



BACad

LIFE07 ENV/B/000022



AFTER LIFE COMMUNICATION
PLAN



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1. Introduction

BACad : Using full scale bioaugmentation for cost-efficient remediation of a large CAH groundwater contamination

Groundwater contaminations with chlorinated aliphatic hydrocarbons are (because of their characteristics) very difficult and expensive to remediate with traditional remediation technologies. The Punch Metals site is characterized by a very large CAH groundwater contamination that has migrated about 1km off-site, underneath a forest and has reached a depth of 50m. Punch Metals wants to remediate this off-site groundwater contamination in a cost efficient and environmentally sound way keeping the impact on the ecosystem as low as possible.

By introducing an organic substrate (carbon source) and suitable bacteria full dechlorination (to the harmless end product ethylene) is reached as already demonstrated in lab tests. This is called bioaugmentation (BA). BA, on this scale, has not yet been used in Europe as remediation technique. The main objective of the project is to demonstrate that BA can be achieved on full-scale in a cost-efficient and environmentally sound way (compared to traditional techniques).

The project has been carried out in different phases. In a first phase, potential useful microbial consortia were screened in order to select a population that is supplementary to the existing on-site population. In a second phase, organic substrate and the selected microbial culture were injected into a limited number of injection wells. Afterwards, the remediation has been up-scaled to cover the entire contaminated off-site area.

The main objectives of this project were the following:

- Demonstrate the feasibility and cost-effectiveness of full-scale BA for the remediation of a large CAH groundwater contamination, reducing concentrations below remediation standards
- Obtain reliable data that can be used to develop work methodologies for the application of the remediation technique on other contaminated sites with similar types of pollution (work methodology for the implementation of BA as a remediation technology, work methodology for the transfer of the microbial population from one remediation zone to another)
- Demonstrate the environmental benefits of the technique in comparison to traditional remediation techniques (less consumption of water, less production of secondary waste and emissions, less energy consumption, lower carbon footprint, less harm to ecosystems, ...)
- Assure the dissemination of knowledge gathered in this demonstration project to target groups (remediation industry, research institutes, companies having large CAH contamination).



2. Results

The overall technical applicability and the economic feasibility of BA are demonstrated. That a practically feasible methodology for the transfer of the CAH-degrading microbial population from one remediation zone to another can be developed. That a significant decrease in remediation costs (approx. 50%) and time (approx. 35%) can be realized applying BA.

3. Communication strategy

3.1. Stakeholders

Public authorities

The Flemish public authority which is in charge of supervising the groundwater remediation is OVAM (Openbare Vlaamse Afvalstoffenmaatschappij).

Industry

Numerous companies (metal processing companies, dry cleaners, ...) in Europe face groundwater contamination with CAHs.

The Belgian metal processing industry is represented by Agoria, the dry cleaners are represented by Vlabotex.

Research institutes

The demonstration project being successful for chloro-ethylenes, the technique of BA as such can also be used for other sites where chloro-ethylenes have to be remediated and where other consortia of bacteria are introduced into the groundwater.

3.2. Methods of dissemination

3.2.1. Actual

Website

The main method of dissemination is the website. Interested visitors are at all times encouraged to contact the partners for further information.

<http://www.bioaugmentatie.be/>

Remediation reports

Ovam is regularly informed about the progress and results of the project by regular progress reports ("Tussentijds rapport" 's, this is a legal obligation).

Presentations at the following conferences



- At the Eight International Conference on Remediation of chlorinated and recalcitrant compounds in Monterey, CA, May 21-24, 2012 (the largest soil remediation conference in the world);
- Remediation Technologies and their Integration in Water Management, International Symposium, Barcelona, 21-25 September 2012 (poster presentation)
- At the workshop on “Innovative site remediation technologies” organized by the University of Leuven at Diepenbeek on January 10, 2013.
- At the “Second European Symposium on Water Technology and Management” at Leuven, November 21-22, 2013;
- At the European AquaConsoil conference in Copenhagen on June 9th 2015 (the largest soil remediation conference in the EU. <http://www.aquaconsoil.org/>).

Newsletters

Five “Newsletters” have been written and can be found at the project website.

Site visit

A site visit was organised for local and regional authorities, neighbours and employees of the factory on June 14, 2012 .

Mailing

Regular mails have been sent to the industrial stakeholders Agoria & Vlabotex.

Annual reports Punch Metals nv

Seven legal reports were published.

3.2.2. Future dissemination

Website

The main method of dissemination continues to be the website. The website will be updated with new results on a six months basis. Interested visitors will be at all times encouraged to contact the partners for further information.

Remediation reports

Ovam continues to be regularly informed about the status of the project by remediation progress reports (the “Tussentijds rapport”), this is a legal obligation.

Site visit

We will try to organize a site visit in cooperation with KVIV (Flemish engineers organisation) for students of the University of Leuven (campus UCLL) in fall 2016 or spring 2017.



Mailing

Regular mails on the status of the groundwater remediation will be sent to Agoria & Vlabotex.

Layman's report

The Layman's report will be sent to following stakeholders:

- Agoria, Vlabotex
- Authority of the town Hamont-Achel
- Agency for Nature and Forest
- VMM
- Aquafin.

Annual reports Punch Metals nv

Every year a legal report concerning the activities of the company will be published. This report will contain information on the progress of the groundwater pollution remediation.

Presentations

RSK will make presentations at international conferences, including publications in conference proceedings. The life logo will be used and community support mentioned.

Centre of excellence

This centre of excellence was founded by RSK in 2008.

The purpose of this centre of excellence is to support RSK staff technically in delivering high quality projects to our clients and deliver consistent and technically sound solutions for environmental issues including groundwater contamination across all the countries RSK operates in.

The centre of excellence team is coordinated by Lucy Thomas. The core centre of excellence team members are illustrated in the diagram below and have each their specialism. Paul Upton and Felipe Couto are the persons which are specialized in remediation. Staff members can contact them for peer reviews or for technical help. Staff will be developed through knowledge sharing initiatives such as centralized training, bulletins and webinars.



The centre of excellence can be reached by mail: info@rskgroup.be.

Specific for Remediation: Paul Upton and Felipe Couto can be contacted:

Paul Upton:

Helsby Head Office

Spring Lodge

172 Chester Road

Helsby Cheshire WA6 0AR

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Specific for the LIFE+-project, Baue Boonen of RSK can be contacted.

3.3. Contacts

Punch Metals

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