

# Materials Resource Management Contract

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09/05

## MRMC site visits

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### Visits to Herhof MBT plant

#### 1. Date of visit

Thursday, 16<sup>th</sup> September and Friday, 17<sup>th</sup> September, 2004

#### Names

- Steve Waight, Cabinet Member for Strategic Planning and Environment, WSCC
- Phillip Russell, Head of Wastes Management Services, WSCC
- Tracey Taylor, Senior Planner, WSCC
- Kate Stacey, Project Officer, MRMC, Wastes Management Services, WSCC
- Accompanied by Dr C Eberhard Gruneklee, Project Manager, Herhof Umwelttechnik GmbH

#### 2. Date of visit

Tuesday 30<sup>th</sup> November and Wednesday 1<sup>st</sup> December, 2004

#### Names

- Phillip Russell, Head of Wastes Management Services, WSCC
- Chris Cousins, Head of Planning Services, WSCC
- Julie Wilkinson, Wastes Strategy Manager, WSCC
- Peter Green, WSCC Cabinet Member
- Frank Wilkinson, WSCC Cabinet Member
- Alan Philips, WSCC Cabinet Member
- Accompanied by Dr C Eberhard Gruneklee, Project Manager, Herhof Umwelttechnik GmbH and Avril Banks, Development Manager, Herhof Environmental (UK) Ltd

#### 3. Date of visit

Monday, 6<sup>th</sup> December and Tuesday, 7<sup>th</sup> December, 2004

#### Names

- Kate Stacey, Project Officer, MRMC, Wastes Management Services, WSCC
- Simon Martin, Contracts and Development Manager, WSCC
- Graham Harris, Site Development Engineer, WSCC
- Alex Wojcik, Principal Valuer, Property Services, WSCC
- David Solomon, Crawley Borough Council
- Ian Jopling, Horsham District Council
- Accompanied by Dr C Eberhard Gruneklee, Project Manager, Herhof Umwelttechnik GmbH and Avril Banks, Development Manager, Herhof Environmental (UK) Ltd

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### Sites

- Rennerod MBT plant, nr Frankfurt, Germany
- Herhof Head office in Solms, Germany

### Observations

The plant is contained in an industrial style building in a rural location, adjacent to an old landfill site and is well screened by trees. The plant has two stacks, one as part of the exhaust air treatment equipment, the other as part of dust treatment equipment. Collection vehicles enter the site by a remote computer controlled weighbridge.

### Description of facility

The Herhof process adopts a similar biodegradation approach to Ecodeco. Residual waste is dried and biologically stabilised by forced air being passed through the waste mass. The Herhof process is modular and uses enclosed bio-drying boxes to regulate the process and minimise the effect on the environment.

Herhof started in 1968 as civil engineers. Herhof Environmental builds, owns and operates MBT and In-vessel composting facilities throughout Europe. Herhof have built over 40 in-vessel composting plants (average size 40,000 tons) worldwide, which produce compost from kitchen and garden wastes for agricultural and horticultural use. Herhof have been operating Stablat systems (which produce a fuel) since 1997 in response to German legislation that requires the landfilling of biodegradable waste to cease by 2005 in order to meet and exceed the requirements of the EU Landfill Directive.

On October 6<sup>th</sup> 2003 Treasury Holdings who is an Irish property development company with interests in waste, forestry and wind energy acquired Herhof, together with three large operating plants. The assets acquired by Treasury include the headquarters at Solm Niederbiel, nr Frankfurt, which includes a design and manufacturing facility in addition to administration and financial support services.

Currently Herhof is operating 3 commercial plants in Germany at locations in Rennerod (100,000 tpa, planned extension to 120,000 tpa), Asslar (140,000 tpa) and Dresden (85,000 tpa) and in Venice, Italy processing 150,000 tpa of waste which opened in 2001. Two plants are currently under construction at Trier and Belgium and there are a further five signed contracts across Europe with completion dates scheduled for 2005. There are no operational facilities in the UK although there are proposals in Ireland and Herhof are preferred bidder for the Leyland plant in Lancashire.

The plant at Rennerod has been operational since 2000 and is operated by Herhof Umwelttechnik GmbH, the land was provided by the County. An extension to the plant is planned for 2005 and will include extra recycle preparation equipment. The 15 yr contract is a consortium between Herhof, Mann & the Local Authority (Kreis Westerwald).

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Rennerod construction costs were 25 million euros (approx £17 million) and the operational costs are around £60 to £80 per tonne. At present Stabilat is a negative value material to the plant at around 15 euros per tonne.

The footprint and height of the Rennerod building are: -

- Surface area buildings 5,500 m<sup>2</sup>
- Total footprint of the plant 31,400 m<sup>2</sup>
- Height of buildings 18m
- Height of stack 30m

The average system outputs are: -

1. Recycled (50%)
  - Metals (ferrous and non-ferrous) – ~ 5%
  - Glass and inerts ~ 15% (currently used as landfill cover)
  - Condensate (water recycled in the process) ~ 30%
2. Recovered (50%)
  - Stabilat fuel (a high calorific fuel that can be used for energy generation or conversion into chemical feedstock such as methanol. Used in CHP plant in Asslar, Germany; a cement kiln in Rudersdorf, Germany, a coal fired power plant in Italy and at Schwarze Pumpe Gasification facility to produce methanol) ~ 50%

### Process

#### Stage 1: Biological Stage (biodrying)

After kerbside recycling has taken place (60%), residual waste is delivered to the MBT plant and is placed in the reception pit. Any bulky goods are removed. Odour is managed by internal controls, which ensures a slight negative pressure within the plant, and there is an air curtain system whereby air is drawn into the area to prevent odours when the roller gate to the reception area is open.

A fully automated bunker crane transfers the waste into a primary shredder to reduce the average size of the waste to 200mm and then the shredded waste is transferred by automated grab crane into bio-drying boxes that are made of reinforced concrete. These boxes are generally 30m long by 5m wide and can hold up to 300 tonnes of waste each. Once in the boxes the lid is sealed and the waste remains completely enclosed for 7 days. During this time air is forced through the base of the boxes and through the waste. Each box is individually controlled by a computer system, which gives the naturally occurring microbes in the waste optimum conditions to biodegrade the waste. These microbes create heat and the moisture in the waste evaporates.

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The warm moist air is removed from the boxes and passes over a heat exchanger where the moisture is condensed out and evaporates in an open top cooling tower. The condensate is treated and then used as cooling water. The dried cooled air is then re-circulated back through the boxes. The exhaust air from the boxes is treated through the patented thermal combustion process known as the LARA system (thermal oxidiser) which treats the exhaust air from the plant at 850 °C to ensure all possible odours or pollution sources are eliminated from the emissions before being released into the atmosphere.

### Stage 2: Mechanical refining

Once the waste is dry, the material is removed from the boxes by automated crane and passes through various mechanical separation processes to separate the light from the heavy material, including a mechanical densimetric sorting process. From the heavy fraction ferrous, non-ferrous metals, the inerts and glass are removed and the light fraction is the replacement fuel fraction called Stabilat, which is then transported off site and used for energy recovery. Dust from the process is treated and made into pellets.

### Comments

1. There is a concern that market outlets for the products can be maintained, although Herhof say "they maintain a rolling update of market outlets for their products and ensure that they are not dependent on any one supplier for a particular material".
2. Environmental impact is minimized through the fact that it is enclosed, through the sophisticated dust and exhaust air cleaning systems and the recycling of process waters.
3. It is currently unknown whether the fuel will be eligible for a Renewable Obligation Certificate if used in cement kilns or power plants, however it would be if used in advanced thermal treatment processes such as gasification or pyrolysis.
4. It is possible to further clean up the inerts/glass for recycling, however, it is expensive.
5. In order that the Stabilat can be used in a cement kiln it needs to be made into pellets and to be used in a coal-fired power station a special injection system has to be added.
6. In Germany when treating MSW the use of thermal oxidisers are required rather than biofilters. The Herhof system to control air emissions (the LARA system) has been proclaimed as BAT by the Austrian EPA.
7. In Germany there is no stigma regarding chimneys, unlike in the UK eg the Leyland plant stack height has been designed to be less than 5 m above the building and it is hidden by building the sides up to look like a tower.
8. The biomass content of the Stabilat is beginning to be able to count towards renewable energy. This coupled with the emissions trading regulations which require significant reduction in the CO2 emissions from key energy using companies might enable beneficial contracts for the use of Stabilat to be developed.
9. The Stabilat fuel produced has a high CV ie CV 17,000 KJ/Kg compared with coal 22-33,000 KJ/Kg.
10. The Stabilat from Rennerod is transported 500 km to be used for energy recovery, but to put this into context Chinese or S.African brown coal is used.
11. On all visits to the plant the level of waste management was consistent.

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### Key Issues

- Traffic appears to be the biggest planning issue and there is a need to analyse the total transport impact compared with other alternative treatment systems.
- Need to look at the traffic impact of getting materials to the plant.  
Need to look at the traffic impact of materials leaving the plant.
- There is more need for information concerning the land take and building design for the scale of plant we would require.
- The system is totally dependent on the marketing of the fuel and other products.
- There is a need to speak to the local Planning and Environment Officers for views on impact.
- A key advantage was that sensible pre-treatment can help increase recycling and reduce landfill need, irrespective of markets for fuel.
- The scale of the building could be in a normal industrial site in some parts of West Sussex.
- There is a need to visit a 'fuel' Power Station to consider the scale of buildings required to meet the needs of fuel produced from such a system.
- We would not imagine such a scenario in the UK as the fuel is transported to a remote (500 km away) Power Station, i.e. the equivalent of going from Bognor to Newcastle.
- The locals faced the choice of providing an incinerator or building the Herhof plant.
- The technology to separate the bio stabilised waste was very clean and efficient.
- There were no odours outside the immediate environs of the plant. (There was a closed landfill site adjacent to the plant).
- The level of health & safety standards of the plant (concerning the operatives e.g. safety clothing, signs etc.) did not seem as high as in the UK.

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### Planning Comments on the Herhof MBT Plant

#### Visual:

- The plant was located in a modern building.
- The plant had two chimney stacks, one of which was 30m high.
- Planting around the site was low key although there were trees on adjacent land

The building worked well in its surroundings; it would not look out of place on an industrial estate (B2 rather than B1). Its setting was quite rural, located adjacent to a closed landfill site, it was away from housing, with good access from the adjoining main road. Planting round the site was low key, however the facility was well screened by adjacent trees/vegetation.

The chimney would have an impact on long views, the height of the chimney depends on variables ie wind, topography etc if the process can operate with a lower, less conspicuous chimney it may reduce local opposition. If not thought should be given to tree planting schemes away from the site to reduce the visual impact of the chimney (as at Chinham).

#### Odour and Noise:

- No noise was noted above a normal industrial process.
- Odour does not appear to be a problem. The building had integrated air emissions control to reduce dust, waste was unloaded under negative pressure to reduce odours.
- The waste was processed quickly which meant that it was unlikely for flies to breed.

#### Traffic:

- As with all waste facilities, the impact of transport on the locality is a major impact concern.
- Care would be needed with access and vehicle movements.

#### **Local Plan Comments**

The type of use could be located on many industrial estates. In principal it accords with policies A1 and/or A1b of the revised WLP, subject to the usual development control policies ie noise, access etc.

The WLP encourages proposals to be developed on brownfield sites, any proposal which is received on a greenfield site would have to demonstrate need, plus what other sites have been considered, why they are not acceptable and why the proposal should be located on a greenfield site.