Site Closure and Redevelopment - A cumbersome journey over obstacles and pitfalls

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Contents

General trends

- Industry concentration
- Site closures
- Spatial development plans require upgrading of former industrial areas to light industrial/commercial/residential
- Paint factories traditionally built in close vicinity of residential areas

Belgium: Paint factory 1

- Historical wetland close to Brussels in a river valley
- Initial industrialization around WW1
- Wetland filled up with material from unknown origin
- Production of fertilizers until ~1925
- Gypsum waste stockpiled
- 1926 Acquisition of land and buildings by a private Paint Company
- 1970ies relocation of creek through the property, equalization of the area, other earth movements and reconstruction of buildings
- 1992 AN took over as part of Nobel industries
- 1994 Activities stopped, plant closed
- Site extends half to Flanders half to Brussels
- 1993 Flemish soil decree puts remediation duty on pollution-causing landowner
- Site could not be divested due to lack of a soil certificate
- OBO en BBO revealed presence of mineral oils, heavy metals, chlorinated solvents, cyanides
- Between 1995 and 2007 dispute with OVAM about responsibility for cyanide
- AkzoNobel could prove that cyanides are historic waste deposits from gas works
- Flanders province accepts remediation obligation, but wishes to excavate
- Brussels is satisfied with control of cross boundary migration
- 2007 AN received order to pay a non utilization tax for their buildings
- Sales/purchase negotiations going on since nearly 10 years
- Current status: Uncertainty about the timing of cyanide excavation in flemish part

Belgium: Paint factory 2

- 1911 - 1970 South part of area: Gelatine and phosphate production
- 1924 in North part start of paint and varnish production
- 1926 - 1956 Animal bones processing for raw materials in the gelatine and phosphate industry
- 1970 Paint factory bought South area for expansion through all 70ies, mainly waterborne products
- 1985 AkzoNobel bought the Paint company
- Mid 90ies restructuring led to land transactions. These required soil certificates. AN started OBO, BBO, Remediation investigations, Remediation plans, Remediations.
- BTEX remediation close to finalization; new spills from new owner mix with old spills
- 2 CHC plumes migrating off site. Origin of the South one is probably the ancient bankrupt animal bones factory
- North factory partly surrounded by residential area
- Nuisance and damage claim issues with neighborhood during demolition of buildings and excavations
- Major communication efforts put in place

Denmark: Paint factory

- Factory for industrial coatings in industrial area
- Former Gas station in the 1920ies
- ~30 USTs of different age
- 2003 Plant closure decided, site management started sale negotiations.
- 2005 Plant closure postponed because of fire in another plant
- EA issued warning notice
- AN accepted to excavate tanks
- 2009: Rezoning plans of city postponed
- Remediation targets unclear
- Redeveloper insisted to buy the area at previous price
- Currently no attractive development possibilities due to zoning plan restrictions
- All activities interrupted due to future use unclarities

Abandoned Paint plant in Germany

- Former paint plant in industrial area divested to automotive OEM supplier in mid 1980ies
- Indemnification in sales contract to buyer
- Insured case
- BTEX contamination on site mixes with CHC plume from adjacent areas
- >20 years legal dispute between authorities and insurance
- After >2 years agreement reached for choice of ChemOx approach for free phase treatment

- Spain Paint plant closure
- Paint factory close to beach at Mediterranean sea
- Area redevelopment for residential purpose

- Selling contract agreed before Spanish S&GW legislation came into force
- Buyer indemnification agreed to a fictive remediation scenario
- Uncertainty how to deal with off site effects
- Stringent criteria for groundwater quality

France: abandoned Fibres site

- 1980ies Plant for Viscose/Rayon closed in France
- Industrial part divested, onsite landfill kept in purpose created legal entity
- Landfill partly capped to standards applicable in early 1990ies
- Dispute pending with authorities about scope and targets for remediation/containment
- Land redevelopment highly unlikely in foreseeable future
- Security issues problematic

Common problems

Situation close to residences:

- Nuisance during redevelopment
- Contamination of soil, groundwater, building substance
- Employment loss in vicinity of sites
- Unorganized pre-closure phase: loss of
- documentation (drawings, historic files)
- site specific knowledge/information
- Lack of Company routines
- Lack of dedicated staff
- Sometimes hostile environment (administrative, social)
- Unclear market conditions
- High upfront costs for demolition and cleanup
- Tax issues (VAT deductibility...)
- Interest divergence inside company
- Need to involve and coordinate external resources from abroad

Economic issues

- Realize maximum value at minimum expenditures:
- Real estate valuation
- Decommissioning and demolishment costs
- Public interests
- Investor interests
- Market knowledge
- Valuation of uncertainties
- Local contraints
- Resource constraints

Legal issues

- Uncertainties concerning liabilities
- Lack of trust of potential buyers
- Difficulties to formulate clear indemnities
- Adequate knowledge and experience of involved lawyers and other internal experts

Environmental issues

- Difficulties to predict project duration and cost
- Surprises during process
- Moving targets
- Decision processes within regulatory authorities
- Decision processes within company
- Involvement of Local management, Legal, Corporate management, Financial/ Tax dept, PR dept
- Major learning
- Many problems created in the past by inadequate site closure and divestment management
- Benefit from central/corporate specialized involvement in remediation planning and negotiation with authorities recognized

Next step is integral site closure management at corporate level

Conclusions

- Importance of multidisciplinary involvement, internal and external is crucial
- Sale/purchase agreements need careful consideration
- Unclear indemnifications and hypothetical scenarios should be avoided
- Time horizons should e clearly identified.

SITE CLOSURE
The example of the Umicore site in Viviez, Aveyron, France

Location and history of the site

The site is located in Viviez, in the Department of Aveyron, S. France. The site is located in a small steep valley.

Activities started in the mid 1880's as a primary zinc refinery through pyrometallurgical processes. Later, the production of zinc based chemicals for the paint industry was added.

In 1930, the pyromettallurgical process was ceased and replaced by the hydrometallurgical refining process.

The reason for installing such an activity in that area, was the nearby presence of energy sources (coal basin of Decazeville), the presence in the region of Zn-Pb ore deposits and the presence of a railroad which made it possible to bring concentrates from more remote regions (Cévennes).

Activities

The operation typically consisted of a roaster in which the ore was calcinated in order to free the metals from the sulphide context. Initially, sulphur dioxide was emitted freely in the air, later the gases were captured to produce sulphuric acid.

Roasted ore was then heated to allow the Zn to evaporate and to be redistilled again in a pure form. The residue of this pyrometallurgical process was a slag that was simply stored along a hill slope behind the plant.

The later hydrometallurgical process consisted of putting into acidic solution the calcined ore. The valuable metals were separated from the solution through an electrolytic process. Waste generated by this process is a typical acidic iron rich sludge, called goethite, that was pumped into ponds.

Because of the lack of open space those ponds were built on Umicore land in a nearby narrow valley. The ponds were not lined. Lead sulphate was also produced as a minor waste stream and put into the ponds.

Both the primary pyrometallurgical and the primary hydrometallurgical process resulted in pure metallic zinc that was the primary material to manufacture end products such as gutters, roofing sheets…

Finally, the Zn-chemicals activity generated a white residue that was stored, unlined, on another plot of land that belonged to the company.

Site closure

In the mid 1980's, it was decided to close down the primary zinc refining activity. The reasons for that were :

- difficult metals market
- difficult location, with no space to store waste safely
- closure of the nearby coal mines
- closure of the Pb-Zn mines in the surrounding areas
- Transport costs, both for importing primary material and for exporting finished products

Because of the sudden closure of a lot of industrial activities in the same period, the entire region underwent a real social drama. Therefore, the company decided to keep on site a small activity (Zinc rolling mill, still operated by Umicore) and to create other activities such as recycling of plastic bags, manufacturing of Al-windows... Those activities are still in operation.

All former installations (hydrolysis, roaster…) were demolished, but the waste heaps remained in place. The waste heaps and ponds were found to release unacceptable amounts of metals (mainly cadmium) into the environment, especially to the surface water.

The remediation project

In 2003, Umicore decided to tackle the contamination mainly caused by :

- soil contamination at the nearby railway station, due to the former storage of ore
- surface water contamination due to the presence of the zinc chemicals waste heap
- surface water contamination due to the presence of 3 sludge ponds
- surface water contamination due to the presence of the slags stored uphill. Within those slags, small ponds were excavated to store lead sulphate

All waste heaps will be excavated, inertised and stored in a newly to construct landfill. More than 1 million m^3 of waste will be removed and stored again, safely. Excavated material out of the ponds will be transported by conveyor belt across the valley in order not to disturb too much the inhabitants because of excess truck traffic. The total length of the conveyer belt is approximately 2 km. 2.5 km of road need to be built in order to transport the zinc chemicals waste to its final destination.

A first phase of the project consisted of the excavation of the contaminated soil at the nearby railway station and was completed in 2007. The cost of this pre-project was 4 Million €.

The second, most important phase of the project will start soon.

Obtaining the final permit : a winding road along different stakeholders

Because of the magnitude of the Viviez remediation project, with activities that will impact the day-to-day business of the commune of Viviez (at least for the duration of the project), a lot of stakeholders were involved in the decision making process of obtaining the final permit.

In the first place, numerous administrative bodies had to be consulted and had to give their comments and final approval. DRIRE, currently DREAL, and the "Préfecture" were the main administrations to negotiate with, but even institutions that are in charge of the quality of the blue

cheese, Bleu de Causse, were consulted in order to make sure that the proposed project would have no adverse impact on the quality of the cheese production.
Stumbling blocks were the staff rotations at the DRIRE and the “Préfecture”, resulting each time in a re-presentation of the project. It goes without saying that the creation of a climate of trust with those stakeholders was the corner stone for successful negotiations.
From the beginning, the project was supported by the water agency (Agence de l’Eau Adour Garonne), even with financial subsidies, amounting at approximately 5% of the total remedioation cost.

Equally important were the local stakeholders, such as the major of Viviez and the surrounding communes (Aubin, Decazeville…) and the entire population. Although informal information of the local community happened rather early in the process, the formal communication campaigns were launched early 2009, once the scope and extent of the overall project was known. The local communes had to give their approval on the project, especially since a new landfill class 1 will be constructed.

Finally, also our own Umicore staff had to be officially informed.

In order to maintain a high level of smooth communication with all the stakeholders, also once the works will start, Umicore has appointed a dedicated person in charge of any interaction, including with the press.

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The project will start soon after having obtained the permit end of August. So far, Umicore received positive press for its initiative, which was taken on a voluntary basis. With a foreseen cost of almost 40 mio €, it turns out to be one of the major private remediation projects in France.

ENVIRONMENTAL LIABILITY TRANSFER FOR SITE CLOSURE: THE NICOLE BROWNFIELD WORKING GROUP PERSPECTIVE

Introduction

The NICOLE **Brownfield Working Group** is conducting research into environmental liability transfer from industrial land holders to brownfield users across Europe. The group will share its findings relevant to the site closure context.

Abstract

A key consideration for site closure is environmental liability transfer. Organisations closing facilities are sensitive to the possibility that, even with safeguards in place, it could be possible for a post-divestiture contamination problem to end up back with them. Unlike the sale of many assets there can be a continuing liability associated with the sale of land in line with the 'Polluter Pays' principle common in European environmental law. Such liability can 'bounce back' to the original polluter. This can be a key element of the decision whether the gates of the former factory site remain locked, or whether the site is bought back into a new productive use.

Site owners would benefit from knowing the implications of their site being classified as a brownfield. Most closed sites would normally fall into one or more of the wide variety of brownfield definitions in use across Europe. In some jurisdictions such classifications have positive implications in terms of for example planning or tax breaks, whereas in others it might mean additional regulatory hurdles or stigma to overcome.

Whether a site is put back into productive reuse depends to a significant extent on market conditions for brownfield redevelopment in the host country, and these vary markedly across Europe. At one end of the spectrum the UK is in a unique position with its dynamic and highly incentivised market. Others have for an array of reasons (e.g. population density, industrial history) not prioritised brownfields and have fragile and tentative markets. Between these extremes an array of market conditions have been established. These different market conditions and their implications for site closure decision making would be presented.

The most frequently used mechanism for land transactions in the EU is *'sold with information'* sufficient for a purchaser to take a view on risks. '*Sold as seen'* with no information (buyer beware), the riskiest approach, is still used surprisingly frequently, but is strongly avoided by many countries. Liability transferable by statute can be important for safe divestment but is in play in only four of the fifteen countries studied. There are many liability transfer mechanisms available, including some highly sophisticated methods, but only a few are frequently used, and there is considerable scope for more complete approaches to be adopted.

The research has identified a highly variable approach to liability transfer in Europe. In some member states it is routine and highly regulated (this is best exemplified by the approaches prevalent in Belgium). In others it is rarely considered in depth and may not be well thought through or controlled. In general across Europe contamination responsibility is rarely comprehensively transferred; non or partial transfer is much more normal. General and country-specific guidance on liability transfer for site closure based on the research findings would be presented.

The research of the Brownfield Working Group is on-going and will be more fully developed by November. There are plans to have draft versions of the groups key deliverables ready by then

These deliverables are the ‘Road Map’ pointing the way towards environmental liability transfer in Europe, the ‘Signposts’ Q&A guide to European liability transfer, and the ‘Atlas’ of transfer in different jurisdictions. Aspects of the deliverables relevant to site closure would be shared.

Presentation

The paper would be presented by Ian Heasman of Taylor Wimpey UK Ltd.

PAPER STRUCTURE

What is Environmental Liability?
Why is environmental liability transfer important for site closure?
Environmental liability transfer in Europe - NICOLE Brownfield Working Group Project
Project Results

- Survey of 15 EU Administrations
- Brownfields, Markets and Incentives
- Legislation and Liability Transfer

Conclusions

REUSE IN DEMOLUTION

CASES

Two real world cases will be presented. The objectives for both cases are site closure, demolition and handover procedures on brown field sites.

Case 1: Concrete element manufacturer

Case 2: Chemical production plant

STAKEHOLDERS AND SHORT PRESENTATION

Case 1:

Investor/seller: Private company

Buyer: Danish municipality with Grontmij I Carl Bro as consultant

Authorities: Municipality and region (environmental authorities)

NGO: Birdwatchers and nature preservation

Neighbours: Industrial and private inhabitants

The site handover/closure was negotiated and written down in a document called demolition agreement (DA). The site should at the expense of the seller be cleared for any structures including UST and concrete foundations. As a sustainable approach all clean concrete and brick elements should be left crushed on site for reuse on site development by the buyer.

No handling of contaminated soil should be included in the contract, unless special agreements were made.

Case 2:

Seller: The site is owned by a large North European chemical company. The owner is presently performing site closure and demolition of building etc. prior to the handover.

Demolition contractor: The demolition activities are being performed by a contractor under the supervision of a consultant working for the seller.

The buyer: The buyer of the property is a property developer with Grontmij I Carl Bro as technical consultant.

Authorities: Municipality and region (environmental authorities)

The site is a former chemical production plant located on a 14 ha property. The property is situated on a harbour location close to the city centre and close to commercial and housing areas. The site is expected to have a high development value and the plan is to redevelop the property into an area of mixed residential, commercial and cultural use.

A legal contract for the purchase has been signed by both seller and buyer. Site closure procedures are only briefly mentioned in the contract. The handover of the property will be made when the site closure and demolition activities are finished.

The site is heavily polluted due to more than 100 years of industrial activities. No clean up activities are included in the site closure and handover procedures.

IMPORTANT ISSUES

Handling and recycling of polluted building materials – crushed concrete etc.

In case 1 asbestos, PCB and oil contaminated building materials should be handled. The site was known to be contaminated but not described in any details, so the seller had to convince the environmental authorities that the demolition did not enhance the leaching of contaminants. The buyer wanted a smoothened surface, thus implying a lot of soilhandling (contamination mixing?) while the seller was not prepared to prove the purity of the soil. The crushed concrete should serve as reused materials in the brown field development, and should be “clean” for this purpose.

In case 2 the demolition contractor is selling large quantities of crushed concrete from demolished buildings and foundations. In the demolishing permits there are no requirements of environmental control of the materials being sold. We recently analysed 10 samples of the crushed concrete showing moderate-high concentrations of heavy metals, PAH’s and heavy hydrocarbons. The materials are now spread over a large number of locations, where the materials have been reused.

Legal/contractual aspects

In both cases it’s the buyer who is planning to redevelop of the sites and therefore has a strong economic interest in securing an environmentally optimal site closure – minimal spreading of polluted soil etc. However it’s the seller who is performing the site closure and demolition.

The legal contracts have proven to be unclear on several points regarding the demolition process and handling of polluted materials. Therefore there have been extensive negotiations between lawyers and consultancies on both sides of the table regarding for instance:

- Levelling of the property after demolition.
- Remediation costs.
- Handling and recycling of potentially polluted building materials.

MOST DIFFICULT ISSUES

Case 1: The DA did describe in details that the seller should obtain all necessary permits to perform the demolition, and crushing of 50.000 m^3 concrete. The municipality was in election mode, so any negative focus was to be avoided. The problem of keeping the crushed concrete clean for reuse was of outmost importance.

The handling of PCB in building materials and as soil contamination was the most challenging as it was the first time in this municipality that serious considerations were made to avoid PCB in building materials for reuse. The breakdown of foundations was handled in collaboration with the three main stakeholders. The rules for disposal of PCB contaminated soil and concrete were not clear, and questions were posed from the Danish EPA to EU for clarification between directives.

Case 2: The unclarities in the legal contract proved to be a challenge during the demolition process. The seller wanted minimal costs while the buyer wanted optimal conditions for the redevelopment.

WHAT ISSUES HAVE BEEN SOLVED IN A HIGHLY CREATIVE WAY

In case 1 we introduced a camera including GIS positioning and camera angle for documentation of contaminated areas to be retrieved after demolition and removal of UST and other potential contamination sources. The concept included a documentation report for the site closure, to be used in future clean-up projects.

In case 2 the development project will lead to the closure of some neighbouring industries and subsequent loss of jobs. This has lead to negative exposure in the local media and the project needs some positive public exposure. The development process is expected to extend over the next 20-25 years. In the mean time it's planed to use the property for various recreational purposes and thereby change the public opinion on the project. Since the site is polluted, various corrective measures are needed before the site can be used by the public. For instance, polluted areas are covered with clean materials or pavement.

WHAT ISSUES WOULD YOU LIKE TO ELABORATE ON IN YOUR PRESENTATION

How an elaborate agreement can be understood very differently from seller and buyers viewpoint. That any agreement made has to be interpreted in reality before the true consequences can be seen. The presentation will give its recommendations on what to avoid in agreements and how to deal with agreements if necessary. An idealised agreement will be presented in points, where to park responsibilities in the most appropriate way.

In case 1, the buyer has spent 7 man month of consultancy keeping up with the sellers handling of the demolition case=spent without any increment in value of the site! How is this avoided in similar cases.

PERSPECTIVE OF THE PRESENTATION

In both cases, the buyer perspective will be presented with good understanding of the sellers challenges and problems. For instance the complex issues of a municipality handling a demolition case, with no incentive to be flexible beyond the regulatory statement.

Use of innovative in-house quantitative risk assessment to determine the requirements for building fabric decontamination during site closure and site sale processes.

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Risk based management of contaminated land is a key policy tool that has been established in many countries. However, the issue of contamination of building fabric is not well established (if at all) and is often either not recognized, not assessed, discounted or approached in a generic manner only. Such approaches can lead to either an underestimate of human health risk (or perceived risk) or over costly 'remediation'. Either can present problems to site owners during site decommissioning, closure or sale processes if not anticipated.

ERM has derived in-house approaches to assist clients during the closure and sale of sites where on-site buildings and building fabric has been potentially or actually contaminated with substances more normally associated with contaminated land risk assessment. The principal examples used are those associated with building internal contamination due to pesticides.

The context for these assessments is from the viewpoint of ERM, acting as a consultant or contractor to an industrial client who is in the process of decommissioning and selling a site to a 3rd party. In most cases the 3rd party intends to re-use the site buildings with minimal alteration, but often for a more sensitive 'non-chemical' future use. Therefore the purpose of such assessments are to reassure both vendor and potential buyer that relevant building contamination issues have been identified and addressed to the satisfaction of both, and that this is recognized and accepted by both.

One recent ERM case study includes sites where buildings were formally used to manufacture and store various pesticide products and where site decommissioning and closure was underway, and site sale for future non-pesticide / non-chemical use was planned. ERM derived in-house quantitative human health risk assessment tools to assess the significance of building fabric surface pesticide concentrations and the need (or otherwise) for remediation. In one example, remediation was required and ERM advised, specified and supervised remediation by environmental cleaning. This is contrasted with another similar site where the client/other consultant had proposed generic remediation by building wash-down, whereas the ERM risk assessment indicated that remediation was not required, and approximately £200,000 was saved by the client.

Similar approaches have also been adopted for pharmaceutical products (cytotoxic dugs) and antibiotics.

The main topics are therefore:

- The innovative use of quantitative risk assessment to guide this process; and
- A brief discussion on the pros and cons of decontamination methods to achieve a verifiable remedial end point in line with that assessment.

Site Closure from a Remediation Solution Provider's Perspective

In the (west) European region, sites are hardly ever closed. Ownership changes and land usage changes but sites themselves remain active. Most countries now have government policies in place that aim to prevent site becoming 'derelict' and rather promote site re-use. With such 'second hand' sites liabilities associated with existing impacts on soil & groundwater are often an issue of concern. Based on examples from a number of sites in The Netherlands, this presentation will demonstrate several pathways to handle such situations. The presentation is given from the Solution Providers Perspective. In all cases, existing soil & groundwater issues block desired property transfers, land redevelopment etc. Solving the issues by full remediation (100.0% mass removal was not possible in these cases (both technically and economically impossible), therefore, the most difficult issue was liability associated with residual contamination. In the cases presented here, this was solved by reducing contaminant levels to concentrations that were (or will be) regulatory accepted for the foreseen (changed) land use. The result is that the previous and new owners have certainty that they will not be required to undertake remediation on the residual contamination, given the planned land use. Liability over and beyond that transfers to the new owner.

Case 1: Service station site: the service station closed years ago, but land redevelopment (to residential use) was obstructed by existing contamination. The matter was solved by establishing a set of agreements: the oil company sold the site, with all liabilities, to an investor, who sold the site subject to completion of remediation to a property developer. GT contracted with the investor for lump-sum remediation to regulatory accepted levels for residential use.

Case 2: Retail property, currently in use as women's apparel shop with residential use on the higher floors in a historic waterfront centre in the west of the Netherlands, has soil & groundwater contamination with chlorinated solvents from a former dry-cleaner. The building (as well as adjacent properties) is a designated historic monument and highly prone to subsidence. The site is for sale, but environmental liability (a proposed remediation plan is based on MNA, which entrails perpetual monitoring) obstructs a deal. GT solved the issue by proposing to use direct injection technologies to chemically and biologically degrade the contamination while also reducing the permeability (already low in clay) to virtually zero. This will reduce migration risks such that once a stable situation is demonstrated, no monitoring will be required.

Case 3: A major chemical firm, a global player, sells production facilities to another (similar) firm. Both seller and buyer want a 'clean deal': i.e. neither wants to be confronted with unexpected environmental liabilities from existing soil & groundwater contamination. The issue is resolved by having consultants from both parties developing a jointly agreed remediation plan (with accepted costs), which is submitted to and approved by the regulators. This process provides both parties with sufficient certainty as to the financial impact of possible liability. A mutually agreed sum is transferred from seller to buyer. The buyer undertakes the remediation.

Case 4: A petrochemical firm plans strategically ahead for possible future divestitures from their existing facilities, or alternatively, major investments to expand and upgrade. Environmental impact on soil & groundwater is the largest, and largely unknown, liability. Presence of contamination as such is not an issue, the unquantified liability is. Developing a Site Soil Management plan (which is submitted to and accepted by the regulators), sets the path forward to handle the existing contamination over the next decades. An approved Site Soil Management plan is a negotiated, legally binding, agreement between the site owner and the regulators. Hence, it facilitates accurately budgeting of environmental expenditure of the next decades.

100 years of industrial history: what's next for the local economy?

By Gaëlle Baldelli, BP

Working with a number of external partners, a project team from BP Remediation Management is working towards enabling the transformation of a former BP Gaz depot and hydrocarbon production plant into a harbour and multimodal transportation platform in the North of France.

The former BP Courchelettes/Corbehem sites were operated from 1863 to 2004. Global size of sites is approximately 20 hectares. Activities conducted included: tank filling operations, storage of raw and refined hydrocarbon products, manufacture of refined petroleum products and specialty chemical and gas storage. In 1944, the sites were severely bombed. Additionally, acid tars, a material from refining processes, were stored on the Courchelettes depot site.

Given the scale of the former operation, the redevelopment presents a number of challenges. For a start, the plants had been decommissioned and demolished safely between 2001 and 2004. Several remediation activities took place including : removal or inerting of utilities, removal of underground storage tanks, treatment of groundwater at former wharf location via a multi-phase extraction system and via skimming of floating product in the former depot area. Soils were excavated and treated by bioremediation at the former pumping station area, former wharf and at several other locations based on risk assessment results. The final remediation of the site will include the management of the former acid tar lagoon. Some longer term monitoring activities will still probably need to be conducted on the sites.

Over the years, the project team has assessed the potential redevelopment options – amongst others the creation of a solar plant. Osartis project is now the most viable option. Therefore, working in partnership with Osartis, Etablissement Public Foncier (EPF) and the regulator, BP is planning to progress the site redevelopment into a project called "Port Intérieur Corbehem Osartis". If successful, this will increase significantly the regional economic activity and will redevelop the former industrial sites. The aspiration is the creation of a harbour and of a multi-modal logistic platform with a European dimension including linkage to Canal Seine-Nord: “680kt/a harbour and 100kT/a of rail freight on an area that covers about 35ha”.

BP is now working towards transferring the sites to EPF in the framework of the French regulation and BP governance process. Sharing information and lessons learned is crucial to BP project management process. Therefore the BP French team looked at other similar redevelopment projects in the company and is trying to apply effectively the relevant procedures learnt; in particular from recent Coed D’arcy project in Wales (UK).

The project took a major step forward in 2009 when negotiations were initiated with EPF. Legal agreements will be signed with a vision to contribute actively to the new Port. Clearly there is still much to be done, but the project looks to enable not only an exemplary Brownfield redevelopment project in complex French environmental legislation but also a technical solution for acid tar treatment.

LIFE AFTER CLOSURE

Background

As the industrialised nations of the western world evolve to meet new market demands and the globalisation of trade many are left with the legacy of decades of industrial decay and dereliction. In many areas new industries require completely different property solutions, gone are the substantial plants making steel, mining coal or making cars – instead we have call centres occupying a fraction of the land previously needed.

A financial services company with a thousand staff potentially needs only a few hectares for their offices as opposed to perhaps several hundred hectares previously used by a manufacturing plant employing the same number!

This ultimately means a major shift in land use patterns. Even if the new business can be tempted to invest on or near the previous business due to the availability of the workforce what happens to the surplus land?

Many companies closing plants, certainly in the UK initially, approach the open market seeking purchasers for their interests. Some times this works, some times particularly in the old industrial heartlands of the UK it doesn't.

Perhaps if lucky small parts are cleaned up and sold for development, but then what?

Does the land remain derelict in the company's ownership causing blight to the local community or does it offer an alterative.

With a little effort, imagination and thinking outside the box these redundant sites can become a positive asset and benefit to local communities.

Location

This paper will consider a portfolio of sites in the former Yorkshire coalfield area of England closed in the 80's and early 90's.

Stakeholders

Stakeholders involved in this portfolio of sites included the departments of the UK Government, English Partnerships, now the Homes & Communities Agency, the Land Restoration Trust, Forestry Commission and Coal Authority.

Issues around site closure

The principle issues to deal with were lack of demand for future use of sites and high levels of deprivation in neighbouring communities.

Solutions

Previous solutions would have involved "greening" of former coalfield sites and leaving them to nature. This would eventually have resulted in greater blight to community and lack of community ownership and greater deprivation.

The work of the Trust however is to ensure that these sites are returned for active use by communities and are now seen as assets to the community.

Presentation

Through this presentation I would like to explore the decisions that can be taken through site closure which can aid future use of a site if there is no economic use. We will look and consider social and environmental benefits that can be obtained from closed sites at limited costs to the companies involved.

The paper will be presented from the perspective of the Land Restoration Trust, who have pioneered the re-use of land for community benefit with suitable funding available for long term management.

PPP: An efficient solution for a complex site closure in Belgium

In the 1970's, Domo Services Gent NV ("Domo"), a textile manufacturing company, acquired a textile factory from the company Fabelta after bankruptcy. In the 1990's, Domo programmed the divestment of a part of its manufacturing site located along the Upper Scheldt River and the E17-E40 highways in Ghent (Belgium).

The concerned area is a 42 ha fallow land on which five industrial lagoons containing 175.000 m³ of viscose sludge were located. These uncontrolled lagoons have generated groundwater pollution with heavy metals and other organic compounds over an area of more than 7 ha. Domo, as site owner and current operator, was considered by the local authorities as liable for the pollution. The remediation costs were estimated at 11 M€.

Because the waste material was brought in the lagoons by a previous operator on site, Domo contested the decision of the environmental authorities to lay the *entire* liability on the current owner. But despite of an intricate legal debate about the issue, Domo has always indicated to be willing of taking part of its responsibility providing that the authorities would accept to take part of the risks and to facilitate the property transfer.

In this context a number of questions were raised: Should the remediation be performed by Domo or by the purchaser of the property? How to finance the remediation costs in the context of difficult economical conditions? How to reduce the risk of additional costs in the course of the remediation works? Who selling the property to? How to ensure that the site will be redeveloped and that the project will be in line with the presence of residual contamination? How to ensure liability transfer after a risk based remediation.

In the late nineties governmental organisations in the Ghent region were urgently seeking economical solutions for the disposal of contaminated dredged sediments. Also there was a real shortage of industrial area for the expansion of high technology driven businesses. Taking advantage of these specific local economical demands, DEC, a remediation contractor, Domo, as the owner of the site, and the public authorities have been able to turn the liability into an opportunity.

The solution for the threefold problem (polluted site, need for sediment treatment facility and lack of industrial area) was worked out by different partners in a PPP construction (Public Private Partnership). The public partners are the Province of East Flanders and the city of Ghent. The private partners are DEC N.V. as a remediation contractor and Domo as owner of the contaminated land. The PPP entity, named FASIVER, became the owner of the land and took over the liability for the contamination.

The different partners combined their know-how and expertise and worked out

- the remediation of the site by DEC, pre-financed by Fasiver (at this stage reduced to a participation of the two private shareholders)
- the creation of a temporary sediment treatment facility by Fasiver and its operation by DEC (against a fee to Fasiver), allowing the use of the treated sediments on site for raising the level of the site by 5 m, which was in any case necessary for future development
- the redevelopment of the site into a industrial park for small and medium sized enterprise and high technology driven industry, allowing for a large green belt along the river Scheldt

OVAM, the Flemish environmental authority, although not an official party to the PPP, facilitated the development of the site by taking a pragmatic approach of the remediation in the sense that, to a

certain extent, the remediation could be phased to coincide with income streams from a phased sell of the cleaned parts of the site.

Soil remediation was performed in 2006, after which a groundwater treatment was started for a period of 5 years. In 2012, the sediment treatment activities will be terminated, after which FASIVER will sell the last part of the site to the City of Ghent and the province of East-Flanders that will ensure its further development.

At first sight, public and private partners had contradictory interests. The private partner wants to reduce risks (insecurity of public policy and changing regulations) and increase financial return related to the investment, whereas the public partner wants to diminish financial risks and the financing volume and increase efficiency in execution. Through a public private partnership these opposing interests could be shared in common cooperation. Within the PPP it was agreed that the private partner would bear the technical risks (e.g. lumps sum decontamination using new techniques, applying existing methodologies on a larger scale or under different conditions), the commercial risks (cost calculation, budget control) and would pre-finance the project. The public partner took the final budget risks by accepting to guarantee to take over the decontaminated site at a price that would cover the total remediation costs based on an open bookkeeping and full disclosure of all costs and incomes of Fasiver. The public partner was also responsible for assisting the planning and permits and took part of the associated risks (e.g. delays in planning procedure, negative environmental impact assessment and failure to obtain construction permits).

"Now the Yard's just Scrap and Rubble*…"
Lessons Learned from Site Closure Implementation
Frank Westcott, Associate Director, Brownfield and Regeneration, RSK Group

Several cases are analysed, both from within RSK group and the author's wider professional experience over 15 years, involving closure of UK manufacturing facilities. The paper identifies common problems encountered in implementing site closure, where these resulted in adverse consequences and where solutions were found, and will draw lessons from these cases.

The cases considered are:

- A former railway rolling stock manufacturing facility in the English Midlands, involving plant decommissioning, demolition, site clearance and remediation and redevelopment integrated with site sale;
- A former lead smelting plant in northern England, involving plant closure and contamination assessment;
- A former lead acid battery manufacturing plant in the English Midlands, involving depollution, decommissioning and limited structural demolition, followed by sale of the site;
- A minerals refining plant on the east coast of the UK, involving permit surrender, depollution, regulatory driven remediation and decision making on the future of the site;
- A former ceramics factory in the English Midlands, with historical contamination issues, where the sale of the site funded the relocation of the facility to a new purpose built facility on another nearby site.

Case Study Analysis
Locomotive Works, Derby, UK

Description: 25 Ha site, heavy industrial buildings up to 160 years old. Disused since early 1990s except for legacy activities. Land sale agreement to public sector led urban redevelopment scheme. Closing organisation responsible for vacating buildings, public body for demolition/clearance. Demolished 1994.

Problems:

- Split of responsibilities not clear enough
- Late/incomplete vacation by manufacturing company
- Late decision by manufacturing company to auction old machinery
- Third parties attempting to remove overhead cranes created dangerous conditions
- Last minute preservation order on part of site

Adverse Consequences

- Delay to start of redevelopment project
- Additional health and safety risks from third party works
- Renegotiation of demolition contract due to change in scrap values, extra soft strip
- Use for preserved buildings not considered in redevelopment plan

* Bruce Springsteen, *Youngstown*, 1995

Solutions
- Clear End State Vision related to site redevelopment
- Single point responsibility defined in closing organisation
- Project management and safety management (CDM Regulations) roles combined for demolition work
- New use found for preserved buildings in new Derby College campus

Positive Outcomes
- Redevelopment of area includes hotel, leisure, office and new college campus
- Preserved historic buildings put to sympathetic new use

Lead Smelter, Leeds, UK

Description: 4 Ha site, closed 2003. Closing organisation intended to exit liabilities and cover closure costs by sale of site. Site investigation showed high lead contamination levels and remediation costs identified were greater than land value. Instead of being remediated the site was fenced securely and "mothballed" – remaining a continued blight on the local community.

Problems:
- Unrealistic expectations in closing organisation concerning land value vs closure costs and ability to realise a quick/clean exit
- Lack of budgetary provision for decontamination
- Unawareness/lack of consideration of blight effects on community

Adverse Consequences:
- Inability to sell site, or to exit liability.
- "Gates Shut" approach adopted to avoid crystallising remediation liability
- Ongoing costs (security, property taxes)
- No remediation completed, only new fencing
- Derelict site remains a blight on community after 6 years
- Attempts to lease the site for "open storage" so far unsuccessful

Solutions:
- None

Positive Outcomes:
- None

Lead Acid Battery Plant, Midlands, UK

Description: 5 Ha site closed in 2003. Sale of site negotiated by closing organisation to residential developer. Closing organisation was responsible for removal of equipment, materials and waste prior to sale completion. Closing organisation proposed to use existing (soon to be redundant) workforce to carry out work. However large scale machinery required significant structural dismantling and a specialist demolition company had to be brought in to do this. Specialist advice on HSE issues including CDM Regulations was also required. Wastes included large volumes of lead oxide paste and this was handled by site workforce trained in handling this material and under long term health screening.

Problems:

- Timescales dictated by land sale not required work scope
- Scope of pre closure works not appreciated: significant volumes of lead oxide paste and major machinery items needed removal before completion of sale.
- Third parties removing items of machinery sold by closing organisation created extra health and safety risks
- Skill set of site workforce engaged in closure works not sufficient to complete structural dismantling of large plant
- Site workforce demotivated as they were losing their jobs
- Challenges in co-ordinating site workforce and specialist dismantling contractor – different working cultures
- Interaction of lead at work laws and construction (CDM) laws

Adverse consequences:

- Complex works co-ordination task for closing organisation, significant management attention
- Several challenges for health and safety management
- As a result, high regulatory interest – full HSE unannounced inspection took place
- Increase in cost for closure, mitigated by increase in scrap reclaim value and by land sale receipts

Solutions:

- Clear End State Vision related to site sale for redevelopment
- Entire closure process under single client project manager
- Use of employees limited to their own skill sets
- External service providers used for structural dismantling and HSE advice

Positive Outcomes:

- No HSE incidents
- Decommissioning carried out to program
- Decommissioned buildings handed over to developer on time for demolition/remediation
- Liability transfer successful
- Residential development underway on site

Metal Refinery, E Midlands, UK

Description: 50 Ha site closed in 2009. Two legacy operations remain – CHP plant and by-product plant with long term contract to fulfil. Closure process ongoing – depollution of tanks/pipework and removal of wastes nearing completion. The site was operating under a PPC environmental permit and remediation will be required for deterioration in site condition (acidification) – investigation work just completed. Also historic pollution of undeveloped part of the site.
A potential purchaser has been identified for the site and in parallel with regulatory closure, due diligence assessments and commercial negotiations are ongoing.

Problems:

- Differing objectives and poor communication between different parts of closing organisation
- End State Vision not communicated and complicated by legacy operations
- Regulatory closure and site sale not considered together; timescale objectives conflict
- Lack of communication between service providers
- Disengagement of legacy operations from remainder of site
- Logistics of regulatory closure, eg depollution vs soil/groundwater investigations, demolition vs remediation
- Departure of staff with key knowledge from closing organisation
- Long term management of soil/groundwater impact reliant on effluent treatment operations planned for closure

Adverse Consequences:

- Decision making more complex and may not account for all factors and implications
- Increase in time and cost for closure
- Post closure property tax and utility costs
- Closure and liability transfer impeded by continuance of legacy operations
- Loss of key knowledge of the site
- Cost of necessary changes to long term management of soil/gw impact
- Solutions:
- Solutions are being developed as the project progresses and the End State Vision becomes clearer.

Positive Outcomes:

- Positive outcome being sought involves establishing legacy operations as autonomous activities and disengagement from remainder of site with liability transfer to developer.

Ceramics Factory, Midlands, UK

Description: 3 Ha site. Closed in 2005 due to relocation of activities locally to modern facility. Closure and relocation costs to be paid for by sale of site for housing redevelopment. Historical contamination by chlorinated solvents and hydrocarbons required remediation as well as decommissioning and demolition, however timescales compressed due to site purchaser (housebuilder) requirement for early start to building.

Problems:

- Compressed timescale objectives (quick sale, early build start)
- Interface between demolition and remediation
- Scope/extent of remediation works needed
- Requirement for early service provider appointments (remediation, demolition)

Adverse Consequences:

- Closure, remediation, demolition all happening concurrently
- Space constraints on working areas on site

Solutions:

- Clear End State Vision related to relocation and sale of site
- Phased remedial solutions developed to meet timescale needs, integrated into sale agreement
- Closure process under single closing organisation project manager
- Agreed phased closure activity programme
- Joint appointment of turnkey remediation service provider; remediation started before closure
- Co-operation between demolition and remediation service providers

Positive Outcomes:

- Liability transfer and value realisation successful
- Relocation completed to programme
- First phase housebuilding started 2 months after closure
- First house occupancy before completion of last remediation phase
- Remediation finished 3 months early and below budget allowing building programme acceleration

Conclusions

Common problems encountered included: differing objectives within parts of the closing organisation; lack of a realistic end-state vision; unwillingness to invest in order to realise value; inability to agree liability transfer mechanisms; lack of single point responsibility for decision making and project management; unawareness of HSE implications; continuance of “legacy” operations; demotivation of employees involved in closure; degradation of site post-closure due to sabotage, vandalism, arson and theft, and failure to recognise blight effects on wider community.

Summary – Problems

- Differing objectives within parts of closing organisation/workforce
- Lack of End State Vision
- Lack of single point responsibility
- Budgeting, unwillingness to invest to realise value
- Continuance of legacy operations
- Liability transfer/remedy
- Post closure property tax and utility costs
- Failure to recognise blight effects on wider community
- HSE implications of closure actions/vacant buildings
- Involvement of third parties in closure process eg equipment removal
- Role of closing organisation employees in closure actions
- Pollution/liability caused by closure operations
- Demotivation of closing organisation employees
- Post closure dereliction (arson, theft, vandalism)
- Lack of understanding of demolition economics including “reclaim” value

Adverse consequences included: Incomplete closure due to “legacy” operations; incomplete closure where site is secured and abandoned but not redeveloped; inability to realise value expectations due to unquantified risks and liabilities; unbudgeted or increased site closure costs and timescale; unsafe

conditions occurring during closure process or due to trespassers; reduction in value/increase in liabilities caused by closure process; inefficient implementation of closure actions.

Summary – Adverse Consequences

- Incomplete closure due to legacy operations
- Incomplete “gates shut” closure
- Value expectations not realised
- Unbudgeted/increased costs
- Excessive time taken for closure
- Inefficient “piecemeal” closure actions
- Complex decision making
- Increased liabilities
- Unsafe conditions during closure actions
- Unsafe conditions from dereliction of disused buildings (arson, theft, vandalism)
- Loss in value from dereliction of buildings
- Loss of key knowledge of the site
- Continuing blight on community

Solutions found included: early definition of end-state vision; single point decision and project management responsibility; integration of closure actions and budgets into a single project; rigorous activity planning; and integration of legal safety management requirements into overall closure project management.

Summary – Solutions

- Site closure objectives and end state vision should be carefully defined
- Site closure should be managed as any other project or organisational change
- Single point project management
- Realistic integrated budget
- Rigorous activity programming
- Integration of legal safety management requirements into overall closure project management.
- Recognise limitations of employee skill sets and support them with specialised service provider skills where needed
- Closing organisations moral responsibility to facilitate re-use of site and avoid blighting communities

Key lessons learned include that site closure should be managed as an integrated project with the same disciplines and management as any other organisational change, and that closing organisations should recognise the limitations of their skill sets and ensure that site closure actions are in competent hands.

Positive outcomes are dependent on objectives but positive outcomes for site closure projects may include:

- HSE incidents avoided
- Clean exit with liabilities transferred or eradicated
- Realistic value expectations realised
- Budgets complied with and timescales achieved
- Redevelopment avoiding blight on communities

Closure of a site or sites is a uniquely painful form of organisational change. It is frequently a decision of last resort, precipitated by some form of organisational or economic crisis. In the circumstances the focus of the closing organisation is often on its own survival and restructuring, and in the immediate aftermath of the closure decision, meeting its direct obligations to those of its workforce who will have to be let go.

In the circumstance it is inevitable that the closure and divestment of physical assets can assume a lower priority and that key decisions may be subject to delay. The time lag between a site becoming disused, and its return to beneficial use, can extend to years or even decades. During this period the trauma and blight caused to a community by a disused, derelict site has significant adverse social, environmental and economic effects.

In these circumstances it is vital that those responsible for the closure of a site recognise that they have a social obligation to effect a rapid, efficient and effective disengagement from the site, so that it can be redeveloped by others and returned to a beneficial use in as short a time as possible.