Revise 2

HAZARDOUS WASTE STREAM – CONSTRUCTION AND DEMOLITION excluding Contaminated Soil[1]

1. BACKGROUND TO THE POLICIES AND MARKET CONDITIONS

Regulatory Background

- Waste Framework Directive (75/442/EEC) as amended by Council Directive (91/556/EEC)
- Minerals Planning Guidance Note 6 (MPG6) – aggregates recycled wherever possible and where technically, economically and environmentally acceptable, construction and demolition wastes should be used instead of primary materials.
- Control of Asbestos at Work Regulations
- Asbestos (Licensing) (Amendment) Regulations 1998
- Special Waste Regulations 1996 (SI 1996/972) and Hazardous Waste Directive (91/689/EEC)
- European Waste Catalogue & Hazardous waste list
- Waste Acceptance Criteria
- Town and Country Planning Act
- Part II of EPA '90
- PPC
- Landfill Tax
- Aggregates Tax
- Environmental Liabilities Directive
- Water Resources Act
- Groundwater Regulations and Water Framework Directive
- Aggregates Levy
- Sustainable Construction Strategy

2. LIKELY FUTURE ARISINGS OF CONSTRUCTION AND DEMOLITION HAZARDOUS WASTE CONSIDERING THE MARKET CONDITIONS AND PRODUCERS RESPONSE TO FORTHCOMING LEGISLATION

"*Data suggests that hazardous waste from the construction industry can be expected to steadily increase at a rate not exceeding 2 percent per annum*" Entec ref: Cambridge Econometrics, 2002.

Waste arising each year

- The total construction and demolition waste has been estimated to be between 90 million tonnes (BDS Marketing & Research) and 72.5

[1] Note that some of data in this paper may include contaminated soil within the category of C&D waste

million tonnes, including soil, stones and road planings (Symonds, 2001*, Construction and Demolition Waste Survey, Research and Development Technical PS368).*

- C&D waste and asbestos landfilled in the UK 1,100,000 tonnes (Babtie, 1998/99) and 998,000 tonnes (EA, 2000).

The most commonly occurring hazardous materials found in C&DW (excluding contaminated soil) include:

- Adhesives
- Asbestos materials
- CFC – refrigerants and foam
- Treated timber
- Emulsions
- Solvent-based concrete additives
- Resins

The scenario forecast as set out in the Entec report shows that the total C&D waste will increase until 2004 then level off. The notable increases were soil and dredging spoil and insulation materials and asbestos.

Asbestos is a significant area that is expected to rise in the future, and should therefore be subject to particular focus. The Babtie report highlights its importance accounting it for five percent of the material going to landfill and asbestos cement accounting for a further 7% - although asbestos cement needs to be further assessed (see Annex 1 for further details). Asbestos was used extensively in UK from 1940s to 1970s for the following uses[2]:

- Sprayed asbestos and asbestos loose packing used as fire breaks in ceiling voids.
- Moulded or pre-formed sprayed coatings and lagging used in the thermal insulation of pipes and boilers.
- Sprayed asbestos mixed with hydrated asbestos cement used as fire protection in ducts, firebreaks, panels, partitions, soffit boards, ceiling panels and around structural steel work.
- Asbestos cement products include corrugated roofing sheets, corrugated sheets for wall cladding, gutters, rainwater pipes and water tanks.
- Millboard, paper and paper products containing asbestos used for the insulation of electrical equipment.
- Asbestos ropes and products woven from asbestos fibres such as cloths.
- Certain textured coating, decorative plasters and paints.

The impact of the Landfill Directive on the management of hazardous waste is unclear. The banning of co-disposal will result in the concentration of

[2] Source: Environment Agency – *NetRegs*

hazardous waste. The landfill operators are likely to reconsider their ownership and management of the licensed hazardous waste sites that currently accept asbestos waste. The cost of asbestos disposal may well increase if the number of sites accepting the waste decline and landfill taxes continues to rise.

However, one area that will need to be explored by the Forum is the variation in the datasets. There is a need for a clear set of base figures for the Forum to be able to start to quantify likely arisings. For example the range at which C&D accounts for all hazardous waste is 30 per cent, with figures at 50 percent and 20 percent from ESA (Annex I: Key Issues) and ENTEC respectively.

"…*The huge discrepancies are in construction industry wastes: This is probably because these wastes occur as one-off arisings associated with development and maintenance of buildings and land, rather than with the services and products of the company occupying the building. If adjustments are made for construction waste, NWS data for solid special waste is around 47% of the SWaT data, a much closer match to the liquid special waste ratio*." Babtie

See Annex II for Table showing hazardous and liquid waste arisings for the UK by Construction and Demolition showing the amount banned hazardous waste properties and the amount of liquid waste.

Considerations:

Producers

- Likely response to regulations
- Assess levels of in-house treatment/discharge
- Assess the quantity of contaminated soil within the C&D and other waste categories in the EWC, the proportion likely to have hazardous properties and the treatment requirements prior to landfilling
- Pre-treatment costs
- Consider alternative materials
- Lack of treatment technology

Waste Industry

- Investment in technology

Regulators

- Increase in controls
- Advice on separation and segregation

Government and Local Authorities

- Targeted grants
- Designate land for developing new treatment facilities

3. POSSIBILITIES FOR WASTE MINIMISATION AND REDUCTION - MARKET FOR HAZARDOUS WASTE FROM CONSTRUCTION AND DEMOLITION

Market for hazardous waste: "*Efforts to recycle wastes are often hindered by a lack of markets, lack of space on site to effectively segregate materials and time and pressures during demolitio*n" Entec report

The European Commission, in its working document on Construction and Demolition waste, suggested that Member States should aim towards combined recycling and re-use targets of 50-75% by 2005 and 70-85% by 2010 (Waste Not Want Not)

Through refurbishment and/or renovation of existing structures in place of new buildings and structures, the industry can reduce waste generation, as is emphasised in the revised Planning Policy Guidance on housing (PPG3). Similarly, planning and early involvement of the suppliers can reduce the quantity of C&DW by specifying materials through consideration of more efficient resource use. Waste materials remaining after construction and demolition can also be reused (either on-site or off-site) to reduce the quantity C&DW going to landfill.

For example[3]:

Waste type	**Reuse example**
Broken Brick or concrete	on-site levelling or filling holes
Cladding material	use to refit another property
Components of old buildings (roof or floor tiles, beams, flagstones)	renovation of similar buildings or new 'mock-aged' construction
Fittings (door & window frames, fireplace)	fit in new or renovated building
Surplus construction materials	return to place of purchase or Use on another site

Greatest potential for minimising hazardous waste rests with segregation and sorting of on-site waste. This would avoid the need to landfill large amounts of waste that may not all comprise hazardous waste but are treated as such due to these being mixed up with hazardous waste.

Considerations:

Producers and Waste Industry

- Possible increase in R&D in pre-treatment
- Changes to waste management practices
- Development of new materials
- Segregation and pre-sorting of wastes

[3] Source: www.wasteguide.org.uk

Waste Industry

- Potential impact on waste minimisation

Government and Regulators

- WRAP – Increase the market for hazardous waste
- Encourage R&D spend
- Envirowise to raise awareness of alternatives and provide advice for creating market demand

4. ASSESS THE TREATMENT AND DISPOSAL CAPACITY FOR THE FUTURE FOR HAZARDOUS CONSTRUCTION AND DEMOLITION WASTE

Assess the influences that have been outlined in 1, 2, and 3 and the subsequent influence on the requirements for merchant facilities. This would involve the type of facilities and the capacity in which they should exist.

Calculate the effect that increases in off-site treatment costs for construction and demolition wastes would have on the market for in-situ remediation techniques.

Alternative Treatment routes for Contaminated soil / C&D waste:

- Stabilisation/Solidification processes
    - (ESA) has the potential to treat up to 525,000 tonnes of contaminated soil depending on the type and degree of contamination present. This practice usually goes to landfill in Europe
- Direct Landfill
- Bioremediation
- Vitrification
- Thermal Degradation (for example in asbestos – economics from ENTEC – because of bagging for landfill has been the UK practice, there is no experience of this technique. Whether it is the BPEO for asbestos would depend upon the assessment of the energy requirements of the process, and the risks of release in transport and processing.

"*The price charged for contaminated soil disposal rarely reflects whole-life costs of disposal, but rather the state of the market, and the need for the waste management companies to maintain volume and turnover at landfills to meet business targets. One larger operator recently raised prices by £2-3 per tonne, and lost substantial volumes of waste business as a consequence*"
Entec (industry source)

Considerations:

Producers

- Improving waste management practices
- Seeking alternative materials
- Facilities for pre-treatment
- Segregation & sorting

Waste Industry

- Increasing suitable hazardous waste capacity for treatment

Regulators

- Allow reuse of waste where possible

Government

- incentives to increase capacity – i.e. tax credits, rebates
- research into alternative disposal routes
- maximise opportunity to reuse waste where possible
- Introduce incentives for segregation of waste on-site

5. KEY DECISIONS TO BE MADE BY:

Producers

- alternative methods for treatment
- use of alternative materials
- segregation & sorting

Waste Management Industry

- investment in new technology

Government & Regulators

- Incentives for producers and waste management industry
- Increase treatment capacity
- Provide short and long term solutions to enable compliance with regulations taking account of available capacity
- Consider Targeted grants and rebates for waste minimisation

Annex I – Asbestos Cement

Taken from Implications of the Landfill Directive on the Disposal of Hazardous and Liquid Waste in the UK. DETR (2000)

Asbestos cement is not on the current Hazardous Waste List or included in the proposals for additional hazardous categories in the integrated List that are due for ratification in December 2000, but discussions are taking place about its inclusion as a hazardous material at some later date.

Currently, asbestos fibre is wetted and bagged prior to landfill at present to prevent inhalation of the fibre during transport and disposal. If this is acceptable as "treatment" for the purposes of the Landfill Directive on the basis that it significantly reduces the major health risk, and that asbestos is physically and chemically inert within landfill, then there are small additional costs from implementation of the Directive. The material would still be carcinogenic and thus require disposal in hazardous landfill and there is likely to be a reduction in the numbers of such sites since there are a large number of co-disposal landfills at present that do not take in any hazardous waste other than asbestos. These are very unlikely to continue operation as hazardous landfills after the Directive is implemented, even if existing sites can be easily divided into a hazardous and a non-hazardous component, because of the additional annual costs of operation for a limited waste intake. This could radically increase the distance travelled by asbestos waste prior to landfill, and hence increase costs. However, analysis of transport distances shows that a large quantity of asbestos fibre already travels long distances for disposal and the differences may be small. The only practical alternative treatment options for asbestos fibre are vitrification or solidification, both of which would render the material suitable for non-hazardous landfill, but neither of which is available at present. These could add another £15- £25/tonne to disposal costs for asbestos fibre.

Asbestos cement is a product of asbestos fibre in a bound matrix. There is a risk of asbestos fibres being released if the product is broken or abraded. The Health and Safety Executive (HSE) recommend that wetting the surface with water is the best practice for minimising health effects from asbestos cement removal. Materials could be coated with resin or emulsion, but the HSE do not feel that this provides any additional health benefits. If wetting is acceptable as treatment, then the removal and transport systems for asbestos cement need little change, and the variation in overall disposal costs is solely dependent on the type of site considered suitable for asbestos cement. A number of landfill sites in the UK take in no special waste other than asbestos cement at present.

The current discussions at European level suggest the following position. Asbestos cement cannot be deposited in an inert site because it may release fibres after landfilling and contains a significant content of asbestos fibre. Co-disposal of asbestos cement with other non-hazardous waste and biodegradable waste should be prevented due to possible degradation of the cement matrix in acidic leachate conditions and the release of asbestos fibres through landfill gas collection systems. If asbestos cement is classified as a hazardous waste in the future, it may be deposited in a separate cell within a non-hazardous landfill under

Article 6 (c)(iii); if it remains as a non-hazardous waste it will still need to be placed in a separate cell within a non-hazardous landfill to avoid interaction with biodegradable wastes.

The disposal of asbestos cement could be more expensive in future if wetting is not acceptable as treatment or if companies currently accepting asbestos cement do not wish to operate a separate cell within a non-hazardous landfill.

Annex II

Table. Hazardous and liquid waste arisings for the UK by Construction and Demolition showing the amount banned hazardous waste properties and the amount of liquid waste

	Total Average Waste (SWaT)	Total to landfill (SWaT)	Total: Banned hazardous properties (SWaT)	Total: Liquid (SWaT)	Non special liquid (UK)	Other factors - landfill	Other factors - haz - properties	Other factors liquid	Amount requiring diversion from landfill: liquid	Additional amount to divert due to banned properties	Additional amount requiring treatment prior to landfill
Total on current HWL	114017	109627	193	68	0	6068	-58	4	72	135	115488
Extra haz. wastes on integrated list	701799	695699	8009	558	0	322564	660	30	588	8668	1009007
Wastes on neither list	261714	250981	4951	873	3446	13677	-38	46	4364	4913	0
Total	1077530	1056307	13153	1499	3446	342309	564	79	5024	13717	1124495

2550te contaminated soil from 010000, 198,400te from 050000 +300 te banned hazards; 2158 from 200000; 23500 from 190000; 50,000 +500 banned properties from 130000 and 9660 from 100000
922 tonnes is liquid with banned hazardous properties, duplication removed
Asbestos fibre waste, 170601, could be considered as already treated by wetting and bagging. This would be 109,434 tonnes treated waste showing no banned or liquid properties
Asbestos cement waste is shown in the third row of the table, and is currently classed as a non-hazardous waste. This is expected to change, but the disposal option is expected to be to non-hazardous landfill without any need for further treatment. Total amount involved is around 200,000 Te
56041 tonnes special waste added, including 79 tonnes liquid, plus 646 tonnes non-special liquid waste, from Scotland and Northern Ireland