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**Case Study: Brownfield**

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# Transforming Ebbw Vale – from steelworks to green space



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The Ebbw Vale regeneration scheme in Gwent, South Wales, is one of the largest and most complex of its type in the UK. When it has been completed, the former Corus Tinsplate Works will have been transformed from an abandoned steelworks into a vibrant new quarter of Ebbw Vale providing new education, healthcare, employment and rail infrastructure for the local population. In all, it will create new employment opportunities for around 1,500 people.

## Background

The Tinsplate Works closed in July 2002 and were demolished during 2004, leaving behind a derelict 90 hectare brownfield site. Seeing its potential for redevelopment as a well-located economic and social hub, the Welsh Assembly Government and Blaenau Gwent County Borough Council, in partnership, produced a development framework designed to regenerate the site.

Central to the plan was the integration of the site into the surrounding landscape, ensuring that any new development would complement both the built and natural environment.



Halcrow Group were appointed as lead engineering and landscape consultants in early 2004 to assess the technical challenges on site and implement a strategy that would ensure that the site

was redeveloped in as sustainable manner as possible. This included ensuring that any construction processes would comply with UK and EU initiatives for the protection of soil, which in turn led to the decision that natural topsoil would not be imported for use on site and that any new material needed to form or replace soil would be sourced locally.

## Phase One

Overseen by Halcrow Group and with support from WRAP's Landscape & Regeneration programme, a strategy for the manufacture of replacement topsoil was put in place by Progressive Restoration and carried out by Edmund Nuttall. The

strategy focused on the use of industrial spoils such as basic steel slag and colliery spoil that were already present on site in significant quantities.

There were, however, considerable issues relating to the use of industrial spoil in the soil formation process, mostly surrounding their lack of organic matter, low nutrient status and inability to retain water. In order to address this issue, Blaenau Gwent County Council asked Progressive Restoration to consider the use of locally sourced BSI PAS 100 compost in the soil manufacturing process.

Investigations showed that BSI PAS 100 compost – a nitrogen, potassium and phosphorus rich material – could be mixed with the colliery shale at ratios of up to 4:10 (compost to soil) to produce suitable topsoils for use on the site. Progressive Restoration also found that other waste minerals such as glacial till, steel slag and gritstone fines could be blended with compost, thereby ensuring the reuse, rather than disposal, of on-site material.



## Results

In August 2007 Edmund Nuttall manufactured soils ex situ (off site) in batches of no more than 250m<sup>3</sup>. In total 65,000m<sup>3</sup> - nearly 100,000 tonnes - of topsoil were manufactured using BSI PAS 100 compost to create 20 hectares of urban green space, which includes a significant proportion of woodland.

Monitoring continues but early results suggest that the trial has been a success. The technical challenges presented by a lack of suitable topsoil have been overcome and the impressive growth of vegetation proves that BSI PAS 100 compost has significantly

improved the quality of the soil, allowing it to support the development of green space.

## Phase Two

Given the heavy industrial past of Ebbw Vale, soil contamination was another issue faced by developers on-site. Extensive hydrocarbon contamination as a result of steel production had left some parts of the site in need of treatment in order to reduce the level of pollutants in the soil. To do this, WRAP commissioned ExCaL Ltd to investigate and compare the use of BSI PAS 100 compost and immature green waste compost in the bioremediation of hydrocarbon contaminated soils.



waste costs.

Successful bioremediation with compost would enable the contractors working on site to reuse rather than dispose of contaminated soil, meeting the sustainability requirements of the project and facilitating a reduction in

The ex situ bioremediation programme involved the construction of two biopiles. Each biopile was constructed to an approximate volume of 250m<sup>3</sup> and three perforated pipes were incorporated along the length of each biopile, the ends of which were left open to allow drainage.

The first biopile was constructed with the polyaromatic hydrocarbon and petroleum hydrocarbon contaminated soil to which immature green waste compost was mixed at a ratio of 3:1 (contaminated soil to compost). The second biopile was constructed using the same batch of contaminated soil and BSI PAS 100 compost, and mixed to the same ratio. Both biopiles were

then covered with a geo-synthetic membrane. The remediation process was analysed for 11 weeks from March to June 2008.

## Results

ExCaL analysed both biopiles against a series of key performance indicators - these included temperature, pH, moisture, nitrate and phosphate levels, and both total polyaromatic hydrocarbon and total petroleum hydrocarbon contamination. Although variations in performance were noted during the 11 week period, contamination levels in both biopiles dropped by nearly a third from their original levels.

Consideration was also given to the cost and quality of the material used. Although immature green waste compost costs marginally less to import on a large scale, it does not have the quality assurance that BSI PAS 100 compost carries. In the bioremediation trials, the use of quality BSI PAS 100 compost allowed ExCaL to better predict remediation timescales, making it a more consistent and reliable option for use in this application.



## Conclusion

Findings from both the soil manufacture and bioremediation trials at Ebbw Vale confirmed that BSI PAS 100 quality compost can play an important and successful role in the effective decontamination and restoration of large scale brownfield sites, and make significant cost savings in the process. When compared to importing topsoil, using BSI PAS 100 compost to manufacture topsoil saved Blaenau Gwent County Council £450,000 – or £15 per square metre of manufactured topsoil.

Ebbw Vale project manager, Nigel Bending concludes: “We wanted to employ a strategy that would ensure the reuse of soil on site – whether it was contaminated or poor quality – and thereby reduce the amount of waste produced by the project. We also wanted to make sure that we sourced as much material as we could from local suppliers so using BSI PAS 100 compost made both practical sense and enabled us to use a recycled product in our programme of soil restoration.”

### Key Facts About Compost

- Compost is an excellent source of organic matter. It gives soil a more workable structure which leads to improved root growth, water and nutrient management properties, and therefore better plant establishment.
- Compost mulches can act as a protective barrier to the soil surface which helps reduce weeds, retain moisture and control erosion.
- Compost can play a key role in restoring and ‘repairing’ soil on brownfield sites and makes an ideal component in topsoil manufacture where existing soil may be scarce or of poor quality.

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