- in France, contractor is engaged by the results (with guarantee related to insurance policy - which cost is paid by the client)¹
- in the Netherlands, contractor is engaged by the means

¹ Testimony from international remediation group (as ARCADIS):

- new techniques arrive from North America (and are implemented first in North Europe, then France, ...);
- a pilot is paid by the problem owner to test the technical solution
- on these bases, the contractor can appreciate the risk and define targets attainable (delay / performance) to be guarantee.

Table M: Urban Planners & economical experts

Attendees:

- **Leader: Hermann Kirchholtes – Stuttgart - Germany**
- Philippe Billet – Gessol - France
- Tine Compernelle – Hasselt University – Belgium
- Sylvia Devescovi – Ville de Sevran – France
- Emilie Maheut – AFTRP – France
- El Baz Nouradine – Leefmilieu Brussel – Belgium
- Jean Paul Sulima – Sequano aménagement – France

Results:

- Urban planning may be based on constrains by contamination
- Urban development can be hindered (due to higher profit and acceptance of housing (construction))
- Specific types of urban land use may be transferred to other areas
- The political pressure of neighbourhood inhabitants leads to take care on polluted sites
- Remaining contamination (although acceptable) reduces the value of the land/buildings
- How can urban planners ‘keep in mind’ the remaining contamination for decades when the land use is going to be changed again?

Report of Mixed Groups

Table A
Attendees:
– Leader: Erik Mertens – City of Mortsel – Belgium
– Chris Balouet – Environment International – France
– Gabriele Büiring Stucki – Chloronet – Switzerland
– Natalia Cabitza – Stuttgart – Germany
– Amadou Thiam – Ineris - France

What are the 5 main elements (or priorities, or needs) you expect from a European “integrated approach” guide on this topic?

- Draw up EU-codes of good practice, easy access through internet but keep enough flexibility for innovation
- Common criteria for risk-management
- See the soil as an integrated entity
- Common criteria to define liabilities for remediation (when public authority – when private sector)

Table B

Attendees:

- **Leader:** Benoît Hazebrouck – INERIS – France
- Julien Correa – Grand Lyon –France
- Marcel Secker – City of Stuttgart – Germany
- Christian Cornet – CETIM – France
- Cedou Claude – Brezillion – France
- Christine Van Tricht – OVAM – Belgium

What should the final report look like so it will be really useful? How can we avoid that the work of three years will be hidden under the mass of information on this theme?

- tools corresponding to the best practices, and a follow up (CityChlor 2) putting them in application (like FOKS after MAGIC in Stuttgart)
- Databank with all information gathered with the way to find something in it.
- specific recommendations for each actor: how to characterise, to manage the site, according to the type of site
- **Do you think national or European mapping of soil structures and pollution's are necessary to be sure the Urban Planners can use the information and stimulate the remediation? How do you think this is possible? Should governmental financing that is used now to remediate be used to work out the mapping? And what about privacy and the problem of interpreting the results? Are there any alternatives for mapping to assure the urban planners can receive the information?**
 - Local mapping is necessary at the local scale (town) and has to be made available for public planners and the municipal authorities delivering the permits for construction/development projects. This is the case in France, Flanders, Stuttgart, with some completions of the inventories still running (Grand Lyon). The current inventories are accessible on Internet to the public in France and Stuttgart, not in Flanders. A recent law in France imposes that all documents related to the sites in the hand of the administration would have to be joined to the site description on Internet.
 - European mapping is not a priority at all. The Europe could just require all cities to have such a tool.

Table C

Attendees:			
– Leader: Franck Le Moing- ADEME – France			
Dominique DARMENDRAIL	BRGM	Other	France
Sébastien DENYS	INERIS	Other	France
Inge DE VRIEZE	OVAM	Policy Maker	Flanders
Pierre DELCOUR	CETE NORD PICARDIE	Other	France

What are the five main elements (or priorities, or needs) you expect from a European project?”

The European CityChlor guide must advocate a **sustainable** and **pragmatic** approach. (Actually we gathered points into 2 main topics instead of five!)

- **A SUSTAINABLE APPROACH**
 - **Cost-effectiveness**

It is necessary to weight pros and cons in terms of remediation objectives, feasibility of these aims and financial aspects and to study their evolution in the future.

- **Further evolution**

CityChlor guide/approach should take into account evolution of different matters/disciplines involved in. It can be for example for evolution of the techniques, of models (with a better comprehension of pollutant or soil behaviour), of needs (about drinkable water, new urban projects...).

Time and area are again two of the master words in an integrated approach because for example we must be able to answer to the questions “*When stop monitoring and what to do when monitoring ends?*” and “*what this area could be used for during a large time-scale?*”

- **Criteria of this guide/approach have to be clearly defined by the different stakeholders**

More discussion is needed with all involved stakeholders in order to put in relief all criteria/aspects that should be taken into account in CityChlor approach/guide. CityChlor Transnational workshop is a very good idea but there should be more Transnational workshops in order to allow these discussions. To improve representatives of this project, some additional professional webs can be asked (e.g. Common Forum on Contaminated Land in Europe).

- **A PRAGMATIC APPROACH**

- **Who does what?**

This guide should be very practical. There are so many guides already available. This approach should concretely define who does what on the field and real actions to be done (or not).

- **Define a common background**

There are so many huge differences from a country to another. For example thresholds are different. Therefore it would be better not to try to reach such a form of “harmonisation” but to list efficient tools we have in common in order to define a **“common background”**.

One of possible illustrations for this common background could be a formula or a model (standing for tools/guidelines we have in common) and in which every country should be able to enter its own data (thresholds, legal specificity’s...). And it’s important to know how to promote tools and techniques from every country.

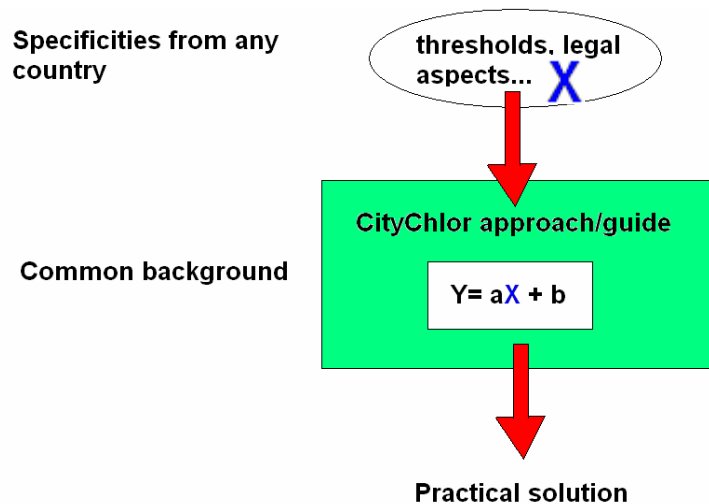


Figure 3: A common "background"

Table D

Attendees:

- **Leader:** Yves Duclos – ADEME- France
- Faurant Jean Frédérique – Communication expert – Vialaudis – France
- Flum Manfred – Remediation Expert – Villiger – Systemtechnik AG – Germany
- Goudesneune Eric – Envirosol NV – Belgium
- Hube Daniel – BRGM – France

Question: What are the 5 main priorities you expect from an “integrated approach”?

- a **financing system** (which possibilities exist ?) / - some financing means from EU level (in complement with local financing)
- a **common set of regulations** / - a **common methodology** (with technical respects, in order to avoid distortion and facilitate development of market)
- a **diffusion of known experience** (return of experience, pilot experimentation, ...) / - need of a network / - capitalisation of know-how and good practice at European level (for example the cost of 1 g CHC remediation)
- to stress
 - that there's **no miracle solution** and easy to define ratio cost / efficiency
 - an effort has to be done with **characterisation (view as an investment** instead of spending), in order to limit the risk of fail or to limit cost of remediation;
 - a **screening (non intrusive) approach** guideline (quick priority rank)

Other:

- to better appreciate the complex cases
- chemistry and all aspects of mobility of the pollutant
- hydrogeology of the site
- how to make historical investigation
- diagnostic methods
- to take into account other scale as work security, hygiene, ...

Question addressed to the CityChlor project:

What add value a European dimension for such [CityChlor] guideline? (compare to some national guidelines and their mutualisation?).

Because many differences occur between country / regions:

- Hydrogeology, industrial, urban and social context
- [for ex: quality of historical industrial document (site activity mapping, ...) are good in Switzerland respect to French situation with many renewal of activity on the same site]
- Difference with the use of technologies
- Disparities with the management of polluted site and soil

Table E:

Attendees:

– Leader: Albert De Vries

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Question: how can we report on the integrated approach in a way all target groups find the information they are interested in

- CityChlor can best report the socio-economical aspects of the integrated approach because this is new.
- The different approach of the 4 countries is really interesting and so interesting studies from the inventory should be translated. This will be a big added value.
- All available expertise should be reported and for each country the details should be available.
- The report should be a description of the process of how to integrate the different aspects (techn/socio/econ/comm)
- The report should have success stories of involvement of inhabitants and a ‘how to involve inhabitants’-description.

Table F:

Attendees:
– Leader: Hermann Kirchholtes – Stuttgart -Germany
– Carl De Cock – Haskoning – France
– Annette Esnault Filet – Soletache Bachy – France
– David Hiez – Tauw – France
– Philippe Janel – Drie IDF – France
– Antoine Joubert – Serpol – France
– Sindy Haemels – OVAM - Belgium

General question on integrated approach

In France the remediation can be driven by urban development (at least in Ile De France).

In Flanders the drive comes more from the environment (communication based on legislation)

Goal definition is very challenging.

(Interesting) comments by a different group

An integrated approach is necessary for a durable solution, which will include all technical and socio-economical aspects. This is necessary to re-develop a polluted area. CityChlor could improve to share knowledge on innovative remediation techniques between professionals and authorities.

A problem is to find finances for remediation of historical pollution.

Main problem for integrated approach is to join the different actors towards the same goal, which is to remediate the site to re-use it safely. The solution can be guidelines that are being used as soon as possible.

Table G:

Attendees:
– Leader: Griet Onraedt – OVAM – Belgium
– KARG Frank HPC ENVIROTEC France
– KUEHNER Joachim ZÜBLIN France
– LEMAIRE Bernard environmental official city IBGE - BIM Belgium

General question nr. 12: “What are the five main elements/priorities or needs you expect from a European “integrated approach” guide on this topic.

The discussion with people of different background was in fact a discussion between two contractors, two people of the government (OVAM and IBGE-BIM) and a person from ITVA. The discussion was a bit confusing so I only will give an enumeration of some topics on which we had some discussions or some of the people pointed out.

- There has to be a lot of attention on the use of communication tools; more demonstration projects can be useful to stimulate more people to work on the CityChlor project; Different countries have different politics and often that's a problem in working out a strategy. Maybe we could work towards global politics? Germany putted forward that they really have high standards, together with some other countries in North-West Europe. Between de North-West European Countries it is possible to have interaction but in the rest of Europe there is no such thing. First these countries have to be at the same level before interacting with the rest. In remediation there are always different aspects, goals, money and communication. Interesting thing of the CityChlor project is that new technologies are being used. It can also be interesting to work with Universities. They suggested a comparison with the classical techniques if possible. Technical knowledge is really a short term thing, while legal knowledge is something of long term.

Table H

Attendees:
– Leader: Patrick Krul - Agentschap NL - Netherlands
– LETHIELLEUX Laurence INERIS France
– LIETEN Shakti BIOCLEAR Netherlands
– MARCOUX Manuel Institut de Mécanique des Fluides de Toulouse France
– MEYER Armin ISODETECT Germany
– MOUSSET Emmanuel UNIVERSITY of PARIS-EST France
– MUCIG Charlotte CETE / LRPC de NANCY France
– VANHERWEGHE Bart AGFA-GEVAERT Belgium

Integrated approach is very good and necessary but putting it into practice is a great challenge. We have to talk the same language and 'organise' the approach, define who is responsible to take the lead. Innovative techniques are good but when it is tested in the laboratories it will only be used on the field in about 15 years.

Table I

Attendees:

- **Leader:** Fabrice Quiot – Ineris - France
- MALANDAIN Cédric ENOVEO France
- MONIER Philippe URS FRANCE France
- NI Zhuobiao WAGENINGEN UNIVERSITY Netherlands
- SULIMA Jean-Paul SEQUANO AMENAGEMENT France
- VANDEKERKHOF Renaat HOGESCHOOL LESSIUS MECHELEN Belgium

Do you think an integrated approach (technical + socio-economical) is realistic? What will be the problems when you have to implement this? How can CityChlor help to avoid these problems?

The project size and the geographical area should be considered here (land price, the profitability of real estate transaction ...). For a land developer, as part of a larger project, the pollution is a component part of the record needs to be done. A preliminary step (non technical) of consultation with the various owners is necessary, particularly to define the future use of the site. When the project progresses, as part of a prefeasibility study, knowledge of potential pollution is essential. This study may lead to further study and in this sense CityChlor can make progress on the appearance characterization as well as communication with people involved / concerned.

Table J

Attendees:

- **Leader:** Claire Rollin – Ineris –France
- Roussel Hélène ADEME France
- Sacchetti Lorenzo - CARUS Corporation- Italy
- Van de Putte Wouter MAVA Belgium
- Van Geert Karen ARCADIS Belgium
- Willems Gert STAD MORTSEL Belgium

“What are the five main elements (or priorities, or needs) you expect from a European “integrated approach” guide on this topic?”

5 points: Spatial planning. Pollution source investigation. Pollution remediation. Communication. Financial: who can pay for the remediation.

To divide costs. Central coordination is needed (city level). Permitting procedures (liability issues). If you pump, you can drive another plume (liability).

Legal framework for the investigations (done by OVAM) but more difficult for remediation costs.

One department as a regulator (in Belgium: Ovam). In Holland, difficult, many different persons. Important to have one organization responsible for the communication

In Belgium: many stakeholders. One accepted by all of them.
In Italy: local authorities meet together and have to say something.

Remediation plan has to be integrated into a redevelopment plan.
Investigation phase can drive the development plan.
Italy: about remediation. We have to be clear with the short term / long term objectives when communicating.
To be honest.

What happens in different country with regard to the law? Italy: site owner pays. This picture is missing in CityChlor?

Panel with normal people living. Public living close to sites should be involved most closely (at least at the end of the program). For communication aspects.
Also how to try to convince the site owner that he has to communicate?

Table K

Attendees:

- **Leader:** Peter von Schnakenburg – Stuttgart – Germany
- BILLET Philippe GESSOL-PROGRAMME France
- COMPERNOLLE Tine HASSELT UNIVERSITY Belgium
- MARMO Luca EUROPEAN COMMISSION France
- SCHURINK Erik CSO ADVIESBUREAU Netherlands
- TARTRE André WESA ENVIR-EAU Canada
- VAN DYCK Eddy OVAM Belgium
- VERVAEKE Pieter ENVISAN NV Belgium

Do you think an integrated approach (technical + socio-economical) is realistic? What will be the problems when you have to implement this? How can CityChlor help to avoid these problems?

The attendees stated that authorities could lead the process of integrated approach -plumes should be remediated as well, costs should be split to the polluters

Table L

Attendees:

- **Leader:** Bert Van Goidsenhoven – OVAM – Belgium
- DEVESCOVI SILVIA Ville de Sevrans France
- MOURIOT Florent BREZILLON France
- ONDREKA Joris ARCADIS Germany
- PHILIPPON Florian ADEME France
- THANNBERGER Laurent VALGO France
- VAN HAL Hannelore SERTIUS Belgium
- WICKERT Frank GUC-SECEG Germany

Who has to integrate all these aspects in one integrated approach?

- small scale projects: the urban planner is able to do this, as he already has to take several aspects into account
- larger projects: need for a project manager with basic knowledge of the different disciplines

Who do you want as CC output?

- do not want superficial output on common things
- want detailed case-studies & codes of best practice

Table M

Attendees:

- **Leader:** Jiska Verhulst – Belgium – OVAM
- NOURADINE EI Baz LEEFMILIEU BRUSSEL Belgium
- OLIVER Douglas MWH USA
- OUDIN Phillipe SEMACO France

Question: what should be the concrete outputs of WP4 CityChlor?

Discussion:

- lack of knowledge on site
- new techniques are often not well applied: there's need for a standardised approach
- we need to use more the intermediates (eg consultancy, communication experts) in case of the difficult problems of contamination; there should be more attention on "the interface";
- why not introduce a special accreditation for complex problems of contamination (chlorinated solvents)?

Suggestion: read the book or watch the movie "Civil action" it's on a complex contamination problem and the communication that was set up around it