SNOWMAN NETWORK
Knowledge for sustainable soils

Project No. SN-04/01

BALANCE 4P

Balancing decisions for urban brownfield regeneration – people, planet, profit and processes

Deliverable 1.4: Final Report Part I

Start date of project:
01.10.2013

Project duration:
15/21 months (2013 – 2014/2015)

End date of project: 31.12.2014/30.06.2015

Date of report: 15.01.2015

Project coordinator:

Jenny Norrman

Name of coordinator organisation:

Chalmers University of Technology

Revision:

SAMEN MAKEN WE MORGEN MOOIER

skb
duurzame
ontwikkeling
ondergrond

formas

TABLE OF CONTENT

1 INTRODUCTION

1.1 Background

Land take as a result of urbanization is one of the major soil threats in Europe. One of the key measures to prevent further urban sprawl and additional land take, is redevelopment of urban brownfields: underused urban areas with, in many cases, soil and groundwater pollution. The latter issue can be a bottleneck for redevelopment of brownfields instead of green fields. A difficulty for brownfield redevelopments is that in urban projects the responsibilities, tools and knowledge of subsurface engineering and urban planning and design are not integrated; they depend heavily on each other but work in sectors. The urban designer usually deals with opportunities for socio-economic benefits while the subsoil engineer deals with the technical challenges of the site. Better cooperation between urban developers and soil specialists can accelerate brownfield redevelopment.

1.2 Aim of Balance 4P

The overall aim of BALANCE 4P is to deliver a holistic approach that supports sustainable urban renewal through the redevelopment of contaminated land and underused sites (brownfields). In order to reach the overall aim, the specific project objectives focus on different parts of the holistic approach:

- application and assessment of methods for design of urban renewal/land redevelopment strategies for brownfields that embrace the case-specific opportunities and challenges (WP3);
- sustainability assessment of alternative land redevelopment strategies to evaluate and compare the ecological, economic and social impacts of land use change and remedial technologies (WP4);
- development of a practice for redevelopment of contaminated land in rules and regulations to enable implementations (WP5).

The different parts will be integrated into a decision process framework to support urban renewal through the redevelopment of contaminated land and underused sites (WP6). The resulting framework aims to have a strong focus on integrating urban planning and soil issues.

1.3 Project consortium

The project consortium has a wide knowledge and experience base. The following persons have contributed to the project outcomes:

Deltares (NL): Linda Maring, Suzanne van der Meulen, Maaike Blauw
TU Delft (NL): Fransje Hooimeijer, Lidewij Tummers
VITO (BE): Steven Broekx, Kaat Touchant, Alistair Beames

Chalmers (SE): Jenny Norrman, Yevheniya Volchko, Jaan-Henrik Kain, Rita Garcao, Lars Rosén
Enveco Environmental Economics Consultancy (SE): Mats Ivarsson
R3 Environmental (UK): Paul Bardos
Municipality of Rotterdam / Port of Rotterdam (NL): Maike Akkers, Carel Andriessen, Ignace van Campenhout, Kees de Vette, Joost Martens, and colleagues
Municipality of Göteborg (SE): Hanna Kaplan, Christian Carlsson
HSB/Balder (SE): Elisabeth Forsberg
Students from TU Delft (NL): Nirul Ramkisor, Jelle van Gogh, Felix van Zoest, Barbara Bekhof, Sebastiaan Huls, Janneke van der Leer, Lena Niel, Judith Gaasbeek Janzen, Sebastiaan Huls, Mick van der Steeg, Juliska Wijsman, Joop Stuijt, Carmem Felix Aires, Eelco de With, Jan ten Kate, Willard van der Velden
Students from VU Amsterdam (NL): Sien Kok
Students from Chalmers (SE): Rita Garcao, Robert Anderson, Amardeep Amarvasai, Ingrid Olofsson, Nathalie Coulho
OVAM (BE): Bert Van Goidsenhoven, Annelies Van Gucht

In addition, several other stakeholders and experts have been involved in the workshops, contributing with their time, knowledge and experience. The project outcome is a result of the joint contributions.

1.4 Overview of deliverables and milestones

Table 1.1 shows an overview of the listed milestones and deliverables in the proposal, and the degree of achievement so far in the project. The milestones and deliverables are further elaborated within the work descriptions in Section 2.

Table 1.1. Overview of deliverables and milestones.

WP	Milestones and deliverables	Achieved
WP1	**Project Management and Co-ordination**	
	D1.1 Consortium agreement	100%
	D1.2 Mid-term report (with contributions of all WPs)	100%
	D1.3 Draft final report (with contributions of all WPs)	100%
	D1.4 Final report Part I (with contributions of WPs 3 – 5 + 6)	100%
	D1.5 Final report Part II (with contributions from WP6)	20%
	M1.1 Consortium agreement	100%
	M1.2 Project kick-off meeting	100%
	M1.3 Meeting with coordinator and the chairman of the relevant Project Board at the beginning of the project	100%
	M1.4 All-projects-kickoff meeting	100%
	M1.5 All-projects-workshop at half of the duration of the project: presentation and discussion of interim results of the projects[1]	0%
	M1.6 All-projects-final meeting: present and discuss the final results of the project[2]	0%

[1] A meeting is planned during March 25 – 26, 2015 in Paris– Jenny Norrman will participate.

WP2	**Dissemination and Exploitation**	
	D2.1 Internet based dissemination and communication, including project specific webpage and information (project factsheet) and Dropbox platform.	100%
	D2.2 Article for 1) field of spatial planning and 2) environmental sciences (to be published in national magazines in national language)	50%
	D2.3 Participation in national and international workshops and conferences.	100%
	D2.4 Executive summaries of results for web publication.[3]	75%
	M2.1: International stakeholder workshop: will be used to test the interim outcomes of the project and to exchange the information of the cases. This workshop defines the points of attention for the work packages in the remaining period of the project.	100%
WP3	**Application and assessment of methods for design of land redevelopment strategies**	
	D3.1 Methodology for stakeholder analysis and analysis case specific workshops	100%
	D3.2 Advice for the cases (in national language, included in del. 1.4 in English)	100%
	M3.1: The workshop methodology and evaluation protocol will determine how we perform the further activities in this work package	100%
	M3.2: The stakeholder analysis will result in a decision about who will be involved in the case studies	100%
	M3.3: The case-specific workshops will result in an overview of potential scenarios for redevelopment of the case areas that will be further elaborated in Task 4.	100%
	M3.4: The advice following assessment of the tools determine the form of the framework of deliverable 6.1	100%
WP4[4]	**Sustainability assessment framework for alternative remediation and redevelopment scenarios**	
	D4.1 Scientific article reviewing existing DSS systems	100%
	D4.2 Review of mapping ESS and system boundaries	100%
	D4.3 Conceptual design of sustainability assessment method, changed to *Application of sustainability assessment methods on the Belgian and Swedish case.*	100%
	D4.4 Recommendations for the application of the sustainability assessment method	50%
	M4.1 Reviewing existing approaches	100%
	M4.2 Indicators and structure of proposed method, changed to *Review indicators and structure of available methods to extend system boundaries.*	100%
	M4.3 Develop conceptual model of sustainability assessment method, changed to *Application of existing sustainability assessment methods*	100%
	M4.4 Application of method and refinement, changed to *Comparing existing methods and how they can be implemented in a planning process*	50%

[2] No meeting is yet planned after the end of the project (2015-06-30).

[3] Results of part I. To be published.

[4] The deliverable 4.3 and the milestones 4.2, 4.3 and 4.4 in WP4 have been changed during the course of the project.

WP5	**Implementation of 4P in planning process/project**	
	D5.1 Scientific article on implementation 4P in planning process/project[5]	100%
	M5.1: Understanding the planning systems, urban development and building practice of each country and by comparison have a view on best practice.	100%
	M5.2: Understanding the difference in policies concerning soil conditions in the three countries,	100%
	M5.3: Connection of the context to the projects must result in improving the P4 approach	100%
	M5.4: Out of the box workshop with students to test the P4 approach	100%
WP6	**Integrated decision process framework**	
	D6.1 Scientific article on the integrated decision process framework for sustainable urban planning and regeneration of brownfield sites.	0%
	D6.2 Separate guidance report on the decision process framework.	0%
	M6.1 Workshop for Swedish stakeholder review of the suggested framework.	0%
	M6.2 Workshop for Dutch and Belgian stakeholder review of the suggested framework.	0%

1.5 Scope of final report part I

The report contains summaries of the work carried out so far in the project, as well as short descriptions of a number of attachments. These attachments are project deliverables and a technical report with the outcomes of the project.

[5] This is in manuscript form.

2 DESCRIPTION OF WORK

2.1 WP1. Project coordination

A consortium agreement was delivered to the SNOWMAN network on December 5th, 2013 (D1.1). Both a project kick-off meeting was held (in Utrecht in October 2013, M1.2) and the project coordinator (Jenny Norrman, Chalmers) attended the joint kick-off meeting for all call 4 projects in November 2013 in Paris (M1.4). Prior to the kick-off meeting, the project coordinator and the project board chairman (Bert Van Goidsenhoven, OVAM) had a telephone meeting (M1.3).

The mid-term report was delivered on June 13th, 2014 (D1.2) and a revised version was delivered on September 8th, 2014.

Dropbox is being used as platform to share documents and regular (approx. monthly) status meetings are held with one representative from each organisation (Jenny Norrman, Chalmers; Steven Broekx, VITO; Linda Maring, Deltares; Fransje Hooimeijer, TU Delft) via Adobe connect and Skype. Adobe connect allows screen sharing to promote discussions at the meetings. A planned physical meeting in March 2014 was replaced with a videoconference, which worked very well. Another videoconference was held in April. Each team also organizes their own meetings within the group and with case stakeholders. Table 2.1 show an overview of project communication activities. Internal meetings within the different national research teams are not included in the table, neither are informal/undocumented discussions via Skype or telephone between partners.

Table 2.1. Overview of project internal communication activities.

INTERNAL COMMUNICATION			
Type of activity	**target group**	**date**	**documentation**
Kick-off meeting in Utrecht	Project group	3-4 Oct 2013	Documentation on Dropbox
Dropbox Balance 4P	Project group	October 2013	-
Status meetings (Linda, Fransje, Steven, Jenny + invited persons)	Project group	~monthly	Minutes on dropbox
Meeting with Project Board Chair Bert van Goidsenhoven (Jenny)	Project group	Nov 2013	Minutes on dropbox
WP4 discussion meeting	WP4 group	Dec 2014	-
WP4 discussion meeting	WP4 group	Jan 2014	Material posted on Dropbox
Project meeting, videoconference	Project group	March 28th, 2014	Minutes on dropbox
Discussion meeting, videoconference	Project group	April 28th, 2014	Minutes on dropbox
Project meeting, Frankfurt	Project group	October 17th, 2014	

2.2 WP2. Dissemination

Several dissemination activities have been carried out. A project web-site, a project folder and the Dropbox platform was set up during the autumn 2013 (D2.1). The project team has attended several national (4) and international (4) conferences and seminars to present the project and to disseminate results of the project (D2.4). Another important way to disseminate knowledge has been the smaller workshops with the stakeholders in the cases. In Rotterdam, 3 workshops have been carried out and in Fixfabriken, 2 workshops have been carried out. In addition, one on-line joint international stakeholder workshop has also been carried out (M2.1), where all case holders from Rotterdam, Fixfabriken and Alvat had the chance to see what had been done in the other cases and to exchange experiences. A summary of the international stakeholder workshop can be found as an attachment, see Section 4. Table 2.2 lists the main communication and dissemination activities. Discussion and planning meetings with the stakeholders of the different cases are not included in this list.

Table 2.2. Overview of dissemination activities within Balance 4P.

EXTERNAL COMMUNICATION			
Type of activity	**target group*)**	**Date**	**Weblink/documentation**
Summary at the SNOWMAN website	1,3	June 2013	http://www.snowmannetwork.com/main.asp?id=255
Project website (at Chalmers website)	1,2,3,4	Nov 2013	http://www.chalmers.se/en/projects/Pages/Balance-4P.aspx
Posted project on the SNOWMAN landscape	1,3	Nov 2013	http://snowmanlandscape.com/projects/balance-4p-balancing-decisions-for-urban-brownfield-regeneration-people-planet-profit-and-processes/
SNOWMAN knowledge dissemination meeting Paris, presentation (Jenny)	1	Nov 19-20, 2013	http://www.snowmannetwork.com/pagina1kolom.asp?id=69
Project posted on LinkedIn, 14 members	2,4	Nov 2013	-
Publication of article in Dutch (spatial planning) magazine S+RO (Fransje, Linda)	2,3	Dec 2013	Hooimeijer, Fransje, Linda Maring (2013). Ontwerpen met de ondergrond. S+RO 2013/6, pp 52-56 http://nirov.platform31.nl/Home/Publicaties/Tijdschriften/S_RO.aspx
Meeting with Andy Cundy from GREENLAND project (Linda, Fransje, Steven, Jenny)	3	Dec 2013	Dropbox

Abstract to AESOP Association of Schools of Planning (abstracts to Dec 31), Fransje sent abstract, dec 31 2013. *Not accepted.*	2,3	March 7-9	http://www.aesop-planning.eu/
Publication of review paper in STOTEN (Alistair, Steven, Kaat et al.)	3	Feb 2014	http://www.sciencedirect.com/science/article/pii/S0048969713011881
Renare Marks vårmöte 2014, oral presentation (Jenny).	2 (Swedish branch) + 3	April 2 2014	http://www.renaremark.se/filarkiv/konferens/2014/Varmote2014/presentationer/10_Balance_4P%20Jenny%20Norrman%20140402.pdf
Stakeholder workshop Rotterdam I (Linda, Fransje, Kaat, Jenny)	1,2	March 31	Dropbox
Student workshop in Göteborg, Fixfabriken (Jenny, Fransje, Linda, Jaan-Henrik)	1,2	April 24-25	Dropbox
Presentation on Balance 4P to municipality (Urban planning office) of Göteborg (Jenny, Fransje, Linda, Jaan-Henrik)	2	April 25	Dropbox
Presentation of Fixfabriken student workshop results to municipality and developer (Jenny, Fransje, Linda, Jaan-Henrik, Lars, Yevheniya)	1,2	April 25	Dropbox
Web-meeting with the HOMBRE project (Jenny, Linda)	1	April 25	-
Student workshop in Rotterdam (Fransje)	1,2	May 8-9	Dropbox
Stakeholder workshop I Fixfabriken (Jenny, Jaan-Henrik, Yevheniya, Mats)	1,2	May 26	Dropbox
Plandag, coop between B and NL planners, Zaandam. Presentation	1,2	May 22	http://www.plandag.net/2014/
World in Denmark 2014- Nordic Encounters: Travelling Ideas of Open Space Design and Planning, Copenhagen, Oral presentation June 12 (Fransje)	2,3	June 12-13	http://ign.ku.dk/english/outreach-publications/conferences-seminars/world-in-denmark-2014/
URBAN-NEXUS Final Conference. B4P Poster presentation (Maaike Blauw, Deltares)	2,3	June 18	http://www.urban-nexus.eu/www.urban-nexus.eu/
Internship master student TUDelft at VITO	1	May-July	
Individual stakeholder interviews ALVAT case with Ministry of Public Works, Municipality of Buggenhout, Santerra (redeveloper)	1,2	June 26, July 1	
Day of the Urban Underground on the International Architecture Biennale Rotterdam (Fransje)	2,3	July 11th	www.iabr.nl
In Situ Remediation '14, London. Presentation of end results review and poster presentation of project (Alistair, Steven)	2,3	Sept 2-4	http://theadvocateproject.eu/conference/main.html

Sustainable remediation, Italy (parallel with RemTech at same location). Abstract accepted (Jenny) but no one could go!	2,3	Sept 17-19	http://www.surfitaly.it/sustrem2014/index.html
Stakeholder workshop II Rotterdam (Linda, Fransje)	1,2	Sept 23	Dropbox
Stakeholder workshop II Fixfabriken (Jenny, Yevheniya, Mats, Rita)	1,2	Oct 13	
CABERNET meeting Frankfurt, 2 abstracts accepted (Fransje + Jenny). Oral presentations Oct 15th (Fransje) and Oct 16th (Jenny)	2,3	14-16 Oct	http://www.zerobrownfields.eu/content.aspx?wp=2&p=234
Presentation set up and results at Agentschap Ondernemen	1	Nov 7	
International online stakeholder workshop with the cases (20 attendees) with online questionnaire	1,2,3	Nov 12	Recorded version available on request.
Article " Harmony between surface and subsurface" submitted in: Nordic Encounters theme issue of Nordic Journal of Architectural Research (Fransje)	2,3	Nov 15	http://arkitekturforskning.net/na
Bodembreed symposium, special session submitted (Linda). 2 oral presentations on Balance4P (Fransje, Steven, and Nanna Pluim from the municipality Rotterdam)	2,3	Nov 18	http://bodembreed.nl/herontwikkelen-van-brownfields/
CI:aire's Advocate Bulletin November, summary of review article on sustainability assessment methods by Alistair Beames	2,3	Nov 30	
Presentation of end results Alvat case at OVAM	2	Dec 18	
Stakeholder workshop III was replaced with a smaller meeting with municipality of Rotterdam and an investigation on how to take subsurface in account in the development products (vision and tender documents) (Linda, Fransje)	1,2	–Dec 9	
Abstract submitted to AquaConSoil (Jenny + Linda)	1,2,3	Dec 15, 2014	http://www.aquaconsoil.org/

*) The target groups are defined in the proposal as: 1) the project partners and the "SNOWMAN community", 2) the professional community, 3) the scientific community, and 4) the wider community.

2.3 WP3. Application and assessment of methods for design of land redevelopment strategies

WP3 focused on the application and assessment of methods for designing alternative land redevelopment strategies, embracing case-specific chances and challenges. Many of the tasks were performed in a workshop-setting, in which an active role of the case-holders is anticipated. There are three cases involved: Merwevierhavens (Rotterdam, The Netherlands), Alvat (Buggenhout, Belgium), Fixfabriken (Gotenborg, Sweden).

In WP3 five tasks were defined. Task 3.1 consists of defining a standardized methodology and evaluation protocol concerning cases (M3.1). This was delivered in the mid-term report

(D3.1). In task 3.2 stakeholder analyses (quick scan) were performed for the cases (M3.2). In task 3.3 opportunities and challenges of the cases, emerging from the subsurface were determined in a workshop setting (M3.3). Task 3.4 consisted of giving a more specific advice for cases (D3.2). In task 3.5 we made an overview of applicable tools and evaluated the applied tools (M3.4). The results of this task contributed to the final framework for sustainable redevelopment of brownfields that is developed in WP 6.

2.4 WP4. Sustainability assessment framework for alternative remediation and redevelopment scenarios

The objective of WP4 is to test and develop methods for sustainability assessment of alternative land redevelopment strategies to evaluate and compare the ecological, economic and social impacts of alternative strategies of land use change and remedial technologies. Means of accounting for the spatial planning value gains of brownfield regeneration in terms of soil ecosystem services (ESS), social and economic impacts on a broader urban scale are developed.

The work package started from a review of existing sustainability DSSs and associated indicators. It continued with a review on relevant sustainability indicators for a larger system boundary with a focus on social aspects and ecosystem services to improve and develop assessment methods. Existing sustainability assessment tools were tested and applied on the individual case study areas of Goteborg and Alvat. For Alvat, this includes the OVAM MCA, ecosystem service valuation with the Nature Value Explorer and a biodiversity check. Also, a profitability assessment was performed in combination with the risk assessment. For Goteborg this included a qualitative mapping exercise of ecosystem services and the application of the SCORE tool. Conclusions on the application and how tools fit into an entire planning process were gathered based on stakeholder feedback.

2.5 WP5. Implementation of 4P in planning process/project

This WP studied the planning context, best practice and building process in the three countries. Comparing the countries and especially comparing spatial planning and soil management is quite difficult since the world of planning is very fluid and information is scattered. We used a method “Commin” to grasp the material and be able to make a comparison (M5.1, M5.2). The final article manuscript (D5.1) is standing on the shoulders of earlier versions that are presented at Plandag 2014, The World in Denmark Copenhagen (12/13 June 2014) and in Frankfurt 15th October CABERNET 2014. The article is submitted to the *Journal of Land Use, Mobility and Environment* and *ICE Urban Design journal.* The comparison resulted in conclusions about input to the holistic approach, i.e. where the subsurface can be lifted forward in the current system (M5.3).

We held 2 student workshops (M5.4), one in Goteborg and Rotterdam. They were very fruitful and we also found out that working with students can be a method in a project: it enforces cooperation between the research partners and between the project team and the clients in the cases. The results of the workshops are more elaborated on: six students were

working further on Goteborg and two on Rotterdam. One student was working on the case in Belgium.

2.6 WP6. Integrated decision process framework - a concretization of the holistic approach

The focus of WP6 is to describe a decision process framework which summarises the important findings from all technical WPs and which can give advice on how to plan and execute a process, or parts of a process, to support urban renewal and redevelopment of brownfields. The framework aims to optimize (i) brownfield redevelopment, and (ii) land use, and has a strong focus on integrating urban planning and remediation decisions as being one aspect of subsurface issues.

The framework is (a more concrete) part of the holistic approach as outlined in the technical report, but the holistic view tells us that the framework is only one part of the whole system. It does not operate on its own. Focus in the framework is knowledge exchange between the surface and the subsurface sector and advice on WHO and HOW this knowledge exchange effectively can take place. Important input to the framework, apart from the more theoretical work in the WPs 3, 4 and 5, are the experiences from the cases and the stakeholders. The framework will be further elaborated during spring 2015.

3 CASE STUDIES

Before and since the start-up of the Balance 4P project, multiple meetings with case stakeholders have taken place. This resulted in a different set of cases than those described in the proposal participating to the Balance 4P project. Table 3.1 gives an overview of which cases are included and in the following sections, brief descriptions of each contributing case are provided.

Table 3.1. The national cases included in Balance 4P.

Country	Mentioned in proposal	Participating in B4P project
Netherlands	Scheveningen Harbour area, The Hague	Merwevierhavens, city harbours Rotterdam
Belgium	Flemish Case SRI Vilvoorde – Machelen	Alvat Buggenhout
Sweden	RiverCity Gothenburg (Centrala Älvstaden)	Fixfabriken Gothenburg

3.1 Merwevierhavens, Rotterdam (NL)

The city harbours of Rotterdam are redeveloped in a large project, on both sides of the river Meuse. The whole area is in transition and will become available for urban functions, while the harbour functions are moving or changing. The objective is to mix urban and harbour activities. At first the idea was to realise a more intensive residential area, but because of the financial crisis and the well-functioning clean tech medical and food activities, the latter is being promoted in the area. For Balance 4P, the area Merwevierhavens (M4H) was chosen as case study. This area is in a vision phase and there are still possibilities to investigate the chances of the subsurface within this vision. The redevelopment is being performed by the municipality and the port of Rotterdam together. There are now three tracks from “aboveground”:

- Mapping “what is there”
- Development strategy, vision for 2035 (5 to 7 years, no regret program that contributes to the final goal for the area.
- Acquisition and area branding (was fruit harbour). The harbour has no future for the current activities. The program bureau for the redevelopment is redeveloping the area in an ‘organic’ way, but prefers to go directly for the final planning and is searching for prominent as far as companies: pioneers, clean tech medical & food, creative industry.

As far as the subsurface concerns, there is a lot of potential for the subsurface. A lot of data is available, but the focus lies mainly on problems. Chances are not yet being explored. The main questions for the program bureau are: What are innovative possibilities for the

subsurface in relation with the aboveground redevelopment? How can we use subsurface in the development strategy?

3.2 Alvat (B)

In agreement with OVAM, Alvat was selected as the Belgian case. The study area was until 1995 owned by ALVAT N.V. The site is now an abandoned and underused industrial area of 4.6 hectares, located in the municipality of Buggenhout along the river ‘Scheldt’ and adjacent to the living area 'Oude Briel' in the North. The site is highly polluted and this is due to the former activities of the company (container reconditioning services and the production of new containers). Activities such as storage of oil products and solvents in tanks and containers, cleaning of containers using these solvents and storage of containers across large parts of the site gave rise to a contamination with BTEX, VOCs, mineral oil, heavy metals, PCB and PAHs. In addition, in February 2008 an industrial landfill was found nearby the railway that consisted of containers (filled with wood, concrete, paint residue etc.) At this landfill, heavy metals, volatile organic hydrocarbons), plastic waste, phenols and cresols, phthalates, halogenated hydrocarbons, mineral oil and methylisobuthylketon were measured.

The redevelopment of the Alvat-site is currently blocked. The major bottlenecks in this project beside the presence of a serious soil contamination are the uncertainty about the future destination and the ownership situation. According to the zoning map (gewestplan) the site is currently planned as industrial area. The municipality of Buggenhout wishes to reclassify the site towards a mix of housing and recreation. Other stakeholders as the province of East Flanders, together with the city of Dendermonde, the POM East Flanders (Development agency of the province of East-Flanders) and Waterwegen en Zeekanaal are working on the redevelopment of an industrial site adjacent to the Alvat site to become a water-bound business park, given its location on the waterfront. The Alvat site could potentially also be a part of this project. Since the bankruptcy of Alvat N.V. the site is under the supervision of a curator. OVAM is the responsible authority for soil contamination and remediation. When a site is seen as a blackfield (location where a marked-based redevelopment is not possible due to contamination) OVAM can acquire the site and finance the remediation so the site can be reused/redeveloped.

The Alvat site was seen as a blackfield, a location where a market-based redevelopment is not possible due the heavy pollution. OVAM already financed a part of the remediation (remediation of the landfill). At this moment a brownfield developer specialized in the purchase and remediation of contaminated grounds is potentially interested in the site. An added value for this research is the combination of expertise in soil research and remediation on the one hand, and spatial planning/sustainability assessments on the other hand.

Based on a stakeholder consultation and a sustainability assessment, more specific designs for alternative visions for this site (industry, residential, recreational area, combinations) are developed and compared with different types of sustainability assessments.

3.3 Fixfabriken (SE)

The Fixfabriken area was chosen because there is at present a large interest in the case and the planning process is on-going and parallel to the Balance 4P project. The main stakeholders had an interest to participate, to contribute and to learn from the planned work within Balance 4P.

The Fixfabriken area is an area located in a popular part of Western Gothenburg. At present, it is mainly an area with industrial use (a factory, buss garage, tram hall and smaller enterprises) but it is now in the planning process for redevelopment into an area with a much more mixed use, i.e. residential housing, commercial buildings and public spaces. The buss garage will move in the coming 5 years and the tram hall is also likely move to another location in the future (10 – 15 years). There are mainly two landowners: the municipality itself and a private developer consisting of two large companies (HSB and Balder). The urban planning office of the municipality is in the process of changing and developing the detailed plan of the area to make it possible to redevelop into different land-uses than the present. Already a number of workshops and meetings have been carried out to explore what the neighbours and the existing companies prioritize and what they find valuable in the area. The potential of the area fits very well into the political objectives of the city: development of this area would not take any virgin ground into account, it is near to public transportation, it could potentially contribute with a good portion of residential housing, there is a possibility to complement the neighbouring area with now missing commercial and social services such as a food store and a sports facility, there is already a mixed use of the site and it is an attractive part of the city. Another prioritised political objective is integration, which delivers some more concern about how to achieve.

The Balance 4P project is involved in the whole area with both land-owners in order to lift forward the subsurface issues and their connection to the redevelopment potential of the area. Contamination is an important feature as there may be chlorinated solvents (DNAPLs) spills from the factory, but geotechnical issues (water + ground settlements) as well as archaeological findings makes the site complex from a subsurface point of view.

The following are main points of attention with regard to the subsurface:

- Contamination – mainly with regard to DNAPLs and the possibility to build residential housing
- Geotechnical issues – mainly with regard to keeping the groundwater level at sufficiently high level to avoid ground settlements (and high costs) in the surrounding
- Archaeological findings – mainly with regard to potential preservation/excavation and how this relates to contamination and geotechnical issues.

3.4 Comments to the cases

All three cases are different with regard to location, planning and remediation systems, in which phase the redevelopment is, landowners and stakeholders. The Alvat case differs somewhat more from the Rotterdam and the Fixfabriken case as it is situated in a more rural area where land pressure is lower than in urban areas. The location of the site contributes to

the site being a blackfield; another more attractive location in an urban area could potentially make a market-based redevelopment possible. Here, pollution is really a bottleneck, whereas this is not the case in Rotterdam or in Fixfabriken. At those sites, contamination must be considered but will not hinder a market-based development. Focus of the Balance 4P project was originally intended to be on urban sites: the drivers for redevelopment in rural and urban areas can be quite different.

4 DESCRIPTION OF ATTACHED DOCUMENTS

Deliverable D3.1 and D4.1 were delivered in the mid-term report, thus therefore not included here. D6.1 and D6.2 will be included in the Final report Part II, due June 30, 2015.

4.1 Final Technical Report Part I

The final technical report contains the main outcomes of the project with the aim to deliver a stand-alone technical report as a product of the project.

The technical report contains the following deliverables
D3.2 Advice for the cases in English – equals parts of Section 6 and associated appendices in the main report.
D4.2 Review of mapping ESS and system boundaries – equals Section 5.
D4.3 Application of sustainability assessment methods on the Belgian and Swedish cases – equals parts of Section 6.2 and 6.3.
D4.4 Recommendations for the application of the sustainability assessment method – parts of this deliverable are presented in Section 6.2 and 6.3.

4.2 D5.1 Scientific article manuscript on implementation 4P in planning process/project.

The article is submitted to the *Journal of Land Use, Mobility and Environment* and *ICE Urban Design journal* on November 14th. The comparison of the planning systems in the three countries (NL, BE, SE) is presented as well as conclusions about input to a holistic approach, i.e. where the subsurface can be lifted forward in the current planning systems.

4.3 Summary of the on-line international stakeholder workshop (M2.1)

A summary of the workshop programme and the feedback from the questionnaires is presented in this attachment. The full workshop was recorded; the recording can be available upon request.

4.4 Application of SCORE at Fixfabriken. Draft Master thesis by Rita Garcao.

The report describes the method and the assumptions used for carrying out a CBA and the full SCORE analysis for the Fixfabriken case study.

4.5 Internship report of Urbanism student Nirul Ramsikor for Deltares.

This report is the testing of a tool that is developed by Deltares and applied to the Case in Rotterdam.

4.6 Internship report of Urbanism student Lena Niël for VITO .
This report is the design for the Alvat case in Flanders.

4.7 Project portfolio by Judith Gaasbeek Janzen.
This report is the result of the course AquaTerra Urban Design for case in Rotterdam.

4.8 Project portfolio by Janneke van der Lee
This report is the result of the course AquaTerra Urban Design for case Fixfabriken.

4.9 Subsurface potential map by Sanne Mooij
This map is invented by Peter van der Graaf in his graduation about Scheveningen, Sanne also made one for her case in Rotterdam.

4.10 D3.2 Advice for the Merwevierhaven
This report contains deliverable D3.2 Advice for the cases in national language (Dutch) for the Dutch case study.

5 REFLECTIONS AND COMING WORK

5.1 Reflections

The project team in BALANCE 4P consists of experts and researcher with different backgrounds and knowledge, ranging from economics, soil science, engineering, land management, urban design and urban development. The approaches typically used and applied by the members of team also differ, from quantitative method development to process-oriented approaches.

Further, the processes that lead to decisions are typically rather different in the remediation sector compared to the urban planning sector: in urban planning focus is more on mediating between different interests to reach an optimal solution, whereas often in e.g. soil contamination issues, there are rather strict guideline values to comply with. The decisions related to these different sectors are typically also governed by different regulations. We see it as a strength of this project, to draw on the experiences and knowledge of each member of the team and to learn from each other to reach new insights in the described problem area of brownfield redevelopment and urban planning.

The cases we are investigating and testing different approaches on are rather different with regard to sub-surface conditions, ownership relations, development visions and governance. Although working with cases takes a lot of efforts with regard to e.g. communication, it gives invaluable input to method development and the possibilities to produce meaningful and relevant conclusions and recommendations.

5.2 Coming work

The work during the spring will focus on the concretization of the decision process framework. The work includes writing a scientific manuscript with the holistic approach and the framework (D6.1) and a more detailed guidance to the framework (D6.2). The framework will need review from stakeholders in the different countries (M6.1 and M6.2), and we aim to do this by means of an on-line seminar (similar to what was done in November, M2.1) by the end of spring 2015. In addition, we aim to write an article in a planning magazine for Swedish practitioners.

6 ATTACHMENTS