

# CHERE



Centre for Health and Environment Research and Expertise

## **A Health and Safety Study of kerbside recycling schemes using boxes and bags**

### **Executive Summary**

CHERE and Cylch have collaborated on a joint project to explore the issues surrounding occupational health within the recycling sector. Working with nine organisations throughout Wales, CHERE looked at collection systems and the tasks involved in these, utilising video footage and observation sheets to provide an evidence base that would be used to make recommendations for improving health and safety. The study focused on the collection of recyclables using boxes and bags; with organisations operating their collection rounds using either a co-mingled or source separated process. A central aim of this research project was to produce a training package that could be used to improve working practices throughout Wales, but also to provide a useful context for improving performance throughout the UK. A successful range of seminars was organised, using visual documentation from the study to demonstrate findings.

### **Aims & Objectives**

To examine the occupational health issues for operatives working on kerbside recycling schemes using bags and boxes

To provide recommendations to assist in developing training to improve H&S

To deliver a series of regional training sessions based on these findings

### **Conclusions**

This study failed to identify any significant risks within kerbside recycling operations using boxes and bags that could not be effectively managed and controlled. The risks identified included twists and strains which were most obvious with certain rear-loading vehicles where operatives found it necessary to adopt un-safe postures in order to load the vehicle. Side-loading or purpose built rear loading vehicles appeared to present significantly less risks.

Plastic boxes appeared, from observations to present a lower risk than bags. The two main problems with bags are the ergonomics of manual handling and the risks associated with sharps injury when objects penetrate a bag. The main risks associated with boxes were the

decanting and sorting of the contents and the occasional carrying of two boxes by operatives. The problems with bags included the ease by which more than one bag in each hand could be carried; the risk of sharps injury from the bags contents and the risk of strains from swinging bags over the head to the back of a vehicle.

Road traffic risks could be effectively managed by using side loading vehicles and waiting on the collection side of the road. Where rear-loading vehicles are used the risk of traffic accidents would potentially increase as operatives frequently stepped back into the path of on-coming traffic.

*A complete description of findings and a list of recommendations are contained in Chapters 10 and 12 respectively*

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## 1. Introduction

1.1 The Centre for Health and Environment Research and Expertise (CHERE) and Cylch (Wales Community Recycling Network) have collaborated on a joint project to explore the issues surrounding health and safety and occupational health within the Welsh recycling sector. This was delivered through undertaking fieldwork in nine local authority areas all over Wales. Wales is split into twenty-two areas, managed from a local government perspective by a single unitary authority. The geography and character of these areas are diverse, with a wide range from the mountainous areas of the north of Wales, to an extensive coastal belt and urban conurbations including the Capital Cardiff, and Wales' second city Swansea. Even though the project focuses directly on Wales, the reports findings will be of interest to any organisation with an interest in recycling and occupational health in the UK or overseas.

1.2 Local authorities in Wales have a statutory responsibility for the collection and disposal of household waste. Traditionally much of the waste produced in Wales was landfilled, with only a very small proportion being diverted to recycling. Stringent Welsh Assembly targets of 25% for 2006/07 and 40% for 2009/10 of all waste to be recycled/composted are now in place, and significant efforts are being made to address these. Each local authority determines how it wishes to deliver both waste collection and recycling, with contracts being awarded in a variety of guises to either local authority companies or the private and community sectors.

1.3 Out of the twenty-two local authority areas, nine organisations took part in the study, with two of these providing an opportunity to explore two separate types of collection methods. These nine organisations were made up of four community sector organisations, four local authorities, and one large private sector organisation. A number of other organisations were unable to take part for various reasons, but the majority were receptive to the scope and objectives of the research project, providing specific reasons for why they were unable to take part. The final response rate to the request to take part was 41%, which provides sufficient data for this type of research.

1.4 The research undertaken provided a unique opportunity to look at specific collection systems and the tasks involved within these for the first time in Wales, using close observation. The findings were almost totally based on what was recorded in the field and later analysed through observation, and it is argued that ample qualitative evidence has been collated that provides a sound basis for making recommendations and highlighting good practice.

1.5 As representative bodies for the community recycling sector in England, Scotland and Wales, CRN UK (Community Recycling Network UK), CRNS (Community Recycling Network Scotland) and Cylch believe they must act as a driving force for improving health and safety. Data highlighted in Section 8.2 indicates that Health and Safety performance within the community kerbside recycling sector is better than that displayed by the waste industry as a whole. The community recycling sector are keen to build on this performance, strive for constant improvements in good practice and wish to demonstrate

best practice in occupational Health and Safety across the board. This report is one of the initiatives the community recycling sector have undertaken to proactively identify any weaknesses within collection systems and focus on recommendations for improvements.

1.6 One of the key aims of this project was to produce a number of recommendations based on our findings that would assist with the training requirements of recycling organisations to improve health and safety. CHERE organised three training seminars delivered across Wales to disseminate good practice and highlight any areas of concern. It has produced a variety of materials to assist Cylch with future training needs and assisted the CRN UK through a “train the trainer” event and a keynote address at its Kerbside Summit in Bournemouth on the 9th of May 2006.

1.7 Funding was received from the Welsh Development Agency’s (WDA) Knowledge Exploitation Fund (KEF), from Cylch, CRN UK and CRNS. The project was managed directly by CHERE, but a steering group consisting of a number of academic institutions and other organisations was set up to assist with the overall direction (Appendix 3).

## **2. Community recycling**

2.1 Waste is higher on the agenda than ever before, it impacts upon every area of people's lives and has the ability to bridge social, environmental and economic barriers. If viewed as a resource, waste provides an enormous economic opportunity that can generate local wealth and employment, opportunities for social enhancement and environmental benefits. The community recycling sector empowers local people to take positive practical action on resource management issues. Reuse, recycling and composting provide a focus for capacity building within local communities and the development of social enterprises.

2.2 Social enterprises centred on waste, retain valuable resources within local communities reducing waste transport miles, train and employ local people and help regenerate deprived areas. Community recycling employees are able to inspire their neighbours and increase participation. Social enterprises create jobs at a local level keeping wealth where it is most effective – at grass roots. The difference with social enterprises is that wealth is not only measured in financial terms but in the positive impact these organisations have on the quality of life of local people and their environment.

2.3 In Wales we landfill approximately 4 million tonnes of waste each year and only recycle around 20% of the rubbish collected by local councils. Every year we produce more rubbish than the year before. If we continue at this rate, it means we will significantly increase the amount of rubbish we produce by the year 2020. As set out in the Wales Waste Strategy – 'Wise About Waste', we need to stop producing and land filling so much waste and thereby squandering finite natural resources.

### **3. The role of Cylch**

3.1 Cylch is an umbrella membership organisation that promotes sustainable resource (waste) management through education and practical action. Cylch promotes community ownership of the waste issue. Waste materials are a valuable resource and if managed effectively can create environmental, social and economic benefits for local people. Cylch Members include waste minimisation, reuse, recycling and composting enterprises throughout Wales. These organisations provide employment and training for a broad cross-section of the local community, including the long-term unemployed and people with special needs. In this model, sustainable resource management goes hand-in-hand with community regeneration.

3.2 Currently, Cylch Membership comprises 74 organisations. The activities of Cylch Members generally fall into one of four broad categories:

- Kerbside Recycling – offer kerbside recycling services to householders, e.g. Wastesavers Recycling
- Furniture Reuse – collect reusable furniture and appliances and redistribute them to people in need, e.g. Conwy Furniture Reclaim
- Community Composting - collection and composting of green garden waste, e.g. Crest Co-operative
- Waste Education – promote waste minimisation, reuse, recycling and composting through education campaigns, e.g. EcoDyfi

3.3 Cylch Members are involved in a whole range of other activities including RePaint schemes, Real Nappy Campaigns, Schools Education, Commercial waste collections, bulky household waste contracts and wood recycling.

## **4. The role of CHERE**

4.1 CHERE is a world-class centre delivering integrated health and environment expertise by combining leading edge research with direct business experience in activities that support sustainable development. It provides impartial expert advice and consultancy services to public, private and voluntary sector bodies. The Centre has been created through a strategic partnership between:

- Professor David Kay of the University of Wales, Aberystwyth's Institute of Geography and Earth Sciences, and
- Professor Ian Matthews of Cardiff University's College of Medicine, Biology, Life and Health Sciences.

4.2 Professors Kay and Matthews have excellent track records of leading-edge research and major consultancy contract work. Their partnership means that CHERE can offer a broad range of environmental and human health expertise, with a special emphasis on the interface between the two disciplines. However CHERE's know-how does not stop here because it also acts as a link to relevant expertise in other research centres and academic institutions across Wales, the UK and beyond. One of CHERE's great strengths is its knowledge of UK, European and world health and environment regulations. CHERE is active in providing advice to law-makers and regulatory authorities on constantly evolving regulatory frameworks. As a result it has strong relationships with a range of government and public bodies operating throughout Wales and the UK.

## 5. The Knowledge Exploitation Programme

5.1 The Knowledge Exploitation Fund (KEF) provides financial assistance to enable Higher and Further Education Institutions in Wales to facilitate the transfer of knowledge to the Small and Medium Enterprise (SME) sector. CHERE has already received funding from this programme to set up its own centre, and is currently in receipt of a second phase of funding to deliver amongst other things this research project. KEF is supported by the Welsh Assembly Government and European Union Structural Funds.

5.2 Since the first phase of the KEF programme began to deliver its outcomes at the end of 2004, over 250 SMEs have received a wide range of support and advice from CHERE. Particular areas of interest have included: food safety, health and safety, water quality, asbestos and waste management. The interaction with SMEs has been delivered through producing briefing materials, individual site visits, telephone consultations and hosting events and seminars. Public exposure highlights in 2005 have included running a seminar as part of the annual conference for SMEs in South Wales organised by the Federation of Small Businesses, and the Cylch AGM at the Centre for Alternative Technology, Machynlleth.

5.3 CHERE has produced a number of briefing materials, including the following:

- Asbestos: the hidden killer
- EC Landfill Directive (1999/31/EC) and its impact on SMEs
- Hazardous waste, the duty of care and the European waste catalogue
- Health in the Work Place
- An introduction to composting as a business option

5.4 CHERE organised and funded a 'Sustaining Well Being in Business Award' in conjunction with ARENA Network as part of their Green Dragon Awards 2004, which was aimed at promoting family-friendly practices, work/life balance, healthier lifestyles, health and safety and responsible environmental practices. During the initial assessment 26 SMEs were visited by one of our key associates and each business explained what it was doing to improve the well being of their staff. As well as listening and encouraging positive action, CHERE also suggested further improvements that could be made, and as part of this programme the briefing sheet: "Health in the Work Place" was produced.

5.5 All businesses, large and small, have a legal responsibility to provide a 'duty of care' to their employees, and health and safety is a particularly high priority for the waste and recycling sectors. CHERE is in an excellent position to provide this focus, which is why it has been commissioned to work with Cylch on this fundamentally important occupational health study.

## 6. Collection of materials

There are a variety of methods for collecting recyclables from the kerbside and these are outlined in the table in Section 9. The three collection methods investigated in this study are described in more detail in Sections 6.1 – 6.3. A comment on the role of the Materials Recycling Facility (MRF) is given in 6.4.

### 6.1 Source Separation

6.1.1 In terms of kerbside recycling, source separation differs from co-mingled collections in that the householder is responsible for separating recyclable materials. Source separation not only ensures that materials are kept clean and separate but also acts as an education tool. If householders are asked to take care and separate their waste, this should reinforce the message that the materials they are separating are valuable resources. At Wastesavers Recycling in Newport for example, householders are provided with 2 kerbside collection boxes:

- Blue box with lid – for paper & textiles which need to be kept dry and clean
- Green box – for cans, plastic and glass

6.1.2 These boxes are collected by kerbside operatives who sort the materials into individual categories onto the purpose built collection vehicle. The process ensures that materials are kept separate and clean from source and minimises the need for further sorting back at the depot. This method has built in quality control enabling the kerbside operative to examine the contents of the collection boxes and inform the householder if any of the materials are unacceptable or if contamination occurs. The collection and sorting system is very visible to the public that again helps reinforce the 'resources not waste' message. As collection schemes expand, householders will be able to separate out further materials such as batteries and kitchen waste that can be collected using the same system.

6.1.3 Both Cylch and CRN UK advocate the source separation method of materials collection as the preferred method.

### 6.1.4 The Cleanstream® Standard

To strengthen its support for the above collection method, Cylch has published and distributed its own quality standard - Cleanstream® - Total Resource Recovery Systems for sustainable resource management in Wales. This document embodies Cylch's aspirations for the future of resource management in Wales. This strategy advocates a strategic partnership approach to waste management in which recyclable materials are source separated at the kerbside to ensure maximum quality. In the Wales Waste Strategy – Wise About Waste, the Welsh Assembly Government recommends (Section 5.40) that Local Authorities follow the principles of the Cleanstream® approach to maximise the collection of clean recyclable and compostable materials from the household waste stream.

## 6.2 Single Stream

In some instances a single waste stream, for example green waste or kitchen waste, may be collected from the household separately. This can be collected in a variety of containers including bags, boxes or wheeled bins. This material is kept segregated on transfer to the collection vehicle and at the depot.

## 6.3 Co-mingled

There are a variety of methods for collecting recyclables co-mingled. Generally the householder is only asked to separate waste from recyclables with all recyclable materials placed in one receptacle that might be a wheelie bin or bag. Sometimes householders are asked to put textiles, card and paper in a separate bag from glass, cans and plastic. The container holding the recyclables is then collected either by a flat bed truck or using an adapted compactor truck. Where compactor trucks are used the public occasionally express concerns that the materials put out may not be recycled at all. At the sorting depot this mixed material is passed over a MRF where the materials are sorted. Some MRFs offer a variety of automated sorting techniques but usually much of the material has to be picked and sorted over a conveyor-belt by hand.

## 6.4 Materials Recycling Facility

6.4.1 The role of MRFs was not explored in this study, however it is appropriate to comment here on the part they play in the recycling of materials. Those 'Cleanstream' methods described in 6.1 and 6.2 involve a significant element of sorting either at the kerbside by recycling operatives, or effective "pre-sorting" by householders who place different materials into different boxes/containers or bags. These materials are kept separate during transportation to the depot in a compartmentalised vehicle and, on arrival, are bulked for reprocessing. At the point of arrival at the depot effectively all, or almost all, of the sorting that needs to be carried out has been undertaken. With 'Cleanstream' systems, it is also at this point that any occupational health impacts for operatives involved in collection **and** sorting cease.

6.4.2 However, in the co-mingled collection of recyclables identified in 6.3, materials are transported co-mingled and when the collection vehicles arrive at the depot, further sorting by operatives must then take place at the MRF. In terms of this study, with co-mingled systems, we have only investigated the occupational health impacts for operatives involved in collection and not included the additional health impacts for operatives involved in sorting at the MRF.

6.4.3 It is beyond the scope of this study to examine the occupational health impacts of operatives working in MRFs, but it is important to highlight the fact that when comparing source separation methods with co-mingled, **ALL** steps of the process should be considered. For source separation methods (6.1 and 6.2) almost all of the sorting, and hence any occupational health impacts take place from when the collection boxes/bags are picked up from the householders front gate/door to when they are deposited into the collection vehicle. As noted above, any impacts then cease or need to be considered as a completely separate process. For co-mingled methods (6.3) further sorting has to take place when the vehicles arrive at the MRF. To correctly compare source separation with

co-mingled methods and identify comparable accident statistics requires further investigation.

## **7. The National Waste Strategy for Wales: Wise About Waste**

7.1 The National Waste Strategy for Wales was published in 2002, and set challenging targets to reduce waste and increase more environmentally friendly options such as recycling. Significant reference to the value of the community sector was made, and relevant extracts are offered below:

**Section 2.21** *'Solutions that meet the needs and aspirations of local communities and which maximise their involvement are likely to provide the most sustainable outcome'*

**Section 3.23** *'The community should have a central role in achieving sustainable waste management....'*

**Section 5.24** *'The community sector can assist in the re-use of furniture, electrical goods, clothes and a range of other items. Local authorities are encouraged to enter into formal arrangements with the community sector to promote the reuse of items'*

**Section 5.39** *'Local authorities are encouraged to enter into partnerships with the community sector and the waste industry to deliver an integrated system that maximises the separate kerbside collection of recyclable and compostable material and the further extraction of materials from residual wastes. This three-way partnership can take maximum advantage of the strengths of each sector. In particular, local authorities are encouraged strongly to involve the community recycling sector, since it:*

- *Has a proven track record for kerbside collection schemes for recyclables*
- *Can make an important contribution towards reuse which counts towards BVPI (Best Value Performance Indicators) for recycling*
- *Can provide support for disadvantaged people (thus maximising the wider social benefits of the strategy)*
- *Is able to energise and engage communities*
- *Is likely to increase motivation of householders to participate in kerbside collection schemes if they perceive that charitable causes are benefiting*
- *Has a proven track record for community composting of green wastes*
- *Has a proven track record of education initiatives'*

**Section 5.40** *'Local authorities are strongly encouraged to follow the principles of the Cleanstream approach advocated by the Wales Community Recycling Network (Cylch). This sets the standard for a 'total resource recovery system' that maximises the collection of clean recyclable and compostable materials from the household waste stream'.*

## 8. Health and Safety and Recycling

### 8.1 The Health and Safety Executive Bomel Report 2004

8.1.1 A report commissioned by the Health and Safety Executive - RR240 Mapping health and safety standards in the UK waste industry (Bomel, 2004) – estimates that around 160,000 workers are employed in the waste industry as a whole, and recent research estimates that around 45,000 extra jobs could potentially be created by 2010. The waste industry reports around 4,000 accidents each year, and the overall accident rate for the waste industry in 2001/02 was around 2,500 per 100,000 workers, which is four times the national average. Handling and sprain injuries resulting from refuse workers handling refuse during collection account for the largest proportion of over 3-day accidents, and being struck by a refuse collection vehicle or a car are the most common *workplace transport* accidents. The number of fatal incidents was over ten times the national average. The accidents predominantly occur during refuse collection, with significant numbers also occurring during loading/ unloading and on-site transfer activities.

8.1.2 The data presented in the Bomel (2004) report concentrates on the *waste* industry as a whole. The accident figures in the BOMEL report are collated from RIDDOR reports. The RIDDOR reporting system does not distinguish between waste and recycling activities as codings are generic. Therefore, recycling is not separated from refuse collection, skips, sewerage, landfill sites etc in these figures which include industrial, commercial and municipal waste collection, disposal and recycling.

### 8.2 CRN UK H&S Survey 2004

8.2.2 In response to the research undertaken by Bomel for the HSE (Bomel 2004) CRN UK carried out its own H&S survey of kerbside recycling operations within the community *recycling* sector. They found that accident rates were lower than those reported by HSE for the *waste* sector, as detailed below:

Statistic	Bomel Report (waste industry)	CRN UK Survey (community sector kerbside recycling)
Overall accident rate	2500 per 100,000 workers	1469 per 100,000 workers
Fatal injury accident rate	10 per 100,000 workers	None over 12 month period
Major injury accident rate	330 per 100,000 workers	105 per 100,000 workers

8.3 Community recycling activities are primarily people based rather than machine based recycling solutions. Cylch and the Welsh Assembly Government, advocate a Cleanstream® approach to achieving national recycling and composting targets. The Cleanstream® approach is based on source separation of recyclable materials at the kerbside. Evidently, this process involves the manual handling and sorting of waste by collection operatives and the collection vehicles tend to spend a greater length of time on the kerbside.

## 9. Project Methodology

9.1 This was a focused study making detailed observations of kerbside recycling collections using boxes and bags. To understand the scope of the project it is helpful to represent in a table the main categories of how recyclables are collected (see below). This shows the stages involved from when the container containing the materials is placed by the householder outside their house, to when this arrives having been transported in the collection vehicle to the depot, where further sorting takes place to a variable degree.

9.2 Householders and the general public involved in the pre-collection stage of the recycling process have not been included in this study. As identified in 6.4 it is recognised that there is a significant difference in the processes involved in source separate systems and co-mingled systems. During source separation, materials are both collected and sorted at the kerbside meaning that minimal (if any) sorting takes place at the depot. With co-mingled systems materials are only collected at the kerbside and sorting takes place at a MRF. It should therefore be noted that in order to make a true comparison of occupational health risks of these two systems one would need to look at the collection and sorting processes of co-mingled systems (i.e. to the end of the MRF). However, examining the occupational health risks at MRFs was beyond the scope of the current study

9.3 The focus of the research was to make detailed observations of the occupational health risks for operatives working on either a **Cleanstream®/source separation collection using boxes** (Type 1), a **co-mingled operation using bags** (Type 2) and a **single stream collection using bags** (Type 4). It has to be noted that while these categories are convenient at this point for classifying the types of collection, during fieldwork the boundaries of these are often blurred. For ease of explanation, the categories investigated are shaded in the table below. The Type 3 operation using wheelie bins was not explored - some local authorities in Wales use wheelie bins to collect green garden waste/ kitchen waste for composting but these decided not to take part in the study.

### The stages involved in the collection and sorting of recyclables

Collection container placed outside front door/gate by householder	Movement of recyclables onto collection vehicle	Arrival of recyclables at final collection depot	Final sorting into categories of separated materials – glass, cans etc
<b>Type 1 – Cleanstream® (source separated) operation using boxes</b>	The operative picks up the box at the kerbside, places it at a convenient place next to/on the vehicle, and physically separates the contents of the box into separate cells in the vehicle	Vehicle arrives at the depot where the recyclables have already been separated	Materials are mechanically moved from the vehicle into separate storage bays/containers, limited (if any) additional sorting is required
<b>Type 2 –Co-</b>	The operative picks up the	Bags are	Manual/mechanical

<b>mingled operation using bags</b>	bag at the kerbside and puts it onto the collection vehicle, no sorting takes place	manually/mechanically moved from the vehicle onto conveyor belts at the MRF	sorting takes place by operatives at the MRF, separating materials into different categories
<b>Type 3 – Co-mingled operation using wheelie bins</b>	Wheelie bins are moved by the operative to the collection vehicle and mechanically emptied onto the vehicle, no sorting takes place	The vehicle is mechanically emptied and its contents are mechanically emptied onto the conveyor belt at the MRF	Manual/mechanical sorting takes place by operatives at the MRF, separating materials into different categories
<b>Type 4 – Single stream operation using bags</b>	The operative picks up the bag at the kerbside and puts it onto the collection vehicle, no sorting takes place	Vehicle arrives at the depot where the recyclables have already been segregated	Materials are manually/mechanically moved from the vehicle into separate bays/containers, limited (if any) additional sorting is required

*Shaded cells highlight those studied as part of this research project*

In order to establish the risk factors associated with the kerbside collection of recyclables an **Observation Sheet** was developed. A blank version of this is presented in Appendix 1. The sheet was based on the HSE manual handling chart and additional fields were added to consider other risk factors. Field studies were undertaken in 9 locations across Wales. Using the observation sheet and digital video camera CHERE Field Officers went to each of the locations and recorded on video the typical working practice of the collection operatives. The Field Officers observations were recorded on the observation sheets shown in Appendix 1. All the recorded data was analysed by a CHERE Chartered Health and Safety Practitioner to identify any significant health or safety risks.

**In order to ensure the anonymity of the operations and operatives, all recorded data and figures are not shown in this report.**

## 10. Findings

10.1 The findings of the CHERE field officers observations are detailed in this part of the report. All video images have been removed as concern was expressed that despite concealment of recognisable features, vehicles or individuals could be recognised by colleagues or others closely involved in operations.

### 10.2 Risk factor – age of operatives

The age of most operatives was between 18-40, only 2 operatives were between 40-55 and of these 1 was a driver. This would suggest that the average age of the operatives was at the height of fitness and physical strength, although this is obviously subjective.

### 10.3 Health issues, disabilities

There were no obvious health issues observed in any of the operatives from either box or bag collections.

### 10.4 Load weight

Random sample loads were weighed at each of the nine collection areas. An average of 10 containers were weighed for each of these and the results are shown below:

Box or Bag?	Lightest	Heaviest	Mean
Box	0.5	12.0	4.9
Bag	0.5	28.0	6.4

A potentially significant risk was demonstrated on video when operatives would frequently collect several bags in each hand. This could result in musculo-skeletal problems. This risk was generally less of a problem with boxes although in some cases two boxes were stacked and carried. This could result in both musculo- skeletal health problem and a trip hazard.

The potential for injury would appear to be greater where rear loading vehicles are used. The operatives have to physically throw the collection bags a minimum height of 2m and often over 3m. Further risks were identified when operatives had to climb into the back of the vehicle to move the bags to the front. This action involved climbing with the risk of a fall from height, slip on the tailgate and possible injury when moving the bags. The side loading vehicle allows safer access and reduces the potential risk. Another side loading vehicle provided a better means of access and an easier and therefore safer loading height.

### 10.5 Load weight – lift/carry frequency

It was difficult to assess with accuracy the number of loads each operative handled during a shift. The results varied from 2.6 loads per 5 minutes to 20 loads per 5 minutes. Total average carrying frequency per operative was calculated at 30.8 seconds. Operatives used different approaches such as decanting recyclables from the householder's box into an empty box which was then carried to the vehicle. Boxes appear to encourage safer working practice. Only one box can realistically be carried at a time whereas from the fieldwork it was noted that several bags were frequently carried in both hands. One

organisation used large bags for collecting 'green' garden waste, the problem with this bag is its size which made carrying difficult.

#### **10.6 Distance load carried from collection point to vehicle**

In most cases the distance travelled between the collection point and the vehicle was about 2 – 3 m. Distances of up to 100 m were occasionally travelled. There were occasions when the vehicle parked a distance away from the point of collection due to access difficulties. In most cases the vehicle was within a 100 m of operatives.

#### **10.7 Observed conditions**

This observation considered the walking conditions and surfaces that operatives would travel along when collecting recyclables. In most case collection was directly from the kerbside and did not present a problem. Some slight inclines were experienced but did not present any significant problems. The video images show typical surfaces that operatives had to contend with, and most of the road and paved areas were in good condition, presenting little in the way of trip hazards. There were a few examples where operatives took 'short-cuts' across grass borders and the grassed areas could increase slightly the risk of slips, particularly if wet.

#### **10.8 Grip on the load**

The grip on the load was to consider how the container or bag was 'lifted'. In general this did not present a significant problem. Handles, rims, boxes were relatively easy to hold unless they had been overfilled. The bags perhaps presented greater problems, as operatives would often carry more than one bag in a hand. Garden waste could also present a problem as this was often not boxed or bagged increasing the possible risk of cuts and scratches from sharp thorns.

#### **10.9 Traffic considerations**

Traffic could present a problem when operatives step back from dropping their load in the rear of a vehicle. This risk was reduced considerably with side-loading vehicles, or purpose built rear loading vehicles. In all the areas surveyed for this project little risk was observed from traffic. The majority of areas where recycling was collected from were semi-rural or quiet housing developments where traffic was relatively low.

The risk of serious injury from road traffic accidents is clearly one of the greatest risks that operatives working in recycling face. Risks could be reduced if the support vehicle was parked on the side of the road where collection is being undertaken, this would avoid operatives criss-crossing the road.

In some of the side-loading vehicles segregation of materials was being undertaken within the rear of the vehicle whilst it was moving. Although the vehicle was moving slowly if the driver should stop suddenly operatives could be injured. This could be avoided by simply avoiding segregation until the vehicle was stationary.

### **10.10 Personal protective equipment**

Personal protective equipment (PPE) should only be provided when all other control methods have been considered and either implemented or ruled inappropriate. In all cases surveyed PPE was clearly in evidence and in most cases was worn by operatives. Amongst the PPE being provided were gloves, high visibility jackets, waterproofs and boots.

There were several occasions when operatives were not wearing gloves while segregating waste with a serious risk of hand trauma. It was also noted that the gloves were not the correct type for handling the recyclables e.g. glass.

## 11. Conclusions

11.1 This study failed to identify any significant risks within kerbside recycling operations using boxes and bags that could not be effectively managed and controlled. The risks identified included twists and strains which were most obvious with certain rear-loading vehicles where operatives found it necessary to adopt un-safe postures in order to load the vehicle. Side-loading or purpose built rear loading vehicles appeared to present significantly less risks.

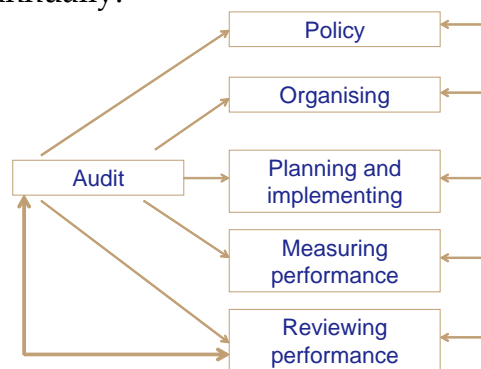
11.2 Plastic boxes appeared, from observations to present a lower risk than bags. The two main problems with bags are the ergonomics of manual handling and the risks associated with sharps injury when objects penetrate a bag. The main risks associated with boxes were the decanting and sorting of the contents and the occasional carrying of two boxes by operatives. The problems with bags included the ease by which more than one bag in each hand could be carried; the risk of sharps injury from the bags contents and the risk of strains from swinging bags over the head to the back of a vehicle.

11.3 Road traffic risks could be effectively managed by using side loading vehicles and waiting on the collection side of the road. Where rear-loading vehicles are used the risk of traffic accidents would potentially increase as operatives frequently stepped back into the path of on-coming traffic.

## 12. Recommendations

### 12.1 Effective health and safety management

This should be used to control the actions of kerbside operatives. Successful health and safety management is based on a publication HSG65 by the Health and Safety Executive, all industries should be using this guidance as the basis for managing their health and safety risks. Starting with a clear commitment to health and safety and detailed policies, there needs to be a clear organisational structure e.g. who is the lead operative, who do they report to?. Planning and implementing safe systems of work and being able to measure the performance of the organisation both proactively and reactively is an essential component of successful safety management. Finally a review process, where there is an opportunity to implement changes. The whole programme should be audited on a regular basis perhaps annually.



### 12.2 Training standards

There is merit in setting standards of training in the recycling industry and in particular the development of a curriculum that should be covered by kerbside operatives. This should include manual handling, ergonomics, the correct use of PPE, road and vehicle safety, and the prevention of slip, trips and falls. CHERE produced a PowerPoint presentation that has been used successfully for training seminars and events, and the slides from this are attached in Appendix 2. However classroom training needs to be complemented and reinforced by on the job training to ensure that learning is being properly applied.

### 12.3 Kerbside operative compliance

Operative compliance may be reduced by failure to consider operative comfort: the wearing of thick or heavy or sweat impermeable high visibility clothing in hot weather for example. This particular problem could be addressed by replacing over garments with light high visibility T-shirts. While there may be some opportunity to standardise PPE across the industry it is clear that the waste type and the way the waste is collected have a significant bearing on the choice of the most appropriate PPE. The selection of PPE must therefore be subject to task based risk assessment; but it should be borne in mind that PPE is the last control measure to be considered. Several observations were made throughout the study, where operatives appeared to use PPE but it was not always the correct type. For example when handling garden waste, with the risk of thorn injuries short gloves were worn with T-shirts, long gauntlet gloves would have been more appropriate. A

further observation would suggest that due to the lack of adequate supervision on the collection round, operatives were not able to check on suitable PPE or systems of work.

Operative compliance with safe systems of work requires on the job supervision. The appointed supervisors must be suitably trained and experienced. They must have clear authority from, and the active support of, more senior managers. If supervisors had been appointed on the collection rounds observed in the present study, this was not immediately evident from the observations made.

#### **12.4 Personal Protective Equipment**

PPE is an important control measure for certain types of injury. The Personal Protective Equipment at Work Regulations 1992 require that PPE must be provided when workers are exposed to a risk to their health or safety, but importantly, requires the employer to consider and implement other more effective means as a first priority. Applying this principle, the design of recycling collection and sorting processes that minimise direct manual contact with sharps should be the first duty of the employer, as far as is reasonably practical, with gloves being provided to deal with unavoidable and exceptional risks. In addition, it is important to consider the possibility that the wearing of PPE may actually increase risk of injury under certain circumstances. Examples are:

- wearing of eye protection may restrict vision and vehicle/traffic movement awareness. This emphasises the importance of keeping goggles clean and replacing them before they become excessively scratched.
- gloves reduce tactile sensitivity and the ability to grip and manipulate loads increasing the risk that a load may be dropped with possible injury to the lower body. This emphasises the importance of good grip holds on collection boxes.

#### **12.5 Recycling industry 'Safety Passport'**

There may be merit in the formation of an effective 'Safety Passport' across the recycling sector in Wales, as it would appear that there is a need to develop a Waste/ Recycling 'Safety Passport' to standardize working practices across the sector. Similar 'Passports' have been developed in the National Health Service in Wales for manual handling and the Institution of Occupational Safety and Health (IOSH) for the construction industry. The advantages of such schemes are their cost effectiveness and their effect on lowering the accident rate. A framework that includes consideration of developing some kind of 'Recycling Industry Safety Passport' could recommend training, safety management, personal protective equipment, vehicle selection and safety. It must be emphasised however that because of the wide variety of collection systems in the recycling industry, anything that is too prescriptive could prove to be counter productive to improving safety.

#### **12.6 Accurate incident/accident reporting**

The need to have accurate incident/accident reporting information is essential for both proactive and reactive safety management. The recycling sector needs to develop a 'sector specific' incident report system that incorporates the general information required under RIDDOR with additional sub-categories to ensure accurate sector information. The form should also incorporate near miss reporting.

### **12.7 Reducing injury by public education.**

Raising public awareness of the potential harm that may result to operatives from inappropriate items or excessive loads being placed for recycling should be part of the sectors risk reduction strategy.

# References

## Websites

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## Publications

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People, Places, Futures - The Wales Spatial Plan

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**The Stationery Office Limited (2002)**

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Wise about Waste - The National Waste Strategy for Wales

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Workplace Transport Safety HSG 136. ISBN 0 7176 0935 9

**HSE Books (1995)**

# Appendix 1

## BLANK OBSERVATION SHEET (USED FOR FIELDWORK)

Venue:

Date:

Type of Collection method

Risk Factors	OBSERVATIONS			
Weather conditions				
Observed average age of operatives	18-25	25-40	40-55	
Observed health issues, disabilities				
Load weight (kg) (5-10 examples)				
Load weight - lift/carry frequency (over a 5 minute period)				
Distance load carried from collection point to vehicle (M) (5-10 examples)				
Observed conditions e.g. flat, steps, up-hill				
Number of bags/boxes lifted by operative at any one time				
Grip on the load (type of hold, e.g. Lift, grip, etc)				
Floor surface (Describe e.g. smooth, slippery, uneven, grass, variable etc.)				
Obstacles that cause problems for operatives				
Traffic considerations: Operatives crossing the road				
Closeness of traffic to operatives				
Obvious traffic concerns observed				
Personal protective equipment:				
Gloves				
Waterproofs				
Is movement restricted				
General observations				

## Appendix 3

### Management and Steering Group

<i>Management Team</i>	
Prof Ian Matthews	CHERE Director Science and project overview
Nigel Hollett	Project manager
Dr Rob Davies	Expert advice Design of research tools
Hannah Watson	Research Assistant
Mal Williams	Cylch Chief Executive Community Recycling overview
Hayley Richards	Cylch Project Manager
Sarah Germain	Cylch Project team
<i>Steering Group</i>	
Andy Rees WAG	
Celine Anouilh Chartered Institution of Wastes Management	
Lisa (Pea) Saunders CRN UK	
Rachel Jowitt WLGA	
Rob Lewis University of Wales Institute Cardiff	
Zoe Lenkiewicz, WWRReC	

## **Appendix 4**

### **CRN UK Health and Safety Survey 2004**

*(text provided by CRN UK)*

The CRN UK as a promoter of community-based sustainable waste management and a national voice for community based recycling and waste reduction have carried out this Health & Safety Survey in order to compare some of the figures and indications reached, with those published in Mapping Health & Safety Standards in the UK Waste Industry HSE Research Report 240. prepared by BOMEL Ltd (Bomel, 2004)

Estimates made in the Health & Safety Standards in the UK Waste Industry HSE Research Report 240 report (Bomel, 2004) suggest that there are around 160,000 workers employed in the UK waste industry, of which around 120,000 are employed in the private sector. Data for workers employed in waste management activities in the public sector are not available. However, extrapolation of accident data indicates that there may be 40,000 to 45,000 waste workers in the public sector. Figures for the community sector are not specifically mentioned in this report.

The CRN UK represents the community sector involved in reduce, re-use and recycling projects. There are estimated to be 850 –1,000 community waste projects operating in the UK, these include community recycling companies, furniture re-use projects, paint redistribution schemes, computer refurbishment projects and community composting groups. Whilst there has been no comprehensive investigation into the total number of workers employed throughout the whole sector, the CRN UK has carried out research into a significant number of organisations operating community-based kerbside schemes to compile figures and in-depth information relating to this specific area of work.

Of particular concern to the CRN UK were the overall accident rates mentioned in the Executive summary of the Mapping Health & Safety Standards in the UK Waste Industry Report (Bomel, 2004). The overall accident rate for the waste industry is reported as being around 4 times that of the national accident rate, the fatal injury accident rate being 10 times higher than the national rate and the major injury rate being more than 3 times higher. The CRN UK was also interested in the types of accident occurring within the community recycling industry and how these compared with those highlighted in the BOMEL report.

CRN UK Health & Safety Survey was sent out to 52 CRN Members who were operating a kerbside scheme as a main or secondary activity, 32 responses were received and used to compile this data (62.5% of CRN UK kerbside orgs.) The survey requested detailed and accurate information relating to staff numbers, all injuries/near misses recorded in accident books over a 12-month period and RIDDOR reported incidents. Health & Safety management data from each organisation is also recorded. All accident book injuries are defined by both injury and activity type. RIDDOR reported incidents provide in-depth information on the injury type, activity, and specific details of the occurrence - where and how, and changes made to systems or procedure as a result of the reported incident.

From these figures the CRN UK has established that the accident rates for the total number of staff working on community kerbside projects are significantly lower to those relating to the general waste industry figures in the HSE Research Report (Bomel, 2004).

HSE Report - Overall accident rate for waste industry 2500 per 100,000 workers

CRN UK Survey - Overall accident rate for kerbside scheme related staff 1469 per 100,000 workers

HSE Report - Fatal injury accident rate 10 per 100,000 workers.

CRN UK Survey - reported no fatal accidents over a 12-month period.

HSE Report - Major injury accident rate 330 per 100,000 workers

CRN UK Survey - Major injury accident rate 105 per 100,000 workers.

## Appendix 5

### List of Acronyms

Name	Acronym
Centre for Health and Environment Research and Expertise	CHERE
Community Recycling Network UK	CRN UK
Health and Safety Executive	HSE
Institution of Occupational Safety and Health	IOSH
Knowledge Exploitation Fund	KEF
Materials Recycling Facility	MRF
Personal Protective Equipment	PPE
Welsh Assembly Government	WAG