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Engineering Doctorate (EngD) in
Environmental Technology

The UK Packaging Regulations and Performance
Measures in Environmental Management Systems

by

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Report Number 1

**‘Total Environmental Information Requirements for a Multinational Computers Company’. Academic Supervisor: Dr. Sue Grimes, Brunel University
Industrial Supervisor: Joy Boyce, Corporate Environmental Affairs Manager, ICL**

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1. Abstract

The Environmental Affairs Department for ICL, based at Putney, has responsibility for the collation and dissemination of environmental information to and from the ICL Group worldwide. The environmental pressures on a multinational business like ICL are growing, the main ones being: the drivers of legislation that are increasing in both number and intensity; the importance of maintaining a healthy corporate image; the competitive environmental marketing advantages available; and the need for sustainable development.

All these business goals are set against a backdrop of limited resources and time. Joy Boyce is the only full time member of staff whose role is solely environmental. Valentine Herman in Brussels is responsible for lobbying in Europe on corporate issues, which includes the environment. The attainment of environmental knowledge and the efficiency with which it is handled within the organisation is the first hurdle to establishing an effective working environmental management system (EMS).

To establish an effective EMS it is fundamental to firstly incorporate it into the existing culture and policy of the organisation, and secondly to manage the information constructively. Much of the legislation demands the production of environmental information and data most of which organisations have never previously had to consider or to record. In addition to this, there is an expected new initiative within the European Community to propose a Directive on the access to environmental information, which highlights the growing importance of environmental information management in the future.

2. Introduction

The research of environmental information management (EIM) is new as a subject in its own right. The main aim of this research is to develop a model of efficient EIM that is incorporated into the organisation's existing policies and systems. This in turn will be the foundation with which to establish and develop a generic EMS within the multifunctional organisation of ICL.

The main areas of work that have already contributed to the research are summarised in section 4 and are as follows:

1. The application of ICL's environmental policy and UK legislation to the disposal of service spares at the ICL Sorbus business, annex 1;
2. The Fujitsu environmental management conference, annex 2;
3. The ICL energy conservation policy, its signatory to the UK Government's 'Making a Corporate Commitment Campaign (MACC)' and energy efficiency survey, annex 3;
4. The UK Government's legislation on batteries and special waste, annex 4;
5. The UK Government's legislation on packaging waste, annex 5;
6. The EU packaging legislation, annex 6;
7. The UK Government's legislation on contaminated land, annex 7;
8. Environmental SWOT analysis: ICL after the sale of its manufacturing subsidiary, annex 8.

All of the areas above involve the management of environmental information within ICL in response to either voluntary Governmental initiatives (MACC) or the legislation which is either in place or is under development. The constant assessment of the details of up and coming legislation is essential to inform the businesses of impending threats. This is an example of information flowing into the business but there is also the flow of information internally, such as the formulation of legislatively defined environmental information systems, such as the packaging databases. The third type of environmental information is that which flows out of the organisation, either to customers or suppliers or to the government.

It is interesting, therefore, to ask how dependent is a company's EMS on its EIM? How is the environmental information managed? How does it flow within the organisation? How is environmental software utilised? Which methods show greatest efficiency?

The Ancient Egyptians built the Pyramids by moving huge stones with mud and water, simple technology but great organisation. The sudden surge of the environmental movement has created not only a flooding of environmental information but also an ever-increasing demand for new information. We have a complex technology but equally great is the need to develop a capacity to organise the information effectively.

One of the modern changes to the organisational structure of businesses like ICL is that they have moved from a monolithic hierarchy to a flat, empowered structure. ICL has become a group of diverse businesses with greater autonomy but as far as the efficiency of its collection and dissemination of environmental information is concerned there is a need for it to be centralised in order for it to become manageable. The UK packaging legislation has brought this to a head in terms of an organisation having to account for its packaging waste flows throughout the whole company and to track its imports and exports and even the size of its partners in terms of tonnage of packaging handled.

The question does also arise as to how other organisations are managing their environmental information? Does it depend strongly on the culture of that organisation? Would a comparative study help to formulate a framework for EIM? How important is effective EIM for their EMS? How have the responsibilities been delegated? How have the corporate strategies/ policies/ targets of the organisation been filtered down through the system? What are the areas of success and failure? Case studies have been discussed to include ICL, the Body Shop, BT, IBM and HP; the aim of this being that the research will not only allow ICL to improve its EIM, but will also provide a framework for organisations on a similar path in the future.

Types of environmental information include awareness documentation/ electronic mail-shots, questionnaires, and software. One of the crucial aspects of environmental information is that it is important for it to fit into the policy and culture of that organisation. Within ICL this involves both its quality culture and initiatives such as the Policy Framework. The Policy Framework is a programme for increasing the overall effectiveness of the ICL group. One of the major parts of this initiative is to ensure that all mandatory Group policies are adhere to, and to put in place projects to improve compliance. One of the mandatory policies is ICL's Environmental Policy.

3. Review

The literature search has involved looking at the different areas of: EMS and organisational culture; information management and technology (IT). The results show that no relevant research has been done in the area of EIM as a subject in its own right, only as aspects of other areas. The literature search has and will involve looking at:

1. Other companies EIM
2. Other companies EMSs and environmental reporting
3. Papers on contaminated land management
4. Contaminated land protocols for risk assessments
5. Environmental marketing/ management
6. ICL documentation
7. UK Government's legislation
8. Information management/ technologies

The review does show some interesting connections in terms of the overlap between EIM and environmental culture. The flow of information is conducted, after all, through people and up and down lines of responsibility. The culture of an organisation plays a large role in how environmental information is managed. There is another overlap between organisational change management and the management of information systems and IT. Most of the general articles on environmental management, whether about environmental performance measurement or environmental accounting, talk about the management of environmental information.

Some of the articles that show relevance to the research are on the methodology for information requirements analysis. The initial stages of the modeling is useful in terms of selection and development of a conceptual basis for an environmental model¹. There is a useful discussion of effectiveness and efficiency in a paper on organisational effectiveness and an approach utilising the stakeholder².

This is particularly adaptable to the initial stages of an environmental information model because it addresses the questions of selection and priority. It is also applicable in terms of social responsibilities and assessment of environmental information priorities in terms of the expectations and demands of the stakeholder. ICL's parent company, Fujitsu (around 90% shareholder), is pushing to implement ISO 14001 throughout all Fujitsu affiliates worldwide. This indirectly puts pressure on ICL to proliferate environmental management throughout its businesses. Environmental performance measurement demands the categorisation of information which is applicable to the creation of an environmental information model and is detailed in a paper by Prof. Peter James³. In addition, there are many documents and brochures on the kinds of environmental software available⁴.

The sheer expense of certifying an EMS within a business is a strong argument in itself for a company developing its own generic environmental management system. In addition, there are the arguments that a certified EMS is only the framework for environmental management and, therefore, does not ensure environmental performance in all areas and secondly does not ensure ease of integration into that business's culture or policies.

The alternative is to develop a generic EMS for ICL which integrates well with its environmental culture and policy and which ensures good environmental performance. The costs of certification could be reduced by allowing certification of a group of sites through sampling by the certification body.

The literature offers arguments for the development of a thorough generic EMS that is tailored to the organisation and that builds on the framework of the certification standard.

4. Report Summary

The ICL Sorbus Disposition (Annex 1)

ICL Sorbus was formed in 1995 by the merger of ICL Customer Service with Sorbus Business Systems. It provides ICL customers with management of all their system services, which is often a complicated portfolio of hardware and software. Joy Boyce and I worked with ICL Sorbus on a project that involved the disposal of large quantities of electronic equipment components and spares. With the rapid changes in the types of equipment and methods of servicing there has been a resultant decrease in the number of spares required. The servicing of equipment uses more modular units rather than individual components. This has led to rapid obsolescence because less individual spares are being kept. The resulting large scale disposition raised concerns over its implications to the 'Duty of Care' within the 1990 Environment Act. It became apparent that environmental risk in the disposal of this size was considerable and that the companies contracted to handle it should be made aware of the environmental law and their (and ICL's) liability. Once the hazardous components of electronic waste were identified, an analysis of the unservicables within the list of spares could be separated out. This information could then be provided to ICL Sorbus in order to manage this particular disposition and any in the future.

The Fujitsu European Environmental Conference (Annex 2)

ICL plc operates as an autonomous company within the Fujitsu federation of companies. Fujitsu was founded in 1935 and is the world's second largest computer company. ICL's relationship with Fujitsu exists at four levels: the ICL/Fujitsu technology agreement; Fujitsu as a supplier to ICL; ICL as a supplier to Fujitsu; Fujitsu's shareholder relationship with ICL. Fujitsu is a supplier of components and other equipment to ICL. With 90.1 per cent of ICL's shares, Fujitsu is the majority shareholder in ICL. Although

that shareholding will decrease when ICL is floated on the London International Stock Exchange, Fujitsu has stated it intends to retain a majority shareholding in ICL.

The Fujitsu Group issued a document called, 'Fujitsu Group Fundamental Environmental Principles'. This outlined that there would be worldwide and regional environmental conferences. The first European Environmental Conference was organised, facilitated and hosted by our department, ICL Corporate Environmental Affairs. Minutes of the conference discussion periods were taken by myself and they are in annex 2.

The second worldwide Fujitsu Environmental Conference is to be held this year. Within the principles laid down Fujitsu has stated that it is committed to 'actively helping conserve the environment and today is renewing its commitment to achieving sustainable development for society'. It also states that, 'the Company is pledged to using its creativity and technology to help achieve industrial growth that respects global ecology'. The Fujitsu Environmental Engineering Centre has responsibility for tracking and monitoring environmental program activities ensuring that the Principles are properly understood. Environmental information, supplied by individual companies is to be disseminated to other companies within the Group by the Environmental Control Department. The Group-wide goals are stated to include:

- The establishment of an EMS consistent with the principles of ISO14001 and/or other EMS standards;
- The identification of opportunities for the recycling of used products and packaging materials and the carrying out of recycling to the greatest possible extent commensurate with the activities and objectives of the Group;

Fujitsu has stated that its domestic manufacturing facilities are to obtain EMS certification by the end of 1997, and similarly, domestic and overseas affiliates by the end of 1998, and major development bases and service bases by the end of 2000.

The ICL Energy Conservation Policy, Annex 3

ICL has signed a declaration of commitment for energy efficiency under the UK Governments 'Making a Corporate Commitment Campaign'. The central feature of the campaign is the signing - by the Chairman or Chief Executive - of a voluntary Declaration of Commitment. The report outlines the principles of MACC and the commitment of ICL as laid out in its Environmental Policy Statement and Targets.

It also outlines the data management for which I am responsible, the progress of ICL sites, and a survey on their energy conservation initiatives. This system was set up for the purposes of raising environmental awareness concerning energy conservation, monitoring progress, and as source information for the production of ICL's first Corporate Environmental Report.

Legislation and ICL, Batteries and Special waste, Annex 4

This report outlines the European and UK legislation covering batteries and accumulators. It outlines:

1. The European Community Directive 91/157/EEC on batteries and accumulators containing specified amounts of particular hazardous substances.
2. The UK transposition of the Directive in GB Statutory Instrument 232 in March 1994.
3. At ICL: battery technologies and requirements of the regulations.
4. An update on the Special Waste Regulations.

Legislation and ICL, Packaging Waste, Annex 5

The first part describes in detail the UK packaging legislation and the progress of our work within ICL to prepare for the implementation of the legislation. This section describes the development of a detailed presentation for delivery to ICL business managers and includes the minutes of the workshop discussion. It also includes the

Briefing Paper to the Management Executive Board of ICL, and questionnaires to be sent out to ICL site facilities and suppliers, in order to assess and coordinate the information requirements. The second report is on worldwide packaging legislation and was written in response to the need for communication to Directors and operations managers. This report will need to be updated and re-circulated on a regular basis.

Legislation and ICL, Contaminated Land, Annex 6

This report details the UK governments draft regulations on contaminated land. The work will go on to examine the opportunities for the research to aid ICL in taking a proactive approach to these regulations. The idea is to develop an EIM for ICL's management of contaminated land. The aim is to formulate an information store of ICL site histories and set up contaminated land phase I software. The software could be utilised to store phase 1 studies on the higher risk sites. Once the model is set up within ICL, it can be utilised when this and other legislation come into force.

Environmental SWOT Analysis of ICL, Annex 7

ICL has recently sold its manufacturing subsidiary and this report is a summary of an environmental SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of ICL as a post manufacturing organisation. It looks at ICL's present relationship with its manufacturing partner and identifies the impacts of the sale. It also looks at the external threats and opportunities arising from the metamorphosis from manufacturing to systems integration and services. A model of ICL's industry position was designed to aid the analysis.

Note:

All the reports in the annexes have been written and compiled by me. Any appendixes that were written by others are noted.

5. Conclusions

Environmental Legislation and Corporate Policy are becoming major drivers for the practical implementation of existing or planned EMS. The environmental management frameworks such as ISO14001 have been examined and found lacking in terms of ensuring environmental performance and sustainable development within businesses⁵. One possible way of enabling the full utilisation of environmental management frameworks is to develop an effective environmental information model that is designed to meet the culture and policies of the particular organisation.

TQEM is an example of how companies have integrated environmental management into their business functions. This has been effective in terms of both the practicality of implementation and the time savings with cultural incorporation. The sudden increase in requirements for environmental information, and the responses to these requirements, need effective management within the organisation. Possible elements of environmental information requirements include:

- Identification
- Categorisation
- Flow
- Technology
- Centralisation

One element of the model will probably be defining the differences between effective and efficient information management in terms of quantitative (database technologies) and qualitative information. The reports so far have mainly been about the first elements of information management, vis à vis the identification of information requirements within the central area of the organisation for initial dissemination to the businesses.

The issue of the packaging legislation is unfolding within ICL and is beginning to show the flow of information within the organisation. The emerging necessity for centralisation is exemplified by the packaging legislation and the Sorbus disposition. The major causes that have come to light so far have firstly been the perception of environmental information by business managers and secondly, the time constraints on those managers. There is a lack of environmental awareness and a perception that the information is not relevant to them, and even when this is not the case the managers do not have the time to interpret the information to determine what is required from them.

The information management framework laid down within ICL for this legislation will hopefully lend itself well to the impending EU Directive on waste electronics at end-of-life and the resulting national legislation, and therefore become a recognisable paradigm. In addition, the application of such a model to the contaminated land issue will hopefully create the opportunity for ICL to be proactive in the event of more longer term projects. As an integral part of ICL's Environmental Management Programme it should improve efficiency and performance.

6. Future Work

Future projects at ICL will include:

1. Fujitsu: To further environmental management connections with ICL's parent company and to provide an insight into how organisational hierarchy and Japanese culture effects the dissemination and integration of environmental information.
2. Energy Conservation: To further fulfill corporate information needs and look at the possible opportunities for incorporation of financial issues into the analysis.
3. Packaging Legislation: To continue to track the flow of environmental information and the demands both internally and externally. To possibly carry out an economic LCA on the implementation of the packaging legislation within ICL. To perform an analysis on the results of internal questionnaires. To assist in any joint projects with waste management companies or packaging suppliers on a corporate scale.
4. Contaminated Land: To develop a protocol for risk assessment of ICL sites and to utilise software available for phase I studies. To examine parallels with this information management and that of the packaging legislation.
5. Environmental Awareness: To continue accumulation of centralised environmental information and to set up systems for awareness raising within ICL. To look at the effects of these processes and the flows that ensue.
6. ICER and Policy Framework: To become more involved with both the internal ICL culture in terms of the Policy Framework initiative, and the relations with the electronics industry as a whole through ICER (Industry Council for Electronic Recycling).

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Report Number 1

Annex 1

Annex 1:

The ICL Sorbus Disposition

1. Background

With the changes in the types of equipment and methods of servicing there has been a resultant decrease in the number of spares required. The servicing equipment takes the form of far more modular units rather than individual components. Much less individual spares are kept and obsolescence has become faster. This has led to large scale disposition. Monolithic warehouses have developed as it is easier to have modules in manufacturing sites. This is because there is less down time created for the customer and greater competition / cost efficiency. The resultant multimillion pound disposition of spares led to concerns over its implications to the Duty of Care within the 1990 Environment Act. It became apparent that environmental risk in the disposal of this size was considerable and that the companies handling it should be made aware of the environmental law and their personal liability. The passage of events that followed involved a lot of awareness raising in branches of the Environment Agency and within ICL.

2. Points for Concern

According to the definition of waste set out in the Environment Act 1990, the spares disposal from Sorbus is defined as waste. The sheer volume of the disposal meant that it would not go unnoticed. It was thought to be necessary to document how much would be considered true waste and how much could be sold on through brokers. It was stressed that all should be handled as waste under the definition of the law. Under the Duty of Care, documentation of the type of waste was needed. An environmental questionnaire was sent and completed by the sub-contractors for disposal (Appendix 1, written by Joy Boyce). The responses to the questionnaire showed a lack of clarity with regard to the

companies involved and raised concerns over their awareness of environmental responsibilities in law. A particular concern was over CRTs with regard to ICL's publicity over their environmental processes for such disposal as opposed to landfill.

There was clearly a lot at stake including the possibilities of future revenue earning services in the environmental recycling/ disposal of customers' own IT. In addition, ICL is the only electronics group in the world to have BS7750, ISO14001 and EMAS and was the first company anywhere to gain all three environmental standards. It was therefore crucial that these and other environmental achievements should not be endangered. It was also seen as a possible opening for beneficial publicity for both the ICL group and ICL Sorbus.

3. Information Requests

The information needed from the spares disposal contract was requested. This included the following:

1. Information on and copies of licences held by the prime contractor and by their subcontractors. These were to include licences for registered waste carriers, waste manager, or an exempt for waste management licensing; licence for a waste collection authority, authorised transport purposes.
2. Information on the type of product which will be disposed of e.g. numbers of CRTs, numbers of batteries, numbers of magnets etc.
3. Information on the routes taken for all wastes arising from the ICL Sorbus disposal: e.g. waste carrier, waste manager, waste collection, any further brokerage of waste, any further brokerage of the product and the relevant and associated recycling/ reprocessing or recovery operations.

4. Information on any scrap metal dealers involved in the disposal of waste from the contract as they are required to be licensed under the duty of care.
5. Information on the licensed landfill sites used by the main contractor or any of their sub-contractors.

It was pointed out that failure to observe the Duty of Care under the 1990 Environment Act and the 1991 Regulations is a criminal offence. Information was sent regarding the Waste Management Duty of Care Code of Practice and Section 34 (10) of the 1990 Act.

4. Meeting with Subcontractor

A meeting was arranged between Joy Boyce, Corporate Environmental Affairs Manager, and the subcontractor, the outcome of which was an agreement to document the system, accounting for all movements of spares and the methods of disposition. It was decided that the sub-contractor should provide a 100% audit trail of all parts including licences. A copy of the contract was sent and clearly stated that the title to the goods remained in ICL Sorbus until the sub-contractor disposed of them.

It was considered urgent that the parts with hazardous content and disposal methods be identified. CRT disposal was discussed with Mayer Cohen Industries who offered support and requested information on quantities and types. Copies of the original disks with quantities and descriptions of disposition parts were provided by the Logistics Warehouse Manager at Sorbus to enable the above processes to begin, as described in section 6.

5. Environmental Process

An environmental process was agreed upon that involved the vital components of the disposition process. These main elements were listed and detailed as logistics, records and audit trail.

All items for disposal by CRB were to be transported by ICL Sorbus (via ICL Sorbus' logistics contractor) to the sub-contractors warehouse. In the contract the title only changed when the sub-contractor disposed or sold the goods, until then all the items were the property of ICL Sorbus. The security of the items was the responsibility of the subcontractor whilst in their warehouse and were insured by ICL Sorbus. All the items deemed by the subcontractor to be unfit for resale as whole products and were passed to a disassembler were classified as ICL Sorbus waste.

ICL Sorbus were to maintain records of all items for disposition including product type, quantity, model and part numbers. In addition, ICL Sorbus were to maintain records of all items on each pallet, and each delivery load which is transported by ICL Sorbus to the sub-contractor. ICL Corporate Environmental Affairs were to work with ICL Sorbus to maintain records of; (1) all hazardous and difficult (in terms of safe disposal) materials contained within the items transported to the sub-contractor and (2) all suitable disposal methods for the materials referred to in (1).

The sub-contractor was to maintain records of all disposal routes, the amount and type of items disposed of, and the date of disposal. The sub-contractor was also responsible for ensuring that all necessary licences and official records are held, e.g. waste carrier, waste management, waste disposal, waste broker licences, Duty of Care Waste Transfer Notes.

The sub-contractor was to be held responsible for documenting a complete audit trail from their warehouse through to the landfill site or other disposal destination (incinerator) of all wastes. The sub-contractor, by working with Corporate Environmental Affairs, was

to maintain a list of all waste disposal partners involved in any part of the ICL Sorbus Spares Disposition Project.

The list was to include information on; (1) name of the organisation and address of their registered office, (2) name and address of the holdings company of the organisation if applicable, (3) where the disassembly/ disposition was carried out, (4) which materials/ products/ items were sent to them, what processes they used, details of any licences they hold.

ICL Corporate Environmental Affairs, working with the sub-contractor and ICL Sorbus, were to maintain a database of the types and quantities of materials which ICL considers an environmental risk and for which ICL has identified and used, through its own operations, environmentally preferential disposal. The database will also record the amount/ quantity of the materials/ parts contained in this disposition project and the methods and routes used to dispose of them. Where appropriate this was to be cross referenced with other parts of the environmental management system.

ICL Sorbus, working with the sub-contractor and ICL Corporate Environmental Affairs were to monitor and record information on all packaging sent to CRB. This was in anticipation of the imminent imposition of legislation concerning the recovery, recording and recycling of all types of packaging.

6. Hazardous Materials Identification

The identification of hazardous materials in the ICL Sorbus disposition became my responsibility and involved working on copies of the original disks of the quantities and descriptions of disposition parts provided by the Logistics Warehouse Manager at Sorbus. Once classifications of products containing environmentally hazardous substances had been identified the sorting of the items on the disposition lists could begin. These items were defined as follows:

<i>Parts</i>	<i>Contents</i>
Batteries	Li, Ni, Cd, Hg
Capacitors	Pb Pre 1972 contain PCB
Contact Breakers	Hg
Connectors	Be
VDUs, screens, display units, CRTs, monitors, Crystal, LCD	Wide range of elements. Heavy metals inc. Zn, Ba, Pb. Also others inc. trace Ar
Relays	Hg
Diodes, LED	Classified as Special Waste
PCB	Heavy metals inc. Cd, Pb, Ba, Sr Brominated flame retardants
Magnets	Cd or Co

Key

Li	Lithium	Pb	Lead
Ni	Nickel	Be	Beryllium
Cd	Cadmium	Ba	Barium
Hg	Mercury	Ar	Arsenic
Zn	Zinc	Sr	Strontium
PCB	Polychlorinated Biphenyls	Co	Cobalt

The spreadsheets of the units, classified as containing hazardous materials, from the ICL Sorbus Disposition disks are attached (Appendix 2, written by ICL Sorbus, sorted by myself).

Annex 1

Appendix 1

Environmental Questionnaire sent to Sub-Contractor (Section 2)

By Joy Boyce

ref; jgb/sorbus/quest.sprs

ENVIRONMENTAL QUESTIONNAIRE

TENDER FOR SPARES DISPOSAL

GENERAL

- Q1: Does your organisation have an environmental policy?
If so, could we please have a copy?
- Q2: What environmental processes do you have in place for the re-use, refurbish and recycling activities for parts and components, and/or what processes are you planning to institute to deal with our business?
- Q3: Who are your major partners for disassembly and specialist recovery of materials?
- Q4: Do you require environmental information from your suppliers/partners similar to the level of detail we are requiring of you?
- Q5: Do you have environmental policy statements from your suppliers/partners?
- Q6: Does your company maintain a register of relevant legislative and regulatory requirements which affect your operations?
- Q7: Has your company, or any of your partners ever been convicted of, or paid any fines for, violations under any environmental regulations?
- Q8: Can you provide an environmental audit for a typical lorry load of spares and components from our project? What are the processes by which you would do this?

RECYCLING

- Q1: When you have refurbished/repared components/systems, who then carries out your separation of residue materials?
- Q2: Into which fractions do you (or your partner) commonly separate? e.g., precious metals, ferrous metals, non-ferrous metals, aluminium, etc..
- Q3: How do you deal with cathode ray tubes?
- Q4: When you have separated and recovered all useful integrated circuits and surface mounted components, how do you deal with the residue of a printed circuit board?
- Q5: Do you send plastics for recycling to a specialist plastics recycler?

ENVIRONMENTAL QUESTIONNAIRE

GENERAL

- Q1. CRB does not have a written policy concerning environmental issues. However, we are aware of the requirement to act in a professional and responsible manner. Our main sub-contractor, CCC, has accreditation to BSEN ISO 9002
- Q2. Re-use, refurbishment and recycling activities are all carried out for us by CCC and therefore subject to ISO 9002 procedures.
- Q3. Our proposed sub-contactors for disposal purposes are:
- Computer Salvage Specialists of Arnhem Road, Newbury,
Berks RG14 5RU
- and
- ARS, 19-25 Jarman Way, Off Orchard Road, Royston, Herts
SG8 5HW
- Q4. NO
- Q5. NO
- Q6. NO
- Q7. NO
- Q8. NO. Our proposal is that ICL Sorbus audit the first re-processing activity against the re-marketing contract.

RECYCLING

- Q1. Computer Salvage Specialists
- Q2. Metals, plastics, glass and paper products
- Q3. Handled by our appointed re-cycler
- Q4. Handled by our appointed re-cycler
- Q5. Yes, if sufficient volumes

WASTE ARISING

- Q1. NO
- Q2. Handled by our appointed waste disposer
- Q3. We will audit with ICL Sorbus as necessary
- Q4. YES
- Q5. Paper re-cycling specialist if sufficient volumes
- Q6. NO

Annex 1

Appendix 2

The Spreadsheets of the Units, Classified as Containing Hazardous Materials, from the ICL Sorbus Disposition Discs (Section 6)

7014821003	BATT 3 6V 450 MAH NICKEL	DATA CHECK	017-014821-003	23	23	0	0	£138.69
0007981990	BATTERI LIT 7.2V 2AH 2ER	57321030		12	12	0	0	£161.16
0007927318	BATTERI TILL DIGITALPENNA	50814/197		24	24	0	0	£38.40
00800949437	BATTERY 3 6V RECHARGE PCB MTG	3/1000KO/DB8283		3	0	3	0	£8.18
0007723903	BATTERY 5 0V 0.24A PACK	FDC	9570-0002	11	10	1	1	£176.11
7004120001	BATTERY 5 0V 0.24A PACK	DATA CHECKE	002-004120-001	1	0	1	0	£24.70
4901844901	BATTERY 12 0V 5A	DRS 20	CFRV5-L	1	0	1	0	£25.94
7000000035	BATTERY 12V 5 0A ABS (WHITE)	DATA CHECKE	ILA 0213A	20	8	12	0	£848.00
7000000036	BATTERY 12V 5 0A MONOBLOC (BLACK)	DATA CHECKE	9809-7235	38	20	16	0	£879.12
7000000037	BATTERY 2 5A 12V ABS WHITE	DATA CHECKE	ILA 0214 A	11	1	10	0	£378.73
0007939010	BATTERY 3 0V	D3P CLUSTE	TL-5242/W	4	15	4	0	£53.40
0007939010	BATTERY 3 6V 1.9Ah LI	DATA CHECKE	IBN0207 A	4	0	4	0	£28.28
0007756712	BATTERY 4 85 2V 450MAH	DATA CHECKE	049-014539-069	4	4	0	0	£38.24
7014538069	BATTERY 8BI MEMORY RECHARGEABLE	DATA CHECKE	CA31005-0025	24	24	0	0	£12.16
0007766180	BATTERY BOX FOR MODEL 303	DATA CHECKE	95207303	45	45	0	0	£48.00
0007943157	BATTERY HOLDER QC339	DATA CHECKE	50814/324	20	20	0	0	£82.80
0007761904	BATTERY LEAD ACID	DATA CHECKE	D98L-1020-C838	1	0	1	0	£454.00
0007763841	BATTERY LITHIUM	DATA CHECKE	C14L-5900-C611	1	0	1	0	£4.99
0007922607	BATTERY LITHIUM 3V 4570	DATA CHECKE	50814/015	16	16	0	0	£29.12
7011405002	BATTERY NICAD 3 6V	DATA CHECKE	50814/308	14	14	0	0	£466.20
7402912300	BATTERY PACK 3 6V 1.1AH TOC CLOCK	DATA CHECKE	017-011405-002	10	0	10	0	£35.40
7000183004	BATTERY UNIT INVERTOR TYPE 2	DATA CHECKE	4029123-00	8	8	0	0	£35.44
7000288004	BATTERY UNIT INVERTOR TYPE 3	DATA CHECKE	7000183004	10	4	6	0	£1,817.40
		DATA CHECKE	7000288004	8	7	1	1	£1,068.98

0007763551	BATTERY	LPS PP250	B250-3950-V015A	3	3	0	0	£85.92
0007813834	BATTERY 25 0A STANDBY	MARS DEFAU	7813834	1	0	1	0	£388.88
0007766862	BATTERY (10GP2000AFK) 6V NICAD 4000MAH	MARS DEFAU	80 45303 011	1	0	1	0	£39.44
0007768325	BATTERY (GP/INIMH) 6V 4800/5000MAH	MARS DEFAU	80 47802 001	2	0	2	0	£148.48
0007757061	BATTERY 3V DISC CR2430	OFFPTR ML1	LP-45478	2	0	2	0	£3.52
0007788574	BATTERY 6V LITHIUM FOR M300-05 CONTROLLER	ORSS500	7788574	65	44	21	0	£364.00
0007787275	BATTERY 6V METAL NIMH 4800 MAH	MARS DEFAU	80 45303 021	1	0	1	0	£48.87
0007767813	BATTERY ASSY	MARS DEFAU	44LK48TFX03	21	21	0	0	£940.17
0007821214	BATTERY ASSY AOC (SAFT)	NORTELE	7821214	11	0	11	0	£110.88
000772130	BATTERY AST BRAVO LC SERIES	MARS DEFAU	AST175000-013	1	0	1	0	£5.00
0007813850	BATTERY CHARGE/OVER CONTROLLER UNIT	MARS DEFAU	85USU00028AAA	2	0	2	0	£168.10
0007771285	BATTERY FOR MAIN PCB 4501 OMRON	MARS DEFAU	0091436-2	15	15	0	0	£149.10
0007771271	BATTERY FOR RAM BOARD	MARS DEFAU	1071255-0	1	1	0	0	£15.00
0007773702	BATTERY LI-ION	MARS DEFAU	23 20004 004	44	44	0	0	£2,200.00
0007820668	BATTERY NI CAD	NORTELE	MT706534	2	1	1	0	£16.38
0129948001	BATTERY NICAD POWER SMART	MARS DEFAU	129948-001	2	1	1	0	£130.00
0007766855	BOARD BATTERY	MARS DEFAU	55 45302 001	1	0	1	0	£2.88

0007949576	BATTERY	PCNDNOKIAC	3/N-270AA (1150)	18	7	9	0	£97.28
0007766370	BATTERY 3 6V	PS BASEBOX	A4700774	4	0	4	0	£8.06
0007763711	BATTERY 4 6V 1200MAH VE	PCNB NOTEB	7763711	10	3	7	0	£30.00
0007761696	BATTERY 6V 10AH LEAD ACID FOR 500VA PSU	POS RPS	903-LC-00010-0008	28	28	0	0	£485.80
0007761650	BATTERY 6V 10AH	PCT UPSM15	7761650	2	0	2	0	£27.60
0007707067	BATTERY 8557-045	PS SOMER	02M33F8354	19	19	0	0	£110.20
4901714501	BATTERY AAA ALK	POS TERMIN	PL090117	28	28	0	0	£10.38
00PL090117	BATTERY CHARGER EXTERNAL #50 SERIES	PS SPRING9	PL090139	2	2	0	0	£53.38
00PL090139	BATTERY CHARGER EXTERNAL # SERIES	PS SPRING9	299-00-34994-0200	22	21	1	0	£142.44
0007763374	BATTERY FOR 520VA RPS	POS RPS	06956680	77	77	0	0	£381.48
0007755915	BATTERY G20 RTC 100MAH 3 6V	POS MOST 3	DL223A-VFL	14	14	0	0	£143.22
0080070294	BATTERY LITHIUM 6V WITH CFORM	PWS BASEUN	1BP522ZIC11	6	0	6	0	£330.42
0007765495	BATTERY NICAD 1700MAH	PS NB396L8	7765532	2	0	2	0	£3.24
0007765532	BATTERY STANDBY 68MAH	PS NB396L8	7765532	2	0	2	0	£3.24

0007769473	BATTERY 1 3P 20HR	SPECRETAIL	7769473	13	0	13	0	£301.60
0007769409	BATTERY BACK-UP 26V	SPECRETAIL	DUNTK2900RCZ2	1	0	1	0	£62.06
0090071489	BATTERY FOR S25 CP/DUAL BATTERY BACKUP	S25 CP/DUA	80071489	5	2	3	0	£118.25
0005152486	BATTERY HOUSING ASSY	S25/2 PROC	5152486	1	0	1	0	£136.15
000771397	BATTERY YUASA NP-8-6 6V 8 0 AMR	SPECRETAIL	008-1020116	28	26	0	0	£650.00

9014063	CS600027	3	3	0	0	£0.81
0009014064	SCAP0013 CAP MOD JL19V	86	86	0	0	£14.06
0007949307	SCAP0016 CAPACITOR 1NF 250V	1297	1297	0	0	£218.80
7007011004	50014104	53	53	0	0	£216.24
0007752300	CAPTR	9	9	0	0	£0.81
4902588715	CAPTR 0110V 36-43 UFD 110V	9	9	0	0	£0.63
0080051668	CAPTR 000000 0001UF 0050V CER	3	3	0	0	£16.51
4902595203	CAPTR 000000 0001UF 0100V 10%	16	16	0	0	£0.16
0007752796	CAPTR 000000 0010UF 0050V 20%	34	34	0	0	£0.99
0080053465	CAPTR 000000 0010UF 0063V	33	33	0	0	£0.14
0007731419	CAPTR 000000 0010UF 0100V 10%	2	2	0	0	£0.71
0007729884	CAPTR 000000 0010UF 0300V	41	41	0	0	£0.41
0080009506	CAPTR 000000 0010UF 0350V MICA	2	2	0	0	£0.30
0005073389	CAPTR 000000 0010UF 0500V CER	6	6	0	0	£2.26
0007755380	CAPTR 000000 0010UF 0750V	2	2	0	0	£1.92
0080019439	CAPTR 000000 0010UF 1500V CS248	1	1	0	0	£0.16
0080051096	CAPTR 000000 0010UF 500VDC 10% CERAMIC RADIAL	3	3	0	0	£4.95
4901978102	CAPTR 000000 0013UF 0100V	21	21	0	0	£2.10
0007752373	CAPTR 000000 0015UF 0050V	16	16	0	0	£0.48
0080051240	CAPTR 000000 0015UF 0060V	33	33	0	0	£0.99
0007752373	CAPTR 000000 0015UF 0100V CER	76	76	0	0	£6.08
0080019412	CAPTR 000000 0018MF 0050V ~5%	19	19	0	0	£0.38
0080051671	CAPTR 000000 0022UF	244	244	0	0	£19.52
4901808116	CAPTR 000000 0022UF 0050V CS190	14	14	0	0	£0.70
0005108085	CAPTR 000000 0022UF 0100V CER	33	33	0	0	£2.31
0007752372	CAPTR 000000 0022UF 0100V CER	13	13	0	0	£0.39
0007731430	CAPTR 000000 0022UF 0200V MICA	1	1	0	0	£0.14
0080003005	CAPTR 000000 0022UF 250VAC 20% MET PAPER RAD	25	25	0	0	£2.25
0080050485	CAPTR 000000 0033UF 0050V CS190	16	16	0	0	£2.06
0005108087	CAPTR 000000 0033UF 0400V CS288	1	1	0	0	£3.22
0080009006	CAPTR 000000 0033UF 0500V	1113	1113	0	0	£33.39
0007729981	CAPTR 000000 0033UF 10% 100V D/C PLASTIC FILM	5	5	0	0	£0.85
0080051790	CAPTR 000000 0033UF 1500V	1	1	0	0	£0.03
0080019575	CAPTR 000000 0033UF 50VDC 10% CERAMIC XR7 AXL	8	8	0	0	£0.48
0080051024	CAPTR 000000 0047UF	66	66	0	0	£0.66
4901808120	CAPTR 000000 0047UF 0050V CER	12	12	0	0	£0.72
0026350891	CAPTR 000000 0047UF 0050V CS190	14	14	0	0	£0.70
0005110962	CAPTR 000000 0047UF 0100V	1	1	0	0	£0.06
0007752380	CAPTR 000000 0047UF 0100V CERAMIC 10% XR7 AXL	26	26	0	0	£4.42
4902568706	CAPTR 000000 0047UF 0100V CS279	14	14	0	0	£1.12
0080009702	CAPTR 000000 0047UF 0160V PETP	7	7	0	0	£0.42
0005037549	CAPTR 000000 0068UF 0050V CS190	46	46	0	0	£1.38
0005110963	CAPTR 000000 0100UF 0050V 10%	2	2	0	0	£0.38
0080051235	CAPTR 000000 0100UF 0050V 05% CER AXIAL CS492	61	61	0	0	£1.83
0080051690	CAPTR 000000 0100UF 0050V CER 0 1UF 50V CER	159	159	0	0	£19.08
7007788410	CAPTR 000000 0100UF 0050V CS190	10	10	0	0	£7.70
0005110964	CAPTR 000000 0100UF 0200V MYLAR	11	11	0	0	£8.36
0005029184	CAPTR 000000 0100UF 0200V FILM	52	52	0	0	£0.20
0007709318	CAPTR 000000 0100UF 2000V CER	4	4	0	0	£0.52
0080009138	CAPTR 000000 0100UF 50V	5	5	0	0	£1.58
0007757495	CAPTR 000000 0100UF SM 0050V 1206 X7R CS495	173	173	0	0	£98.88
0080051763	CAPTR 000000 0120UF 1KV 20% POLYPROPYLENE	13	13	0	0	£4.55
0080054162	CAPTR 000000 0150UF 0400V POLY	1	1	0	0	£1.90
0007731422	CAPTR 000000 0200UF 0050V CER	10	10	0	0	£0.70
0007722190	CAPTR 000000 0220UF 0630V POLY	6	6	0	0	£1.76
0080048669	CAPTR 000000 0220UF 1000V	35	35	0	0	£4.62
0007731423	CAPTR 000000 0220UF 0630V POLY	233	233	0	0	£1.05
0007750239	CAPTR 000000 0330UF 0016V CER DISC	1098	1098	0	0	£4.66
0005110247	CAPTR 000000 0330UF 0040V CS3	6	6	0	0	£21.92
0005108203	CAPTR 000000 0330UF 0040V CS6	30	30	0	0	£0.56
0005108236	CAPTR 000000 0330UF 0050V CS237	30	30	0	0	£4.80
4901808132	CAPTR 000000 0470UF 0050V CS237	4	4	0	0	£1.50
0005108240	CAPTR 000000 0470UF 0050V	41	41	0	0	£0.84
0007723911	CAPTR 000000 0470UF 1000V CS295	6	6	0	0	£1.23
0080019456	CAPTR 000000 0470UF 630VDC 10% MET PETP RADIAL	7	7	0	0	£0.48
0080051027	CAPTR 000000 0470UF 630VDC 10% MET PETP RADIAL	7	7	0	0	£0.14
0080053313	CAPTR 000000 0470UF SM 0050V 1206 X7R CS495	7	7	0	0	£0.14

0005021546	CAPTR 000100 0000UF 0020V CS174	5021546	2	2	0	£7.20
0005050467	CAPTR 000100 0000UF 0025V 222 030 3R101	D3P MOD A4	10	10	0	£0.70
7010395002	CAPTR 000100 0000UF 0025V ELEC 100UFD 25V ALEL	DATA CHECK	162	162	0	£101.68
0007706131	CAPTR 000100 0000UF 0025V ELECT	513D10 7M0258D4	186	186	0	£18.80
0000009439	CAPTR 000100 0000UF 0025V ELECT	EBK100 25	2	2	0	£0.06
7011333008	CAPTR 000100 0000UF 0035V 1004F 35V ALEL	7500	6	6	0	£3.44
0000004840	CAPTR 000100 0000UF 0050V	D20V VDUK/	22	22	0	£136.18
4901978101	CAPTR 000110 0000PF 0300V	DRS 20	25	25	0	£15.50
0007760346	CAPTR 000120 0000PF 0100V 02% MICA DIPPED RAD	D40P L7050	3	3	0	£1.08
0007739229	CAPTR 000150 0000PF	D88P CONT	24	24	0	£1.44
0007752801	CAPTR 000150 0000PF 0063V	D88P CONT	34	34	0	£1.70
0005110919	CAPTR 000150 0000PF 0100V CS180	2900	28	28	0	£2.80
0010878508	CAPTR 000150 0000PF 0125V PO	2900	21	21	0	£1.26
0007729571	CAPTR 000150 0000PF 0500V	1500	23	23	0	£69.69
0028360633	CAPTR 000150 0000UF 0008V TANT	2900	30	30	0	£30.90
0007727861	CAPTR 000150 0000UF 0020V TANT	EDS 80 FIR	19	19	0	£218.12
0007731427	CAPTR 000180 0000PF 0063V POLY	D88P CONT	2	2	0	£0.20
0007732356	CAPTR 000180 0000PF 0100V	D88P 8801S	15	15	0	£1.20
0007710427	CAPTR 000200 0000UF 0400V ELECT	7710427	14	14	0	£66.92
0007750235	CAPTR 000220 0000PF 0018V CER DISC	7750235	10	10	0	£0.50
000051264	CAPTR 000220 0000PF 0050V +-05% CERAMIC AXIAL	80051264	25	25	0	£0.75
000053685	CAPTR 000220 0000UF 0010V ELECT ALFOIL VERTMTG	UBE1A221MPT	541	541	0	£692.48
4901425842	CAPTR 000220 0000UF 0015V ELECT	1500	16	16	0	£45.60
000050310	CAPTR 000220 0000UF 0018V	D3P MOD A	64	64	0	£3.20
0007731417	CAPTR 000220 0000UF 0018V ELEC	D88P CONT	46	46	0	£4.14
0000048441	CAPTR 000220 0000UF 0025V	D20V VDUK/	816	816	0	£40.80
0000051026	CAPTR 000220 0000UF 385VDC -10%+30% ELECT	D2V MOD 30	1	1	0	£2.09
0007739815	CAPTR 000230 0000UF 0110V	FDS 160	2	2	0	£42.40
4902595201	CAPTR 000330 0000PF 0050V +-10% CER	D20P M25CO	15	15	0	£1.35
000051330	CAPTR 000330 0000PF 0050V CS492 CER AXIAL	D20F AP3	66	66	0	£1.98
0007752258	CAPTR 000330 0000PF 0100V CER	D88P CONT	1	1	0	£0.84
000019430	CAPTR 000330 0000PF 0100V CS278	2900	20	20	0	£0.60
000019451	CAPTR 000330 0000PF 0100V CS293	2900	16	16	0	£1.12
000051523	CAPTR 000330 0000PF SM 0050V 1208 NPO CS493	D3P MOD A5	7	7	0	£0.21
7002303733	CAPTR 000330 0000UF 0025V 300UFD 25V MINIMUM	DATA CHECK	10	10	0	£4.30
0007729945	CAPTR 000390 0000PF 0100V	1500	2	2	0	£1.54
0007750236	CAPTR 000470 0000PF 0018V CER DISC	D20V VDUK/	17	17	0	£1.19
000051351	CAPTR 000470 0000PF 0060V CS492	D3P MOD A4	61	61	0	£1.83
0007780349	CAPTR 000470 0000PF 0100V 05% MICA DIPPED RAD	D40P L7050	3	3	0	£0.93
000009735	CAPTR 000470 0000PF 0350V MICA	80009735	68	68	0	£0.68
000070623	CAPTR 000470 0000UF 0018V +-20% ELECTROLYTIC	80070623	11	11	0	£4.51
0007723914	CAPTR 000470 0000UF 0018V ELECT	FDC	7	7	0	£11.48
0007757249	CAPTR 000470 0000UF 0063V	FDS 840	17	17	0	£35.02
4901808109	CAPTR 000560 0000PF V	1500	3	3	0	£0.18
0005108078	CAPTR 000560 0000PF 0050V CS190	2900	16	16	0	£1.28
0007752802	CAPTR 000560 0000PF 0063V	146-456	34	34	0	£1.02
0007760355	CAPTR 000660 0000PF 0100V 05% MICA DIPPED RAD	D40P MOD43	3	3	0	£1.05
0007758330	CAPTR 000660 0000PF 0300V MICA 05% RADIAL	DRS 300	108	108	0	£42.12
0000009536	CAPTR 000660 0000PF 0350V +-05%	7500	3	3	0	£0.90
0000048443	CAPTR 000680 0000UF 0020V	D20V VDUK/	14	14	0	£28.88
0007760356	CAPTR 000680 0000PF 0100V 02% MICA DIPPED RAD	D40P MOD43	3	3	0	£1.11
4902595145	CAPTR 000680 0000PF 050V CER RAD 4902595145	MR055A821JAA	187	187	0	£37.40
0007725311	CAPTR 001000 0000PF 0050V	EDS 80 FHD	7	7	0	£1.26
000053111	CAPTR 001000 0000UF 0016V 20% ELECTROLYTIC AL	D3V PV2	33	33	0	£4.62
000000538	CAPTR 001000 0000UF 0025V ELECT	80005311	5	5	0	£0.05
4901958110	CAPTR 001000 0000UF 0050V	4901958110	12	12	0	£4.56
7014285023	CAPTR 001000 0000UF 0063V CS247	DATA CHECK	6	6	0	£7.20
000019328	CAPTR 001000 0000UF 0063V CS247	7500	1	1	0	£5.14
000019571	CAPTR 001000 0000UF 0075V	0714640	6	6	0	£27.96
0005110391	CAPTR 001500 0000UF 0010V CS143	7500	1	1	0	£0.90
0007758292	CAPTR 001800 0000UF 07.5V ELECT RADIAL	FDS 160	78	78	0	£117.00
0EE0201158	CAPTR 002000 0000UF 0030V ELECT	2903-4 190	7	7	0	£13.09
4901958103	CAPTR 002200 0000UF 0025V	EE0201158	9	9	0	£0.09
4901958004	CAPTR 002200 0000UF 0025V	675314	2	2	0	£0.64
0005090164	CAPTR 002200 0000UF 0025V CS128	4901958004	30	30	0	£53.10
0007723915	CAPTR 002200 0000UF 0040V ELECT	5090164	4	4	0	£7.28
0007720662	CAPTR 003000 0000UF 0040V ELECT	9755 0922	2	2	0	£84.84
0005110273	CAPTR 003300 0000UF 0040V CS128	97632072	4	4	0	£8.48
4901958109	CAPTR 004700 0000UF 0016V	5110273	35	35	0	£23.10
0000019341	CAPTR 004700 0000UF 0025V ELECT	901958109	26	26	0	£75.40
		JF10447T025FF	26	26	0	

0007821953	CAP DRIVE MTR RUN	NORTEL	NT21520897	4	4	0	£13.64
0066007614	CAP END	ME29	86007914	4	4	0	£0.28
0080048091	CAP FUSEHOLDER FITS 60048090	MARS DEFAU	FITS SIZE D 16A 250V	12	12	6	£3.48
0007739343	CAP HUB HIGHSPEED	MTU	403375701	28	22	0	£29.68
DEE0208382	CAP LENS ENG TO G34821521A13	MARS DEFAU	WW002205	2	2	0	£2.46
0007724110	CAP LEVER PLASTIC CHARCOAL GREY	OFFPTR OUM	80707-01	9	9	0	£13.05
0007750856	CAP PAPER END	OFFPTR 150	7750856	25	25	0	£8.75
0007756626	CAP RIBBON DRIVE LP2000	LPTP LP200	477961	20	20	0	£85.00
0007726555	CAP ROLO	MTU 60XB	78641	15	15	0	£8.45
4901669904	CAP SWITCH	ME29	042-9016699-04	3	3	0	£0.27
0007824024	CAP PF SENSOR	LPTP	341992	1	1	0	£7.33
0007823999	CAP	NORTEL	NT52325121	2	2	0	£1.10
0007830346	CAPPING	NORTEL	NT52325205	2	2	0	£0.28
0085827311	CAPSTAN	LPS 14Z	1042238	4	4	0	£153.32
0005401345	CAPSULE F02444/25 LINK UK KCL TERMILINK	MTU	85627311	1	1	0	£523.37
0007821838	CAPTR	OPD WSTNJK	5401345	6	6	0	£27.54
0007821837	CAPTR	NORTEL	NT661005-7	17	17	0	£1.53
0007821855	CAPTR	NORTEL	NT661006-1	17	17	0	£5.10
0007821854	CAPTR	NORTEL	NT661138-1	7	7	0	£1.38
0007821852	CAPTR	NORTEL	NT661138-1	7	7	0	£5.04
0007821849	CAPTR	NORTEL	NT661113-1	7	7	0	£4.55
0007821847	CAPTR	NORTEL	NT661098-5	3	3	0	£3.42
0007821846	CAPTR	NORTEL	NT661060-3	14	14	0	£14.00
0007821845	CAPTR	NORTEL	NT661071-1	1	1	0	£0.30
0007821844	CAPTR	NORTEL	NT661054-5	7	7	0	£1.89
0007821843	CAPTR	NORTEL	NT661054-3	3	3	0	£0.81
0007821840	CAPTR	NORTEL	NT661033-5	3	3	0	£2.64
0007821839	CAPTR	NORTEL	NT661031-2	6	6	0	£218.46
0007821851	CAPTR	NORTEL	NT66100875	7	7	0	£6.58
0007823450	CAPTR	NORTEL	NT66100659	5	5	0	£4.40
0007823352	CAPTR	NORTEL	NT66100651	13	13	0	£8.32
0007823456	CAPTR	NORTEL	NT661096-3	7	7	0	£12.88
0007824765	CAPTR	NORTEL	NT52211668	23	23	0	£14.95
0007824744	CAPTR	NORTEL	NT894026-9	2	2	0	£2.64
0007823965	CAPTR	NORTEL	NT52334454	2	2	0	£1.68
0007823964	CAPTR	NORTEL	NT52334583	2	2	0	£2.18
0007823963	CAPTR	NORTEL	NT52212852	2	2	0	£0.42
0007823962	CAPTR	NORTEL	NTA0258613	2	2	0	£0.34
0007823961	CAPTR	NORTEL	NT52211690	22	22	0	£31.68
0007823960	CAPTR	NORTEL	NT52164122	12	12	0	£7.56
0007823726	CAPTR	NORTEL	NT52132182	92	92	0	£38.64
0007824028	CAPTR	NORTEL	NT52132157	93	93	0	£38.13
0007824054	CAPTR	NORTEL	NT52132156	40	40	0	£30.80
0007824014	CAPTR	NORTEL	NT52131110	69	69	0	£18.63
0007824042	CAPTR	NORTEL	NT661005-2	17	17	0	£1.70
0007824039	CAPTR	NORTEL	NT661003-4	30	30	0	£31.80
0007824055	CAPTR	NORTEL	NT52325139	2	2	0	£2.90
0007824027	CAPTR	NORTEL	NT52325266	2	2	0	£0.32
0007824018	CAPTR	NORTEL	NT52325168	2	2	0	£2.88
0007824017	CAPTR	NORTEL	NT52325157	2	2	0	£0.92
0007824016	CAPTR	NORTEL	NT52325155	2	2	0	£0.46
0007824015	CAPTR	NORTEL	NT52325280	2	2	0	£1.84
0007824056	CAPTR	NORTEL	NT52325138	4	4	0	£1.60
0007824055	CAPTR	NORTEL	NT52325106	2	2	0	£1.18
0007824054	CAPTR	NORTEL	NT52325085	2	2	0	£0.56
0007824053	CAPTR	NORTEL	NT52325107	2	2	0	£2.72
0007824052	CAPTR	NORTEL	NT52325091	2	2	0	£1.30
0007824051	CAPTR	NORTEL	NT52325082	2	2	0	£1.18
0007824050	CAPTR	NORTEL	NT52325156	2	2	0	£5.08
0007824049	CAPTR	NORTEL	NT52325392	2	2	0	£3.43
0007824048	CAPTR	NORTEL	NT52326186	7	7	0	£0.62
0007824047	CAPTR	NORTEL	NT52212148	2	2	0	£0.66
0007824046	CAPTR	NORTEL	NTSY05116	2	2	0	£2.25
0007824045	CAPTR	NORTEL	NT52325182	3	3	0	£8.30
0007824044	CAPTR	NORTEL	NT52326171	9	9	0	£4.41
0007824043	CAPTR	NORTEL	NT52325281	7	7	0	£1.44
0007824042	CAPTR	NORTEL	NT52325366	9	9	0	£1.02
0007824041	CAPTR	NORTEL	NT52325358	2	2	0	£0.34
0007824040	CAPTR	NORTEL	NT52325354	2	2	0	£0.52
0007824039	CAPTR	NORTEL	NT52325342	2	2	0	£0.52

0007824057	CAPTR	NTS23283	2	2	0	£0.48
0007823978	CAPTR	NTS2251647	2	2	0	£0.34
0007823985	CAPTR	NTS2251800	2	2	0	£0.40
0007823984	CAPTR	NTS2251760	2	2	0	£0.26
0007823983	CAPTR	NTS2251778	2	2	0	£0.28
0007823982	CAPTR	NTS2251692	1874	1874	0	£655.90
0007823986	CAPTR	NTS2252500	2	2	0	£0.06
0007823980	CAPTR	NTS2251884	2	2	0	£0.38
0007823971	CAPTR	NTS2212838	2	2	0	£0.56
0007823977	CAPTR	NTS221504	7	7	0	£1.47
0007823976	CAPTR	NTS2213040	4	4	0	£2.32
0007823974	CAPTR	NTS2213023	2	2	0	£0.12
0007823969	CAPTR	NTS2212815	2	2	0	£0.26
0007824008	CAPTR	NTS2256370	2	2	0	£0.72
0007824091	CAPTR	NTS2326140	9	9	0	£4.14
0007823981	CAPTR	NTS2251888	2	2	0	£0.38
0007824005	CAPTR	NTS2256219	1	1	0	£0.24
0007824007	CAPTR	NTS2256251	2	2	0	£0.26
0007824006	CAPTR	NTS2256244	7	7	0	£0.91
0007823987	CAPTR	NTS2253000	7	7	0	£1.40
0007824002	CAPTR	NTS2256214	3	3	0	£0.66
0007823989	CAPTR	NTS2254062	2	2	0	£0.14
0007823993	CAPTR	NTS2253252	2	2	0	£0.30
0007823988	CAPTR	NTS2256204	2	2	0	£0.52
0007823992	CAPTR	NTS2256202	2	2	0	£0.20
0007823988	CAPTR	NTS2253099	3	3	0	£3.75
0007823990	CAPTR	NTS2254018	2	2	0	£0.14
0007714503	CAPTR	7714503	5	5	0	£30.70
0007823186	CAPTR	NTSYC05029	9	9	0	£5.85
0007823186	CAPTR	NTSYC05032	3	3	0	£1.77
0007823187	CAPTR	NTSYC05030	3	3	0	£2.22
0007823189	CAPTR	NTSYC05033	3	3	0	£7.62
0007823185	CAPTR	NTSYC05028	2	2	0	£3.52
0007824094	CAPTR	NTSYC05115	2	2	0	£0.14
0007823233	CAPTR	NTSYC06058	3	3	0	£1.44
0007766046	CAPTR	0670007700	8	8	0	£197.68
0007823215	CAPTR	NTS2211878	2	2	0	£1.18
0007823222	CAPTR	NTSYC05127	2	2	0	£0.38
0007751949	CAPTR	ROU85B102KLSAC	17	17	0	£0.17
0007733695	CAPTR	7733695	173	173	0	£13.84
0007754168	CAPTR	CS032695000	13	13	0	£1.04
0080009717	CAPTR	80009717	1	1	0	£0.02
0090006043	CAPTR	FKC31NF	14	14	0	£1.26
0005007456	CAPTR	5007456	9	9	0	£1.44
0007823238	CAPTR	NTS2252732	8	8	0	£0.80
0090048285	CAPTR	80048285	269	269	0	£21.52
0080048284	CAPTR	SR155C15 2MAA	136	136	0	£12.24
0007796964	CAPTR	308A2002K2152	30	30	0	£0.60
0060000304	CAPTR	80000304	29	29	0	£0.29
0007752011	CAPTR	OFFPRINTER	12	12	0	£0.96
0005110960	CAPTR	5110960	5	5	0	£1.15
0007732762	CAPTR	OFFPTR R16	14	14	0	£1.82
0005108086	CAPTR	403E0100AD272J	5	5	0	£1.00
0060009160	CAPTR	80009160	1	0	1	£1.00
0007732306	CAPTR	7732306	43	43	0	£1.29
0007733103	CAPTR	7733103	7	7	0	£0.49
0060009643	CAPTR	80009643	8	8	0	£0.56
0080019588	CAPTR	CL563YJ6	10	10	0	£0.30
0007752605	CAPTR	80009278	8	8	0	£6.80
0080009278	CAPTR	44A418646-2G10	9	9	0	£10.35
0007713708	CAPTR	NTS2252360	7	7	0	£0.72
0007823237	CAPTR	9025952-04	36	36	0	£0.91
4902595204	CAPTR	7731967	184	184	0	£9.20
0007731967	CAPTR	TDC103Z	10	10	0	£5.30
0007731770	CAPTR	7731530	24	24	0	£1.44
0007731530	CAPTR	CW-20A103K	51	51	0	£3.06
4900437411	CAPTR	MKT1818-31025 5%	20	20	0	£1.80
0060005495	CAPTR	SLM13	74	74	0	£5.92
0007759006	CAPTR	CS032875000	16	16	0	£49.28
0007754086	CAPTR	CS032875000	8	8	0	£1.44

0000050648	CAPTR 000000 0150UF 0050V CER	OPD WSTNJK	80050648	37	37	0	£1.48
0007751769	OFFPTR 150	OFFPTR 150	18080692	17	12	0	£0.72
0007757071	OFFPTR ML1	OFFPTR ML1	306A4100G2223	86	86	0	£30.36
0006060455	CAPTR 000000 0220UF 0100V	OPD WSTNJK	MKS4 0 022UF 2% 100V	7	7	0	£3.08
0007733427	CAPTR 000000 0220UF 0100V	OFFPTR ML8	LP-8449-223	13	13	0	£1.17
0007755531	CAPTR 000000 0220UF 0100V FILM	ME29	107542	17	17	0	£1.02
0007755531	CAPTR 000000 0220UF 0250V POLY	MARS DEFAU	KP1838-333 166H	3	3	0	£0.51
0000019442	CAPTR 000000 0330UF 0100V CS232	LPTR	80009697	8	8	0	£1.04
0000009697	CAPTR 000000 0330UF 0100V PETP	LPTR PBS 3	44875451	4	4	0	£3.44
0007731970	CAPTR 000000 0470UF 5%	MARS DEFAU	7814387	7	7	0	£5.18
0007814387	CAPTR 000000 0470UF 0025V CERAM DISC -20/+80%	MARS DEFAU	292CX7R473M050E	24	24	0	£1.44
0000009490	CAPTR 000000 0470UF 0050V CER	MARS DEFAU	80000988	9	9	0	£0.63
0000009698	CAPTR 000000 0470UF 0100V PETP	MARS DEFAU	5110381	11	11	0	£1.10
0005110361	CAPTR 000000 0470UF 0250V CS145	MARS DEFAU	344-41473	27	27	0	£1.35
0005011869	CAPTR 000000 0470UF 0250V PETP	LPTR PBS 3	7731978	24	24	0	£27.84
0007731976	CAPTR 000000 1000UF	NORTELE	NT03680000	231	231	0	£36.98
0007824376	CAPTR 000000 1000UF 1%	LPTR PBS 3	96308015	3	3	0	£11.01
0007731978	CAPTR 000000 1000UF CERAMIC -20%+80% RAD	NTWKMP5	024413F	16	16	0	£3.20
0007758398	CAPTR 000000 1000UF 0025V CER	LPTR PBS11	80009498	9	8	1	£0.63
0000009498	CAPTR 000000 1000UF 0025V CER	OFFPTR R13	7733688	2	2	0	£0.28
0007733688	CAPTR 000000 1000UF 0025V CER	OFFPTR R13	7733692	10	10	0	£1.60
0007733692	CAPTR 000000 1000UF 0025V CER	OFFPTR ML1	303A600923104	32	32	0	£2.56
0007756967	CAPTR 000000 1000UF 0050V	OFFPTR ML8	LP-8486	16	16	0	£1.60
0007733432	CAPTR 000000 1000UF 0050V CER	OFFPTR R13	7733688	116	116	0	£36.58
0007733689	CAPTR 000000 1000UF 0050V CER	MARS DEFAU	051285H	48	48	0	£3.38
0007758314	CAPTR 000000 1000UF 0050V CER +/-20% Z5U AXIAL	MARS DEFAU	58570G	37	37	0	£4.44
0007820467	CAPTR 000000 1000UF 0050V CERAMIC	NORTELE	303A042023104	16	16	0	£1.28
0007757281	CAPTR 000000 1000UF 0050V CK92F-1H104Z7 SUJ MT	OFFPTR ML1	94833987	2	2	0	£4.44
0007713787	CAPTR 000000 1000UF 0100V	LPTR	0244220M	1	1	0	£1.26
0007814502	CAPTR 000000 1000UF 0100V +/-010% DISC CERAMIC	MARS DEFAU	5024032	2	2	0	£0.26
0005024032	CAPTR 000000 1000UF 0100V CS21	OFFPTR LX2	80000105	119	119	0	£1.19
0000000105	CAPTR 000000 1000UF 0160V PETP	MAG TAPE 1	22941A	17	17	0	£0.51
0007814510	CAPTR 000000 1000UF 025V CER	MARS DEFAU	LO850808	3	3	0	£5.52
0000850808	CAPTR 000000 1000UF 0500V PAPER	MARS DEFAU	CS127	8	8	0	£0.56
0005101207	CAPTR 000000 1500UF 0100V CS127	MTU	CS032103-00	4	4	0	£1.24
0007804485	CAPTR 000000 2000UF 0016V 0020% TANTALUM BEAD	MARS DEFAU	143-882	55	55	0	£9.90
0007804663	CAPTR 000000 2200UF 0063V POLY MKS2 SERS RADIA	LPTR	1500474X903582	32	32	0	£3.84
0005029429	CAPTR 000000 4700UF 0035V CS174	MARS DEFAU	95305073	2	2	0	£3.80
0007714697	CAPTR 000000 4700UF 0050V MYLAR	NTWKPRNT	1062 20 90-503	11	11	0	£6.27
0007823172	CAPTR 000001 0000UF 0025V	NORTELE	NTA0288445	2	2	0	£0.20
0007750025	CAPTR 000001 0000UF 0025V	OFFPRINTER	18041275	3	3	0	£1.02
0007823172	CAPTR 000001 0000UF 0025V ELECT	KEY EDIT	7707194	6	6	0	£1.68
0007732091	CAPTR 000001 0000UF 0035V	NTWKMP5	0198997G	7	7	0	£7.84
0007707194	CAPTR 000001 0000UF 0035V 10% TANT AXIAL	OFFPRINTER	18041018	16	16	0	£0.96
0007815518	CAPTR 000001 0000UF 0050V	OFFPTR ML1	304A1040A2109	35	35	0	£2.10
0007732045	CAPTR 000001 0000UF 0100V	OFFPTR ML1	304A1041A2109	36	36	0	£2.88
0007759698	CAPTR 000001 0000UF 0100V	OFFPTR ML8	LP-8519-40	1	1	0	£0.13
0007757067	CAPTR 000001 0000UF 0100V ELEC	NORTELE	NT52132178	3	3	0	£4.05
0007733468	CAPTR 000001 0000UF 0200V	NORTELE	NT52251828	2	2	0	£0.92
0007823207	CAPTR 000001 0000UF 100V	NORTELE	NT52251814	2	2	0	£0.56
0007823236	CAPTR 000001 0000UF 100V	MOOMIAL	7760456	85	85	0	£34.85
0007823235	CAPTR 000001 8000UF 0250V 15% 8022A RADIAL	MARS DEFAU	7727357	8	8	0	£7.60
0007760456	CAPTR 000002 2000UF 0035V	MTU 80KB	CS03271600	1	1	0	£1.01
0007727357	CAPTR 000002 2000UF 0035V	OFFPRINTER	18041019	15	15	0	£1.20
0007752092	CAPTR 000002 2000UF 0050V ELECT	LPTR PBS 7	94832017	6	6	0	£14.04
000776230	CAPTR 000002 7000UF 0035V TANT	MARS DEFAU	4201848100	6	6	0	£8.88
4201848100	CAPTR 000002 7000UF 0035V TANT	MARS DEFAU	GXC26004	14	14	0	£0.14
4902412401	CAPTR 000003 3000PF VAR	MARS DEFAU	SRI71A3R3DAA	2	2	0	£0.18
0005101238	CAPTR 000003 3000PF 0100V CS160	OFFPTR ML1	304A1041A2339	36	36	0	£2.88
0007756965	CAPTR 000003 3000UF 0025V TANT	MICROPOLIS	18333049	6	6	0	£3.66
0007730663	CAPTR 000003 3000UF 0025V TANT	OFFPTR ML1	304A1041A2339	301	301	0	£21.07
0007757070	CAPTR 000003 3000UF 0100V	KEY EDIT	22405002-1001	4	4	0	£4.52
0007713693	CAPTR 000004 0000UF 0150V	MTU	76878900	23	19	4	£135.47
0007727479	CAPTR 000004 0000UF 0370V	OPD COL50H	CA478H8	83	83	0	£6.64
0007752582	CAPTR 000004 7000UF 0035V ELEC	MARS DEFAU	CAP 4 7UF	15	15	0	£0.80
0007814378	CAPTR 000006 5000UF 0035V	NORTELE	NT52325376	2	2	0	£0.68
0007824088	CAPTR 000008 0000UF 0660V	LPTR LM40	44682868	47	37	10	£1,529.85
0007733400	CAPTR 000009 0000PF 0050V	NORTELE	NTAO287350	2	2	0	£0.24
0007822660	CAPTR 000010 0000PF 0100V 2%	MTU	CS-03268600	17	17	0	£1.02
0007754139	CAPTR 000010 0000UF 0016V	MARS DEFAU	7732309	5	5	0	£0.75

Item No.	Description	QTY	Unit	Price	Total
0007731529	CAPTR 000010 0000UF 0016V ELEC	6	0	£0.96	£0.96
0007731396	CAPTR 000010 0000UF 0016V TANT	1	0	£0.17	£0.17
0007731396	CAPTR 000010 0000UF 0020V TANT	1	0	£2.64	£2.64
0007731396	CAPTR 000010 0000UF 0025V TANT	6	0	£0.52	£0.52
0007712167	KEY EDIT	2	0	£0.42	£0.42
0007712167	MARS DEFAU	7	0	£13.77	£13.77
0007814706	CAPTR 000010 0000UF 0035V ELECT RADIAL	3	0	£3.78	£3.78
0007750022	CAPTR 000010 0000UF 0040V	2	0	£1.92	£1.92
0007824100	CAPTR 000010 0000UF 0050V	32	0	£2.86	£2.86
0007756969	CAPTR 000010 0000UF 0050V	36	0	£2.59	£2.59
0007757068	CAPTR 000010 0000UF 0050V	7	0	£1.40	£1.40
0007815525	CAPTR 000010 0000UF 0063V ELECT	7	0	£211.86	£211.86
0007804194	CAPTR 000010 0000UF 0250V 20% 85 DEG C RAD/ELEC	6	0	£1.56	£1.56
0007731147	CAPTR 000012 0000UF 0660V	12	0	£0.83	£0.83
0007804186	CAPTR 000015 0000PF 1 0KV CERAMIC DISC	1	0	£0.78	£0.78
0007803655	CAPTR 000015 0000PF 0020V 20% AXIAL TANTALUM	3	0	£0.25	£0.25
0007823206	CAPTR 000015 0000UF 0200V	5	0	£5.28	£5.28
0007821842	CAPTR 000020 00PF 1000V	33	0	£6.72	£6.72
0007758211	CAPTR 000022 0000NF CERAMIC	28	0	£1.12	£1.12
0007758223	CAPTR 000022 0000NF 0050V CERAMIC 2F4 -20% +80%	14	0	£1.85	£1.85
0007751991	CAPTR 000022 0000PF 0050V +-10%	5	0	£0.80	£0.80
0007759007	CAPTR 000022 0000PF 0063V 01% PISTYRENE AXIAL	1	0	£0.26	£0.26
0007754145	CAPTR 000027 0000PF 0050V CS190	1	0	£4.95	£4.95
0007731524	CAPTR 000022 0000UF 0010V ELEC	11	0	£9.31	£9.31
0007729168	CAPTR 000022 0000UF 0016V TAG	49	0	£17.64	£17.64
0007733638	CAPTR 000022 0000UF 0025V ELEC	63	0	£1.02	£1.02
0007823200	CAPTR 000022 0000UF 0060V	17	0	£5.22	£5.22
0005106082	CAPTR 000027 0000PF 0050V CS190	6	0	£1.12	£1.12
0007759008	CAPTR 000027 0000PF 0063V 01% PISTYRENE AXIAL	14	0	£2.15	£2.15
0007752043	CAPTR 000033 0000PF 0050V	5	0	£0.64	£0.64
0007759009	CAPTR 000033 0000PF 0350V MICA	32	0	£12.00	£12.00
0000009615	CAPTR 000033 0000UF 0016V	50	0	£8.02	£8.02
0007824313	CAPTR 000033 0000UF 0035V	2	0	£0.56	£0.56
0007824069	CAPTR 000033 0000UF 0063V ELECT	7	0	£2.52	£2.52
0000005062	CAPTR 000033 0000UF 0080V	3	0	£0.28	£0.28
0007823208	CAPTR 000035 0000UF 035V	2	0	£4.14	£4.14
0007824074	CAPTR 000039 0000PF 0050V CERAMIC +-10% COG	18	0	£2.16	£2.16
0007758226	CAPTR 000047 0000NF 0050V CERAMIC +-20% XR7	9	0	£1.30	£1.30
0007758227	CAPTR 000047 0000NF 0050V CERAMIC +-20% XR7	13	0	£4.52	£4.52
0007754140	CAPTR 000047 0000UF 0020V TANT	2	0	£14.04	£14.04
4900547799	CAPTR 000047 0000UF 0020V TANT	108	0	£19.20	£19.20
0007733472	CAPTR 000047 0000UF 0050V ELEC	80	0	£1.36	£1.36
0007753371	CAPTR 000047 0000UF 0100V ALUM	6	0	£7.20	£7.20
0005130958	CAPTR 000047 0000PF 0050V	36	0	£0.96	£0.96
0007757062	CAPTR 000056 0000PF 0350V MICA	96	0	£9.60	£9.60
0000009985	CAPTR 000068 0000PF 0350V MICA	64	0	£8.00	£8.00
0007823209	CAPTR 000068 0000UF 0200V	2	0	£1.15	£1.15
0007822864	CAPTR 000068 0000UF 400V	1	0	£1.40	£1.40
0007724461	CAPTR 000070 0000UF 0015V ELECT	10	0	£0.80	£0.80
0005110918	CAPTR 000100 0000PF 0100V CS160	16	0	£2.60	£2.60
0000000722	CAPTR 000100 0000UF 0060V3	35	0	£19.04	£19.04
0007756970	CAPTR 000100 0000UF 0010V	34	0	£0.55	£0.55
0005020927	CAPTR 000100 0000UF 0010V CS174	5	0	£1.12	£1.12
0007733469	CAPTR 000100 0000UF 0010V ELEC	16	0	£1.35	£1.35
0007803477	CAPTR 000100 0000UF 0025V ELECT RADIAL	9	0	£4.97	£4.97
0007754197	CAPTR 000100 0000UF 0025V ELECT	7	0	£0.42	£0.42
0007713664	CAPTR 000100 0000UF 0035V	4	0	£0.96	£0.96
0007822661	CAPTR 000100 0000UF 0050V ELEC	4	0	£0.80	£0.80
0007733471	CAPTR 000120 0000PF 0630V +-01% POLYSTYRENE	2	0	£2.52	£2.52
0007815502	CAPTR 000120 0000UF	2	0	£5.78	£5.78
0007824101	CAPTR 000120 0000UF 0010V 10% TANT AXIAL	6	0	£0.90	£0.90
0007815517	CAPTR 000150 0000NF 0035V CS174	13	0	£0.65	£0.65
0005101186	CAPTR 000150 0000PF	15	0	£1.20	£1.20
0007729210	CAPTR 000150 0000PF 0050V	8	0	£2.52	£2.52
0007751986	CAPTR 000150 0000UF 0063V	6	0	£1.06	£1.06
0007732751	CAPTR 000180 0000PF 0350V MICA	53	0	£2.75	£2.75
0000009584	CAPTR 000180 0000PF 0110V	1	0	£0.15	£0.15
0007724521	CAPTR 000193 0000UF 0110V	1	0	£1.32	£1.32
0007733467	CAPTR 000200 0000PF CER	22	0	£10.08	£10.08
0005106073	CAPTR 000220 0000PF 0050V	36	0	£0.54	£0.54
0007757063	CAPTR 000220 0000PF 0063V RADIAL CER	27	0		
0007814700	CAPTR 000220 0000PF 0063V RADIAL CER	27	0		

0000654804	CAPTR 000220 0000PF 0120V POLY	MARS DEFAU	113-285	13	0	£0.91
0000654804	CAPTR 000220 0000PF 0120V POLY	MARS DEFAU	80009753	2	0	£0.02
0000099753	CAPTR 000220 0000PF 0350V MICA	OFFPTR R16	7733114	11	0	£2.42
000773114	CAPTR 000220 0000UF 0016V ELEC	LPS	513D22TMO16CCA	32	0	£12.48
0007726189	CAPTR 000220 0000UF 0016V ELEC	OFFPTR R16	7731521	6	0	£2.58
0007731521	CAPTR 000220 0000UF 0035V ELEC	MARS DEFAU	841283-A7227-T	3	0	£0.57
4070226800	CAPTR 000220 0000UF 0035V ELEC	MTU	80019830	15	0	£2.65
0000019630	CAPTR 000220 0000UF 0040V CS272	NTWKMP5	060409K	7	0	£0.98
0007815516	CAPTR 000270 0000PF 0630V 01%	OFFPTR OUM	93403	6	0	£5.82
0007729120	CAPTR 000330 0000PF 0100V	MARS DEFAU	MS139IR-330P-J-350	107	0	£48.15
0000099678	CAPTR 000330 0000PF 0350V MICA	MTU	CS032719-00	17	0	£1.70
0007804489	CAPTR 000330 0000PF 0100V 0010% CERAMIC RADIAL	MTU	CS032719-00	17	0	£1.02
0007754141	CAPTR 000390 0000PF 0100V 10%V	OFFPTR 150	16061093	15	0	£1.20
0007751967	CAPTR 000470 0000PF 0050V	OFFPTR R13	7733672	29	0	£4.93
0007733672	CAPTR 000470 0000PF 0050V CER	OFFPTR R13	7733694	37	0	£3.33
0007733694	CAPTR 000470 0000PF 0100V 10% CERAMIC RADIAL	MTU	CS032693-00	17	0	£1.70
0007751780	CAPTR 000470 0000UF 0200V 20%	OFFPTR 150	16041228	1	0	£2.67
0007732750	CAPTR 000470 0000UF 0250V	OFFPTR R16	7732750	4	0	£9.88
0000019626	CAPTR 000560 0000PF 0030V	MARS DEFAU	80019626	7	0	£32.55
0007723926	CAPTR 000560 0000PF 0030V	ME29	9745 0258	6	0	£0.98
0007758966	CAPTR 000560 0000PF 0050V	OFFPTR ML1	303A3006K0561	36	0	£2.88
0007754196	CAPTR 000560 0000PF 0100V 10%	MTU	CS03272100	17	0	£1.19
0000099616	CAPTR 000560 0000PF 0350V MICA	MARS DEFAU	MS139IR-560P-J-350	21	0	£0.21
0007758361	CAPTR 000680 0000PF 0100V CERAMIC 10% RADIAL	NTWKMP5	002244E	7	1	£0.42
0007752048	CAPTR 000680 0000PF 0100V	OFFPTR R16	16060196	16	0	£0.98
0007757066	CAPTR 000680 0000PF 0100V	OFFPTR ML1	303A3020K0681	35	0	£5.60
0005310426	CAPTR 000680 0000UF 0200V	MARS DEFAU	0503720	5	0	£0.75
0007752061	CAPTR 000680 0000UF 0200V	OFFPTR R16	16041220	1	0	£4.76
0007759535	CAPTR 000750 0000UF 0050V ELEC AXL 190 X 42LMM	LPTR LM40	44687750	7	7	£22.40
0007730682	CAPTR 000750 0000UF 0050V ELEC	OFFPTR ML1	303A6012M3102	36	0	£2.16
0007733473	CAPTR 000750 0000UF 0050V ELEC	OFFPTR ML1	050-9019590-06	36	0	£2.52
0007733497	CAPTR 000750 0000UF 0050V ELEC	MARS DEFAU	7758448	442	0	£218.58
4901958006	CAPTR 001000 0000PF 0050V	MARS DEFAU	4900320304	2	0	£2.84
0007758446	CAPTR 001000 0000UF 0200V	MARS DEFAU	23780R	4	4	£0.76
4900320304	CAPTR 001200 0000UF 0035V ELEC	MARS DEFAU	LP-8520-23	2	0	£12.12
0007804011	CAPTR 002200 0000UF 0025V 20% RADIAL ELEC	OFFPTR ML8	100500083	6	0	£22.50
0007733473	CAPTR 003000 0000UF 0060V ELEC	MTU	071493E	1	0	£2.20
0007730682	CAPTR 003000 0000UF 0060V ELEC	MARS DEFAU	LP-8620	5	0	£16.38
0007758996	CAPTR 004400 0000UF 0050V ELEC	OFFPTR ML8	CS03271500	7	0	£0.19
0007754090	CAPTR 004700 0000PF 0100V ~10%	MTU	80003804	1	1	£46.02
0000003604	CAPTR 004700 0000UF 0016V ELEC	MARS DEFAU	050-16472	39	7	£21.42
0005110277	CAPTR 004700 0000UF 0016V ELEC	OFFPTR ML1	304A1109G1472	14	0	£2.70
0007756972	CAPTR 004700 0000UF 0025V CS126	OFFPTR ML1	304A1037C1822	2	0	£1.84
0007756971	CAPTR 004700 0000UF 0042V	OFFPTR 160	16041125	2	0	£2.76
0007752134	CAPTR 008200 0000UF 0025V ELEC	OFFPTR ML1	303A6009K3103	1	0	£2.88
0007756976	CAPTR 010000 0000PF 0050V	OFFPTR ML1	302A402725103	36	0	£4.20
0007756973	CAPTR 010000 0000PF 0250V	MARS DEFAU	ALS20A1098AX	30	0	£108.90
0000019573	CAPTR 010000 0000UF 0016V CS274	ME29	ALT20A103CD025	45	0	£17.46
0000050963	CAPTR 010000 0000UF 0025V	MARS DEFAU	EE0201215	6	0	£5.13
0E E0201215	CAPTR 010000 0000UF 0025V ELEC	LPTR	5034975	1	10	£946.56
0005034975	CAPTR 010000 0000UF 0100V CS48	MTU	80001714	51	0	£131.34
0000001714	CAPTR 015000 0000UF 0016V ELEC	MTU 60KB	PL07917400	33	0	£32.18
0007728629	CAPTR 022000 0000UF 0040V TMLS	NORTEL	708193	1	0	£29.05
0007824946	CAPTR 033000 0000UF 0063V ELKO EYMB -10~15%	LPTR 4410	44A501M46-N40	1	0	£26.82
0007736642	CAPTR 040000 0000UF 0060V DC	LPTR P8113	92632074	5	0	£217.60
0007704149	CAPTR 080000 0000UF 0040V ELEC	LPTR	7704148	1	0	£23.15
0007823217	CAPTR 10PF	NORTEL	NT52212122	2	0	£0.26
0007824004	CAPTR 10PF	NORTEL	NT52256218	2	0	£0.26
0007824877	CAPTR 10UF 50V	NORTEL	NTA0285220	2	0	£0.14
0007824000	CAPTR 120PF	NORTEL	NT52256208	6	0	£0.78
0007823239	CAPTR 15PF	NORTEL	NT5223742	6	0	£1.74
0007823223	CAPTR 15PF 300V	NORTEL	NT52212128	2	0	£0.60
0007823224	CAPTR 22PF 300V	NORTEL	NT52212132	2	0	£0.38
0007823226	CAPTR 330PF 100V	NORTEL	NT52211680	2	0	£1.04
0007824001	CAPTR 390PF 50V	NORTEL	NT52256210	2	0	£0.40
0007823225	CAPTR 39PF 300V	NORTEL	NT52212144	2	0	£0.82
0007824003	CAPTR 47PF	MARS DEFAU	80009137	2	0	£0.26
0000009137	CAPTR DUAL 100220 0000UF 0025V ELEC	MARS DEFAU	5101193	1	1	£0.19
0005101193	CAPTR DUAL 11000 0000UF 0010V CS173	MARS DEFAU	5101193	60	0	£100.20

0005101176	CAPTR DUAL 2X5000 UF 0040V CS173	5101176	5	5	0	£21.05
0007756304	CAPTR HOLDER ASSY	723856Y	5	3	2	£31.05
0007822804	CAPTR MICA 390PF 100V	NT52211684	2	2	0	£0.64
0007824773	CAPTR TANT SOLID 33VFD 10V	NT52325123	2	2	0	£1.42
Disp3						
0007759551	CAP 1X2 FOR KEY OF 00950701	7759551	20	20	0	£16.20
0007949052	CAPTR 000000 2200UF 0100V	BS10212C08	68	68	0	£9.52
0080650119	CAPTR 000000 0001UF 0050V	80500119	236	236	0	£11.60
0090048464	CAPTR 000000 0001UF 0100V	80048464	23	23	0	£1.61
0007756246	CAPTR 000000 0001UF 0100V CERAMIC	SR151A100JNA	17	17	0	£5.10
0007756449	CAPTR 000000 0010PF 0050V MICA	283578	5	5	0	£12.45
0090048015	CAPTR 000000 0010UF 0050V	80048015	90	90	0	£0.90
0007751970	CAPTR 000000 0010UF 0050V	22974E	90	90	0	£1.80
0007752550	CAPTR 000000 0010UF 0050V	22942X	16	16	0	£0.48
4901806112	CAPTR 000000 0010UF 0050V	4901806112	5	5	0	£0.15
0080047876	CAPTR 000000 0010UF 0050V CER	80047876	23	23	0	£0.23
0007734817	CAPTR 000000 0010UF 0100V	CCA1K00N630	83	83	0	£29.68
0007734823	CAPTR 000000 0010UF 1000V CER	2800102004	2	2	0	£0.16
0007732700	CAPTR 000000 0010UF 1500V	CF41K002FKP1	11	11	0	£3.41
0007751875	CAPTR 000000 0012UF 1000V CER	148480	3	3	0	£0.09
0007734284	CAPTR 000000 0015UF 0050V	148-461	7	7	0	£1.47
0007732255	CAPTR 000000 0022UF 0050V	10099	20	20	0	£0.40
0090048464	CAPTR 000000 0022UF 0100V	80048464	5	5	0	£0.95
0080050305	CAPTR 000000 0022UF 0250V 20% MET PAPER AC	80050305	14	14	0	£1.26
0007734811	CAPTR 000000 0033UF 0500V	7734811	27	27	0	£5.40
0007755607	CAPTR 000000 0039UF 0100V POLY	10751	8	8	0	£2.40
0007730941	CAPTR 000000 0047UF 0500V CER	440LD47	17	17	0	£1.02
0007755760	CAPTR 000000 0047UF 83V CERAMIC	ECKF14732VB	81	81	0	£2.43
0007754269	CAPTR 000000 0089UF 0050V	146-693	16	16	0	£0.48
0007755783	CAPTR 000000 0100UF	9018061-24	15	15	0	£1.20
4901806124	CAPTR 000000 0100UF	7731284	33	33	0	£1.65
0007731284	CAPTR 000000 0100UF 0100V CER	CF510K07325	66	66	0	£4.62
0007734792	CAPTR 000000 0100UF 0400V	091045X	9	9	0	£3.96
0007758263	CAPTR 000000 0100UF 1000V CERAMIC DISC	92-58019J	36	36	0	£11.40
0007731280	CAPTR 000000 0100UF 2000V CER	21661X	12	12	0	£5.28
0007751834	CAPTR 000000 0150UF V	9018061-14	16	16	0	£0.56
4901806114	CAPTR 000000 0220UF	060-9018061-28	2	2	0	£1.28
4901806128	CAPTR 000000 0220UF 0050V	SR205C223MNA	1	1	0	£0.05
0007734279	CAPTR 000000 0220UF 0100V CERAMIC	ECKF1J232VB	112	112	0	£10.08
0007756248	CAPTR 000000 0220UF 0250V	CPA22K0R271Y	84	84	0	£7.68
0090048655	CAPTR 000000 0470UF	80048655	17	17	0	£0.34
0007760744	CAPTR 000000 0470UF 0050V CER	78-47324-221	44	44	0	£0.34
0007756228	CAPTR 000000 0470UF 0100V 10% MKS2	146-900	17	17	0	£9.90
0007751848	CAPTR 000000 0680UF 0063V -20+50% CER PLT RAD	0 0680UF 63V 5% CER PLT RD	110	110	0	£14.24
0007750925	CAPTR 000000 1000UF 0025V CER	MKS4 68NF 10% 630V	89	89	0	£24.85
0007732698	CAPTR 000000 1000UF 0035V TANT	740032-1003	71	71	0	£0.39
0080047886	CAPTR 000000 1000UF 0050V	03382X	7	7	0	£1.40
0007731678	CAPTR 000000 1000UF 0050V	146-227	26	26	0	£3.38
4901806136	CAPTR 000000 1000UF 0050V	80047886	443	443	0	£22.15
0007756447	CAPTR 000000 1000UF 0050V	CB01H104ZT	2	2	0	£0.18
0007760155	CAPTR 000000 1000UF 0050V CERMC	4901806136	63	63	0	£1.89
0007734234	CAPTR 000000 1000UF 0250V	242700	7	7	0	£1.82
0007734830	CAPTR 000000 1000UF 0250V	08 10494 072	5	5	0	£1.00
0007734825	CAPTR 000000 1000UF 0250V	146-474	2	2	0	£0.34
0007739691	CAPTR 000000 1000UF 0063V 20% MKS2	CP0J100R352	1	1	0	£0.50
0007756370	CAPTR 000000 2200UF 0250V	781868	123	123	0	£38.13
0007734826	CAPTR 000000 2200UF 0250V	143-676	30	30	0	£0.60
0007751846	CAPTR 000000 4700UF 0035V	19924X	17	17	0	£3.74
0007734226	CAPTR 000000 4700UF 0035V	100-698	1	1	0	£0.37
4901806604	CAPTR 000000 4700UF 0035V TANT	ICL SPEC	4	4	0	£4.76
0007739613	CAPTR 000001 0000UF 0035V TANT	50292D	5	5	0	£0.28
4901806606	CAPTR 000001 0000UF 0450V	196D105X9035HA1	10	10	0	£0.45
0007739894	CAPTR 000002 2000PF 0035V TANT	TWS1/450	86	86	0	£8.88
4901806608	CAPTR 000002 2000UF 0016V TANT	050-9018066-08	137	137	0	£34.25
0007756448	CAPTR 000002 2000UF 0016V TANT	03383X	9	9	0	£4.14
			7	7	0	£1.33

0007755542	CAPTR 000220 0000PF 0050V POLY	PDCUCKOK73	10762	16	0	£0.96
0007755600	CAPTR 000220 0000UF 0016V ELECT	PDCUCKOK73	10747-72	3	0	£1.50
000775524	CAPTR 000220 0000UF 0025V ELECT	PERO 2	71497H	15	0	£1.35
0007751828	CAPTR 000220 0000UF 0063V ELECT	PERO 2	100-841	5	0	£1.30
0007732701	CAPTR 000270 0000PF 0063V	PC1 MOD 10	146452	55	0	£1.65
0007731644	CAPTR 000300 0000PF 0063V	POS TERMIN	CCDB301KOK	27	0	£0.81
0007751947	CAPTR 000390 0000PF 0100V	PERO 2	83018391	17	0	£0.34
0005108077	CAPTR 000470 0000PF	PERO 2	80051351	54	0	£5.40
0007732699	CAPTR 000470 0000PF 0063V	PC1 MOD 10	148455	26	0	£0.78
0006050240	CAPTR 000470 0000UF 0010V ELECT	PDCUCOLKOK	80050240	16	0	£1.60
0007730404	CAPTR 000500 0000UF 0200V	PERO 2	71541X	1	0	£0.29
0007731702	CAPTR 000560 0000PF 0050V	PERO 1	7730M4	1	0	£7.05
0007758296	CAPTR 000680 0000PF 50V CERAMIC +-10% COG	POS TERMIN	CCDB561KOK	26	0	£0.52
0007732241	CAPTR 000620 0000PF 0050V	PC HDA10M	SR211A681JNA	2	0	£1.41
0007734803	CAPTR 001000 0000UF 0025V	PC1 MOD 10	10257	47	0	£0.52
0007739889	CAPTR 001000 0000UF 0025V	PERO 2	CE41K00GE	1	0	£0.17
0007754958	CAPTR 001000 0000UF 0040V	PERO 2	15903H	1	0	£0.70
0007759997	CAPTR 002200 0000PF 0050V Y5P CERAMIC DISC	PC1 MOD 30	830-02182	35	0	£0.70
0007760194	CAPTR 004700 0000PF 0050V Y5P CERAMIC DISC	PCTPDISCLE	08-22224 13C	208	0	£16.64
0007752525	CAPTR 013000 0000UF 0025V ELECT	PC2 MODEL1	CE2M20GM	96	0	£75.46
4901258295	CAPTR 013000 0000UF 0025V ELECT	PCTPMA0BAS	08-47224 13C	5	0	£1.00
0060053467	CAPTR SM 2.2000NF 0050V	PERO 2	ULB1E472M	2	0	£1.48
0007760741	CAPTR SM 22 0000NF 0050V	POS TERMIN	050-001114-024	35	0	£91.35
0060053181	CAPTR SM 22 0000NF 0020V	POS TERMIN	CEG1F68301	26	0	£594.10
0007760740	CAPTR SM 1000 0000PF 50V Z CER	PCTPM95-00	80053487	5	0	£0.34
0060053029	CAPTR SM 150 0000PF 0050V 1206 CS493	PCTPM95-00	76-10494-321	17	0	£0.51
0007760742	CAPTR SM 150 0000PF 0050V J CER	PCTPM95-00	80053029	17	0	£4.59

0080050546	CAPCITOR 000047 0000PF	S251CPLR	80050546	252	0	£7.56
4901178868	CAPTR V	S10	94227234	9	0	£9.81
0007728918	CAPTR 000000 0010UF V	S25	CAC02X7R102K100A	1	0	£0.09
0007730270	CAPTR 000000 0010UF 0050V	S25 MB4 V1	7730270	3	0	£1.83
4900547803	CAPTR 000000 0010UF 0600V	S10	4800647803	5	0	£2.30
0007713682	CAPTR 000000 0010UF 1000V	S10	21102000-1001	13	0	£1.30
0080050462	CAPTR 000000 0022UF	S39 L30	80050462	1	0	£0.36
0007727959	CAPTR 000000 0022UF 0050V CER	S25	7727959	18	0	£2.34
0007730345	CAPTR 000000 0022UF 0100V	S25 MB4 V1	7730345	68	0	£11.56
0007739626	CAPTR 000000 0022UF 0180V +-2.5%	S25 MB4 V1	45-95545-1	0	1	£1.06
0007727927	CAPTR 000000 0100UF 0063V	S25	629-02103	39	0	£1.17
0007730348	CAPTR 000000 0220UF 0250V CS412	S25 MB4 V1	45-93082-1	6	0	£1.80
0080047990	CAPTR 000000 0470UF 0050V CS329	S25 PLU	21-180C31	13	0	£10.53
0060001823	CAPTR 000000 0680UF 0050V CS237	SERVICE AI	80047990	3	0	£0.51
0060048718	CAPTR 000000 1000UF 0050V CER	S25	80001823	468	0	£112.32
0007729429	CAPTR 000000 1000UF 0100V	S25/2 PROC	C192K683K1R1CA	17	0	£5.27
0007753081	CAPTR 000000 1000UF 0100V	SERVICE AI	80048718	867	0	£17.74
0007753016	CAPTR 000000 1000UF 0250V	S25/2 PROC	050-004694-055	14	0	£0.84
4901806618	CAPTR 000000 3300UF 0035V	S25 MB5C V	CF0U100R325	4	0	£1.40
0007730267	CAPTR 000000 4700UF 0350V +-10%	S25 MB4 V1	14239A	2	0	£4.65
0007739824	CAPTR 000003 3000UF 6350V	S25 MB4 V1	CF0U100R325	15	0	£0.56
0007730299	CAPTR 000004 7000UF 0025V	S25 MB4 V1	9018086-18	7	0	£276.00
0007730342	CAPTR 000004 7000UF 0063V ELECT	S25 MB4 V1	ECEAZVS470	345	0	£36.08
0007727953	CAPTR 000004 7000UF 0100V ELECT	S25	7739824	41	0	£14.79
0007727949	CAPTR 000006 8000UF 0100V POLY	S25	ECEAZVS3R3	51	0	£11.28
0007727958	CAPTR 000010 0000PF 0050V CS190	S25	23-10255828	3	0	£236.07
0005108057	CAPTR 000010 0000PF 0050V CS190	S25	08-955-20A01	160	0	£19.65
0007730339	CAPTR 000010 0000UF 0020V	S25 MB4 V1	5108057	184	0	£9.20
0028360842	CAPTR 000010 0000UF 0020V CS294	S25 MB4 V1	7730339	17	0	£54.40
0007730336	CAPTR 000020 0000UF 0025V ELECT	S25/2 PROC	28360842	3	0	£1.32
0007713687	CAPTR 000010 0000PF 0025V ELECT	S25 MB4 V1	41-94150-1	3	0	£6.69
0007728919	CAPTR 000022 0000PF V	S10	22206002-1001	4	0	£3.72
0005110913	CAPTR 000022 0000PF 0100V CS180	S25	CAC02X7R220K100A	92	0	£11.96
0007703163	CAPTR 000022 0000UF 0010V	S39	5110913	20	0	£1.20
			80-550172	1	0	£0.52

4901808656	CAPTR 000022 0000UF 0020V TANT	S25	4901808656	2	2	0	£1.00
0005108063	CAPTR 000033 0000PF 0050V	SERVICE AI	C114C330JZG1CA	73	73	0	£2.19
0007727975	CAPTR 000033 0000PF 0500V	S25	7727975	20	20	0	£9.60
0007720230	CAPTR 000047 0000UF 0035V TANT	SERVICE AI	7720230	7	7	0	£6.72
4902012109	CAPTR 000068 0000UF	S25 M85C V	9020121-09	69	69	0	£1.38
0005076663	CAPTR 000068 0000UF	SERVICE AI	5076663	3	3	0	£2.97
0028350895	CAPTR 000100 0000PF 0050V CER	SERVICE AI	28350895	9	9	0	£0.63
0007727976	CAPTR 000100 0000UF 0016V	S25	7727976	16	16	0	£8.64
0090047520	CAPTR 000100 0000UF 0016V CS272/100U	S25 PLU 24	80047520	107	107	0	£14.98
0007727947	CAPTR 000100 0000UF 0035V	S25	23-10255A89	147	147	0	£99.96
0007727946	CAPTR 000100 0000UF 0063V	S25 M84 VI	41-97007-1	14	14	0	£13.02
0080099725	CAPTR 000150 0000PF 0100V CER	S25	21-180E58	1	1	0	£0.12
0007727969	CAPTR 000150 0000PF 0350V	S25	MS1391R-150PJ-350	7	7	0	£22.40
0007727960	CAPTR 000180 0000PF 0500V	S25/2 PROC	21-180028 (MOTOROLA)	2	2	0	£0.64
0007727951	CAPTR 000220 0000PF	S25	CF3220PZL	93	93	0	£83.70
0007719228	CAPTR 000220 0000UF 0025V ELECT	S25	7727960	13	13	0	£4.28
0005108075	CAPTR 000300 0000PF	SERVICE AI	7727961	9	9	0	£2.07
0007732197	CAPTR 000300 0000PF 0050V CS190	SERVICE AI	050-9025851-34	6	6	0	£0.42
0007727946	CAPTR 000330 0000PF 0200V	SERVICE AI	5108075	23	23	0	£0.69
0007727946	CAPTR 000330 0000UF 0025V	S25	016857EM	22	22	0	£6.36
0007727979	CAPTR 000360 0000PF 0100V	S25	23-10255B87	63	63	0	£211.68
0005108076	CAPTR 000390 0000PF	S25	7727979	5	5	0	£1.95
0007730296	CAPTR 000470 0000PF 0100V CS160	S25 M84 VI	292CCOG391K0508	15	15	0	£1.20
0007732196	CAPTR 000470 0000PF 0200V	SERVICE AI	ECKD2H391KB9	3	3	0	£0.84
0007727948	CAPTR 000470 0000UF 0016V	S25	CS160-B470P	4	4	0	£1.36
0007753010	CAPTR 000470 0000UF 0016V	S25/2 PROC	091641D	3	3	0	£0.57
0007730344	CAPTR 000470 0000UF 0025V	S25 M84 VI	7727948	46	46	0	£17.94
4901958005	CAPTR 000470 0000UF 0035V ELECT	S25	CE3470JFEK	83	83	0	£29.05
0007710911	CAPTR 000470 0000UF 0400V ELECT	S25	41-93856-1	205	205	0	£360.80
0007753012	CAPTR 001000 0000PF	S25/2 PROC	023796X	768	768	8	£115.20
0007730343	CAPTR 001000 0000UF 0016V	S25 M84 VI	7710911	6	6	0	£85.32
0007727977	CAPTR 001800 0000UF 0016V	S25/2 PROC	CCA1K00831H	7	7	0	£2.45
4901337841	CAPTR 002200 0000UF 0025V ELECT	S25	41-93425-1	142	142	0	£116.44
0007729618	CAPTR 002500 0000UF 0200V	S10	23-29544A04	11	11	0	£13.31
0080050117	CAPTR 003300 0000UF 0025V DC CS471D	S10	CE42K20FW	13	13	0	£8.84
0007739173	CAPTR 003700 0000UF 0200V	S25 ADDNL	4901337841	4	0	4	£22.32
0007753020	CAPTR 004700 0000PF 0100V	S25/2 PROC	3802500F200CC2	158	158	0	£1,249.78
0007753030	CAPTR 010000 0000PF	S25/2 PROC	80050117	5	5	0	£3.65
0007753054	CAPTR 022000 0000PF 0063V	S25/2 PROC	CE43K700736D	1	0	1	£14.38
		S25/2 PROC	CF44K70MFKS2	10	10	0	£3.50
		S25/2 PROC	CCS10K0961	34	34	0	£10.54
		S25/2 PROC	CF522K0L2MIN	71	71	0	£22.72

CONN

0080070561	CONN HEADER 2X23WAY SAMTEC MTSW-123-09-S-D-405	D3P MOD A4	80070561	6	6	0	£9.18
0080070199	CONN HEADER 2X25W 90DEG	D3P MOD SM	80070199	7	7	0	£8.26
4902427610	CONN HEADER 2X5WAY 3M 3446-6302	D20P MOD14	4902427610	2	2	0	£1.92
0007757529	CONN HEADER 6WAY	D50F32PORT	781-30620-00	10	10	0	£235.60
0080048775	CONN HEADER 90DEG 4WAY		80048775	2	2	0	£0.26
0080070234	CONN HEADER PIN GRID ARRAY 72PIN	D3P DMOD A	80070234	1	1	0	£6.52
0080999552	CONN HOOD	7500	80999552	89	89	0	£38.27
4902427601	CONN KEY	D20VM110VD	9024276-01	11	11	0	£0.22
0007741122	CONN LOOP BACK 25 IN D MALE	ATM	LOOP25M1	19	19	0	£109.63
0007741121	CONN LOOP BACK 9 IN D FEMALE	ATM	LOOP9F1	17	17	0	£98.09
0080070149	CONN MAINS 003 WAY	D3V MOD303	42 R 02.3212 1.5MM	24	24	0	£10.08
0080048805	CONN OSLAN BARREL	D20P MOD15	80048805	21	21	0	£70.98
4900422202	CONN PIN (SIMILAR TO 80070700)	D20P M25CO	NS-441-B1-MOD	29	29	0	£12.18
0007758832	CONN PIN 4WAY PRESSAC SE220/1544/NAT	DRS 8801	000666D	38	38	0	£7.98
4901107933	CONN PLG 91 OHM 041-000716-001	DRS 20	AMP 31GB0723	4	4	0	£40.48
0007728414	CONN PLG A2391-3	FDC	9591-2103	3	3	0	£0.48
0007702218	CONN PLG NO 2 CDC 70801602	2903-4 190	7702218	2	2	0	£15.56
0080048060	CONN PLG MAINS FASTON	D20P MOD15	80048060	23	23	0	£10.35
0080049193	CONN PLG 64WAY MOLEX 90003-8053	D88P CONT	90003-8053	6	6	0	£5.22
0080019306	CONN PLG 003WAY	1500	80019306	26	26	0	£1.56
0080047058	CONN PLG 009WAY FX	7500	000648H	1	1	0	£0.20
0027440743	CONN PLG 025WAY	7500	27440743	87	87	0	£61.77
0007734390	CONN PLG 025WAY D	D88P CONT	208343 025 011 000	23	23	0	£28.75
0007734391	CONN PLG 050WAY R/ANGLE	D88P CONT	609-5008	7	7	0	£22.12
0080049204	CONN PLG 3X32WAY	D3P MOD A4	80049204	3	3	0	£14.28
0080070747	CONN PLG D 25WAY AMP 344188-2	D2V MOD 30	80070747	1	1	0	£0.80
0007741021	CONN PLUG LOOPBACK SM5	DRS 300	7741021	2	2	0	£15.54
0007741020	CONN PLUG SM4	DRS 300	7741020	2	2	0	£19.34
0080070653	CONN RECEPT 025WAY	D2V MOD203	80070653	21	21	0	£19.74
4901107934	CONN RECEPT 001WAY BNC	1500	4901107934	7	7	0	£4.48
0080009350	CONN RECEPT 006WAY X 2 AMP 925367-6	7500	AMP 1-86148-3	7	7	0	£1.33
0080009372	CONN RECEPT 007WAY CHAS-7W	7500	71200/070	6	6	0	£5.04
0080009320	CONN RECEPT 018WAY AMP 925367-9	7500	1-86148-6	87	87	0	£206.19
0080071360	CONN RECEPT 15DWAY ITT 077162-009	D3P MOD SM	80071360	4	4	0	£18.16
0080071371	CONN RECEPT D 25WAY AMP 344823-1	D3V MOD303	80071371	1	1	0	£1.35
0080047529	CONN SKT BNC 50 OHMS	D20V M6 VD	80047529	6	6	0	£8.34
0005081128	CONN SKT GUIDE	1900	5081128	34	34	0	£4.76
0080007509	CONN SKT TRANSISTOR	2903-4 190	80007509	32	32	0	£6.40
0007733764	CONN SKT 003WAY	D88P CONT	124011X	30	30	0	£41.10
0080070037	CONN SKT 007WAY CRT	D20V DISVD	80070037	19	0	19	£51.30
0027440747	CONN SKT 015WAY	2900	DA-15S	30	30	0	£69.30
4901733207	CONN SKT 016WAY IC DILIC	D20P MOD50	4901733207	25	25	0	£2.25
0007734389	CONN SKT 025WAY D	D88P CONT	108383 025 011 000	15	15	0	£22.80
0027440748	CONN SKT 025WAY D S/81/048	1900	27440748	310	310	0	£232.50

CONN

4000088005	CONN SKT 16PN	D20P LEV 1	4000088005	3	3	0	£2.43
0080047318	CONN SKT CRIMP DU PONT 47706-001	D3P MOD A4	80047318	5	5	0	£0.85
0080070560	CONN SKT HEADER 2X23WAY BSW-123-04-S-D	D3P MOD A4	80070560	3	3	0	£6.06
0080049210	CONN SKT 84WAY	D3P MOD A	80049210	7	7	0	£0.63
0007757578	CONN SKT 8WAY	D50F32PORT	781-20821-00	1	1	0	£5.44
0007757536	CONN SKT D TYPE 9WAY	D50F32PORT	781-50104-00	1	1	0	£6.69
4003065158	CONN TERMNL 25WAY AMP643124-1	D20P M128S	4003065158	9	9	0	£4.59
0036707580	CONNECTION DRAIN SSM	ESSEX	36707580	3	0	3	£578.91
0007961575	CONNECTOR 25-POL	50814/095		17	17	0	£23.97
0007962149	CONNECTOR 25 POL STRAIGHT	50814/188		45	45	0	£9.90
7002280003	CONNECTOR 3 PIN MNL HDR	DATACHECK	7002280003	8	8	0	£0.96
7002279004	CONNECTOR 4 PIN MNL	DATACHECK	008-002279-004	37	37	0	£1.85
7002397001	CONNECTOR 42 PIN SOCKET	DATACHECK	008-002397-001	508	508	0	£162.56
0007944505	CONNECTOR ASSY 25-PIN	50814/048	KDY1981301	3	3	0	£26.34
0007946481	CONNECTOR BOARD	50814/064	7946481	5	5	0	£15.30
0007949455	CONNECTOR COVER DX2000	FSA	D860-1144-X398	2	2	0	£2.42
7007475004	CONNECTOR HSG 1-87175-0	DATACHECK	008-007475-004	19	19	0	£4.56
0007937161	CONNECTOR KIT ASSY TELE/EMI	50814/096	9081-003	1	1	0	£23.20
0007741118	CONNECTOR TEST LOOP 9 PIN D FEMALE	ATM	HULOOPIF	38	38	0	£166.06
0007741117	CONNECTOR TEST LOOP 9 PIN D MALE	ATM	HULOOPM1	37	37	0	£161.69

Disp2

0007738821	CONN	LPS 10	1016440	1	1	0	£21.82
0007752062	CONN 171826-8	OFFPRINTER	11030602	6	6	0	£1.20
0007753333	CONN FOR 006238/01 PRINTHEAD	OFFPTR ML2	3PB4025-1242P1	13	13	0	£36.66
0007752672	CONN 002WAY	OFFPTRGP17	11020901	17	17	0	£1.02
0007733447	CONN 003WAY	OFFPTR ML8	LP-5523-3	5	5	0	£0.65
0007752675	CONN 003WAY	OFFPTRGP17	11020845	17	17	0	£1.02
0007733885	CONN 003WAY 5046-3A	OFFPTR R16	7733885	7	7	0	£1.12
0007733488	CONN 004WAY	OFFPTR ML8	LP-5523-4	87	87	0	£17.40
0007733448	CONN 006WAY	OFFPTR ML8	LP-5523-6	14	14	0	£4.06
0007733719	CONN 007WAY 171825-7	OFFPTR R13	7733719	218	218	0	£52.32
0007733452	CONN 010WAY	OFFPTR ML8	4LP-5850-10	64	64	0	£31.36
0007733450	CONN 010WAY	OFFPTR ML8	LP-5523-10	4	4	0	£1.24
0007733889	CONN 010WAY 5046-10AG	OFFPTR R16	7733889	2	2	0	£1.72
0007754154	CONN 020WAY SCOTCHFLEX	MTU	AS/002292/00	1	1	0	£3.94
0007757056	CONN 30 WAY	OFFPTR ML1	224A3376P0300	26	26	0	£30.16
0007757057	CONN 40 WAY	OFFPTR ML1	224A1160P0400	34	34	0	£113.56
0007757058	CONN 6 WAY	OFFPTR ML1	224A3462P0060	35	35	0	£2.80
0007757059	CONN 9 WAY	OFFPTR ML1	221A1525P0080	11	11	0	£7.92
0007758528	CONN AKT-60	OFFPTR ML3	224A1152P0600	3	3	0	£11.70
0007757206	CONN ASSY FIRST-USE SENSOR	OFFPTR P44	PJWNXP4450M	3	3	0	£2.01
0080047157	CONN BLOCK 2WAY CURTIS 1502	ME29	80047157	1	1	0	£0.26
0080047897	CONN BLOCK 20WAY PYE EB20 (EDGE)	ME29	80047897	22	22	0	£6.38

CONN

0080047584	CONN BLOCK 23WAY BULGIN 78023	ME29	80047584	7	0	0	£20.30
0007804105	CONN BLOCK 012WAY POLYETHYLENE TYPE 2A	MARS DEFAU	423-655	6	0	0	£1.32
4000978031	CONN BLOCK 4WAY	ME29	673522	3	0	0	£36.96
0007830365	CONN BLOCK 8-POLE FEMALE	NTWKPRNT	1067 14 66-50/5	34	0	0	£31.96
0007757055	CONN CENTRONICS I/F 90'	OFFPTR ML1	220A1423P0361	36	0	0	£46.08
0007824188	CONN CIRCULAR 4 PO	NORTEL	NT56162008	15	0	0	£18.45
0007804110	CONN COAX BNC GREENPAR 50R	MARS DEFAU	GE35070C10	17	0	0	£14.79
0080048804	CONN COAX SOLDER R161022	NTWKOSLN	R161022	11	0	0	£16.94
0007804680	CONN COAX SOLDER GREENPAR GE37570C25	MARS DEFAU	GE37570C25	17	0	0	£17.51
0007824903	CONN D TYPE SHELL-9WAY	NORTEL	NT03652010	27	0	0	£25.38
0007824904	CONN D TYPE SHIELDED SHELL	NORTEL	NT03652012	36	0	0	£33.84
0007723634	CONN EDGE CDC 44671478	LPTR PBS 7	44671478	8	0	0	£7.04
0007726236	CONN EDGE 003WAY AMP 87233-3	LPTR PBS 7	44672520	3	0	0	£4.86
0080047870	CONN EDGE 005WAY X 2	MARS DEFAU	80047870	4	0	0	£2.00
0007733329	CONN EDGE 010WAY	ME29	7733329	10	0	0	£15.20
0080047874	CONN EDGE 013WAY X 2	MARS DEFAU	80047874	2	0	0	£1.04
0080047873	CONN EDGE 017WAY X 2	MARS DEFAU	80047873	1	0	0	£0.65
0080049161	CONN EDGE 020WAY	OPD WSTNUK	FF-20-001(DDK)	5	0	0	£0.85
0080047072	CONN EDGE 025WAY X 2	ME29	80047072	32	0	0	£100.16
0080049413	CONN FIXED 2X5WAY	MARS DEFAU	609-1027	112	0	0	£112.00
0080049296	CONN FREE 002WAY	OPD WSTNUK	22-01-2025	23	0	0	£0.46
0080047868	CONN FREE 017WAY X 2	MARS DEFAU	IDS-C34PK-SR-TR	3	0	0	£1.77
0080027750	CONN HEADER 6WAY USE WITH FEMALE CONTACTS	MARS DEFAU	80027750	2	0	0	£0.06
0080049421	CONN HEADER 004WAY	OPD WSTNUK	M20/3564SEBN	5	0	0	£0.65
0080049422	CONN HEADER 005WAY	OPD WSTNUK	2S?3565?D	14	0	0	£0.98
0080049579	CONN HEADER 007WAY	OPD WSTNUK	80049579	10	0	0	£1.30
0007804112	CONN HEADER 015WAY SIL MOLEX 3022	MARS DEFAU	22-03-1151	1	0	0	£0.66
0007725974	CONN HEADER 026WAY CPI 95433301	LPTR PBS 3	95433301	1	0	0	£3.80
0007724372	CONN HEADER 032WAY	MARS DEFAU	041-0035320157	38	0	0	£107.92
0080048859	CONN HEADER 036WAY 0.1IN PITCH SINGLE ROW	NTWKNPS	80048859	6	0	0	£5.04
0007753372	CONN HEADER 050WAY PCB	MTU	AS/002587/00	13	0	0	£47.19
0007814501	CONN HEADER 050WAY STRAIGHT PIN SHROUDED	MARS DEFAU	145-023	7	0	0	£28.56
0080049561	CONN HEADER 1X24WAY	OPD WSTNUK	80049561	1	0	0	£0.37
4000887000	CONN JUMPER 2WAY FOR TERM BLK	MARS DEFAU	673525	191	0	0	£13.37
0080047585	CONN JUMPER 7WAY USE WITH TERM BLK	ME29	80047585	7	0	0	£6.30
0080047170	CONN KEY POLARISING USE WITH 3M IDC CARD EDGE	MARS DEFAU	80047170	3	0	0	£0.06
0007757245	CONN PD50A2XO 50WAY	OFFPTR ML2	224A1160P0500	7	0	0	£19.11
0005040929	CONN PIN GUIDE MS14PB6S	MARS DEFAU	5040929	2	0	0	£0.42
0007758218	CONN PIN 036WAY BERG 75160-101-3 SIL	NTWKNPS	75160-101-3	8	0	0	£7.52
0007750051	CONN PLG 8WAY L654/P	MARS DEFAU	L654-P	3	0	0	£18.96
0080070077	CONN PLG 96WAY 90DEGREE 3X32 DIN	NTWKNPS	80070077	7	0	0	£5.88
4900124601	CONN PLG 003WAY	MARS DEFAU	041-9001246-00	30	0	0	£45.60
0007752642	CONN PLG 003WAY	OPD COL50H	KP0024A03	3	0	0	£3.21
4901290703	CONN PLG 004WAY	MARS DEFAU	4901290703	20	1	19	£3.00

0080047059	CONN PLG 009WAY FREE	MARS DEFAU	SE212/2279-L2.3NAT	5	5	0	£0.35
0007733328	CONN PLG 010WAY	ME29	A-10-109097	2	2	0	£1.88
0080049163	CONN PLG 015WAY	OPD WSTNUK	073745R	5	5	0	£10.85
0080047106	CONN PULL TAB 10/14WAY IDC	MARS DEFAU	80047106	3	3	0	£0.21
0080047104	CONN PULL TAB 40WAY IDC	MARS DEFAU	80047104	59	59	0	£5.90
0080047103	CONN PULL TAB 50WAY IDC	MARS DEFAU	80047103	6	6	0	£0.72
4902585801	CONN RECPT	MARS DEFAU	677460	6	6	0	£0.42
0080027744	CONN RECPT 3WAY USE WITH FEMALE LEAF CON.	MARS DEFAU	80027744	39	39	0	£1.17
0080009826	CONN RECPT 6WAY AMP 1-480705-0	NTWKPNPS	80009826	39	39	0	£3.51
0080007571	CONN RECPT 002WAY AMP 180908	MARS DEFAU	180908	557	557	0	£27.85
0080027477	CONN RECPT 050WAY AMP 205211-1	MARS DEFAU	80027477	15	15	0	£6.30
4900912802	CONN RECPT 2X7WAY 0.025SQ	ME29	673606	12	12	0	£19.92
4000205005	CONN RECPT COAX	ME29	673521	50	50	0	£62.50
0080047144	CONN RECPT 015WAY D TYPE	ME29	80047144	12	12	0	£3.60
4901057100	CONN SKT	MARS DEFAU	4901057100	6	6	0	£4.02
0007759000	CONN SKT R/A HIGHLAND 31-941-0	NTWKPNPS	31-941-0	3	3	0	£6.03
0080047447	CONN SKT 3WAY 5684	MTU	5684 HARVEY HUBBLE	1	1	0	£8.21
0007804037	CONN SKT 028PIN IC DILIC	MARS DEFAU	7804037	11	11	0	£1.54
0007758217	CONN SKT 002WAY BERG 76264-101 SIL	NTWKPNPS	76264-101	3	3	0	£1.08
0080009737	CONN SKT 003WAY 13A WHITE	MARS DEFAU	80009737	10	10	0	£13.70
0007727876	CONN SKT 003WAY MAINS	OFFPTR LX1	7727876	7	7	0	£169.33
0007732032	CONN SKT 009WAY	KEY EDIT	09-50-3091	271	271	0	£40.65
0080049562	CONN SKT 014WAY	OPD WSTNUK	80049562	1	1	0	£0.19
0007713135	CONN SKT 016WAY IC CCI91670	KEY EDIT	TEXAS C821650	2	2	0	£1.68
0007724674	CONN SKT 018WAY IC	MARS DEFAU	041-001833-052	1	1	0	£0.53
0007753377	CONN SKT 024PIN IC DILIC	MTU	BS/003565/00	1	0	1	£1.29
0007752029	CONN SKT 028WAY IC	OFFPRINTER	11040319	2	2	0	£8.34
0007803534	CONN SKT 040PIN IC DILIC TURNED	MARS DEFAU	7803534	78	78	0	£43.68
0080070255	CONN SKT CRIMP FOR USE ON D CONECTORS	MARS DEFAU	80070255	178	178	0	£10.68
0080048759	CONN SKT CRIMP MOLEX 08-56-0106	ME29	80048759	10	10	0	£2.70
0007758333	CONN SKT LID FOR 7758332	NTWKPNPS	004010R	1	1	0	£0.17
0007820803	CONN SOCKET	NORTEL	NT56150392	25	25	0	£5.00
00L0754269	CONN TERMINAL STRIP (ICL754269)	ME29	L0754269	11	11	0	£2.97
0007757246	CONN ZC-014 14WAY	OFFPTR ML2	224A3590P0140	7	7	0	£3.22
0007768870	CONNECTOR BOARD	MARS DEFAU	AC39004	3	1	2	£325.83
0080047502	CONNECTOR D TYPE 15 WAY MALE RT ANGLE	ME29	80047502	6	6	0	£16.08
0007755795	CONNECTOR E1	OFFPTR ML8	LP-5524-4	8	8	0	£0.64
7213130100	CONNECTOR PLUG W/O CONTACT	MARS DEFAU	7213130100	49	49	0	£25.48
0007821117	CONNECTOR RIBBON BACKPLANE	NORTEL	NT10500109	3	3	0	£6.36
0080070245	CONNECTOR WAS 80027478 & 80047860	ME29	80070245	112	112	0	£22.40
0007830392	CONNECTORS B00206/00	LPTR PBS 3	44672665	38	38	0	£106.40

Disp3

0007732251	CONN	350212-1	PC1 MOD 10	10096	7	0	£21.35
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CONN

0007731882	CONN	WITH WIRES		POS TERMIN	C901603000	1	1	0	£11.98
0080049233	CONN	025WAY D SKT		PWS BASEUN	80049233	2	2	0	£2.76
0080049886	CONN	004WAY A74067		PC	80049886	3	3	0	£0.93
0080049307	CONN	2 WAY		POS OST	80049307	5	5	0	£0.65
0080070571	CONN D	SOCKET SCREWLOCK 10MM LG		PWS BASEUN	D20418-210	2	2	0	£0.40
0080070228	CONN EDGE	2X31 & 2X18 WAY		PWS BASEUN	80070228	9	9	0	£6.30
0080070227	CONN EDGE	2X31 WAY		PWS BASEUN	80070227	11	11	0	£5.06
0080070635	CONN FEMALE	CRIMP		POS 9500	80070635	653	653	0	£78.36
0080070634	CONN FREE	PLUG HOUSING		POS 9500	MPL-04	103	103	0	£6.18
0007758251	CONN GUIDE			POS SCANNE	D860-9030-W785	11	11	0	£16.50
4003532090	CONN HDR	2X10WAY AMP 1-87227-0		PC HDA10M	4003532090	9	9	0	£11.07
0007758321	CONN HDR	2X8WAY AMP 87227-8 ICL 4003532074		PC2 HDA20M	87227-8	12	12	0	£12.00
0007733773	CONN HEADER	002WAY		PC1 MOD 30	HEADER 350209-1	1	1	0	£0.08
0007733774	CONN HEADER	004WAY		PC1 MOD 30	350211-1	5	5	0	£0.70
0080047835	CONN HEADER	006WAY AMP641986-1		PC2 MODEL1	675152	264	264	0	£76.56
0007760037	CONN HEADER	05 WAY MALE PIN		PCTPDISCLE	20.60010.105	5	5	0	£2.50
0007760038	CONN HEADER	12 WAY MALE PIN		PCTPDISCLE	20.60024.112	9	9	0	£2.43
0080071633	CONN HEADER	1X6WAY		PCTPM95-00	80071633	5	5	0	£2.25
0080048166	CONN HEADER	2X30WAY		PC2 MODEL	80048166	3	3	0	£3.30
0080037971	CONN HEADER	ST. PINS 2X10 WAY		PWSCOMMS23	80037971	1	1	0	£0.23
0080049771	CONN HEADER	STRAIGHT 1X3WAY		PWS BASEUN	80049771	1	1	0	£0.05
0080049772	CONN HEADER	STRAIGHT 1X5WAY		PCTPM95-00	80049772	17	17	0	£8.84
0080048773	CONN HEADER	STRAIGHT 2X17WAY		PCTPM95-00	80048773	17	17	0	£6.63
0080071635	CONN HEADER	STRAIGHT 2X8WAY		PCTPM95-00	80071635	15	15	0	£5.55
4001699057	CONN PIN	CRIMP AMP 61314-1		POS OST	4001699057	12	12	0	£0.12
4901856904	CONN PLG	026WAY RJANGLED		POS CONTR	3429-5202	19	19	0	£25.65
0005402680	CONN PLUG	20WAY PIN 8 REMOVED		PWS BASEUN	5402680	1	1	0	£0.64
0080070076	CONN RECP	3X32WAY		PWS BASEUN	80070076	8	8	0	£13.52
0080049057	CONN SHORTING	LINK		PC QUATTRO	80049057	126	126	0	£152.46
4900701801	CONN SKT			POS	041-9007018-01	4	4	0	£5.04
0007738707	CONN SKT	VIDEO I/F		PERQ 2	820016-06	7	7	0	£2.24
0007758134	CONN SKT	002WAY TANDBERG MOTOR REV LOW.		PERQ	402882	4	4	0	£3.72
0007758135	CONN SKT	003WAY TANDBERG MOTOR REV 3 HI		PERQ	406344	4	4	0	£3.72
4901733203	CONN SKT	024WAY IC		POS CONTR	4901733203	13	13	0	£1.82
4901733202	CONN SKT	028WAY IC		POS CONTR	4901733202	107	107	0	£17.12
0080070119	CONN SKT	HEADER 1X 12PIN		PWS BASEUN	8619-1247	2	2	0	£1.68
0080070216	CONN SKT	HEADER 1X 4PIN		PWS BASEUN	22-04-2041	2	2	0	£0.34
0080070218	CONN SKT	HEADER 1X 7PIN		PWS BASEUN	22-04-2071	2	2	0	£0.40
0007760705	CONN SKT	ICP DIP 24P D15.24MM		PCTPM95-00	22-10002-024	4	4	0	£0.28
0080070198	CONN SKT	ROUND 9PIN		PWS BASEUN	TCS 7913-01-201	1	1	0	£0.44
0080047629	CONNECTOR			POS OST	80047629	18	18	0	£1.26
0007768021	CONNECTOR	(CN11)		PCNB NOTEB	DEFC20FS027	498	498	0	£239.04
0007764430	CONNECTOR	BOARD EXTERNAL 5.25" FDD		PCSCSPRING	AA40473	33	29	4	£437.58
0007768815	CONNECTOR	COAX SINGLE BALUN		POSIBM	DP10	1	1	0	£19.14

CONN

0007764264	CONNECTOR EXTERNAL FDD DEVICE	PCSCSPRING	A9400706	18	17	1	£102.96
0007928556	CONNECTOR PANEL ASSY	PCNDNOKIAC	470-000152-100	4	4	0	£1,441.84

Disp4

0007739802	CONN 2ND ANODE	S25 M84 VI	42-25298B09	21	21	0	£50.61
0007727969	CONN 006WAY	S25	28-10586A19	10	10	0	£15.70
0080047791	CONN BLOCK 003WAY	S25 PLU	80047791	23	23	0	£10.58
0080047442	CONN D LH BRKT	S39 L80	80047442	948	948	0	£47.40
0080037972	CONN EDGE 020WAY X 2	S25/2 PROC	80037972	4	4	0	£1.76
0005073320	CONN EDGE 020WAY X 2	SERVICE AI	5073320	14	14	0	£30.24
0007703754	CONN EDGE 062WAY CDC 94243401	SERVICE AI	7703754	2	1	1	£14.52
0080047777	CONN FIXED 017WAY X 2	S25	80047777	3	3	0	£1.47
0080048877	CONN FIXED 2X13 WAY	S25 CP/DUA	80048877	19	19	0	£17.10
0080049411	CONN FIXED 2X8 WAY	S25 CP/DUA	80049411	19	19	0	£13.49
0080070024	CONN FREE 2WAY	S39 L30	80070024	28	28	0	£0.84
4901691501	CONN HEADER 008WAY	S25	4901691501	15	15	0	£12.45
0080048879	CONN HEADER 2 X 25WAY 609-5017 IDC R/A PCB MTG	S25	80048879	2	2	0	£1.62
0080048162	CONN HEADER 2X7WAY 609-1417ES IDC R/A L/EJECT	S25/2 PROC	80048162	5	5	0	£2.40
0080048054	CONN HEADER ST. PINS 2X1 WAY	S25	80048054	38	38	0	£0.76
0007740626	CONN INTRA 034PIN SET OF 2	SERVICE AI	922576-34	3	3	0	£46.98
0007740627	CONN INTRA 050PIN	SERVICE AI	922576-50	1	1	0	£25.81
0080049761	CONN PIN 0.025IN SQUARE	S25 U CTLR	80049761	4	4	0	£0.36
0007718391	CONN PLG 4MM BLACK	SERVICE AI	444-179	9	9	0	£16.83
0007718390	CONN PLG 4MM RED	SERVICE AI	444-208	1	1	0	£0.14
4901290701	CONN PLG 002WAY	SERVICE AI	4901290701	277	277	0	£44.32
0007719811	CONN PLG 003WAY	S10	AXR-3-11	1	0	1	£3.03
0007719810	CONN PLG 003WAY 1010 WW	S10	002204X	22	22	0	£24.20
0027440742	CONN PLG 015WAY 5A	SERVICE AI	06285X	19	19	0	£9.88
4901290708	CONN PLG 016WAY	SERVICE AI	641990-1	5	5	0	£3.95
0007718406	CONN SKT RS 423-201 BLACK	SERVICE AI	423-201	1	1	0	£0.32
0080047020	CONN SKT 016WAY IC	S25	80047020	8	8	0	£0.48
0007723394	CONN SKT 018WAY IC	SERVICE AI	7723394	6	6	0	£0.48
0007723419	CONN SKT 024WAY IC	SERVICE AI	0003115	16	16	0	£3.52
0007734106	CONN SKT 025WAY NBY-25S-2	SERVICE AI	NBY-25S-2 (DB-25S)	5	5	0	£7.10
0080047024	CONN SKT 040WAY DIL LOW PROFLE	S25/2 PROC	80047024	7	7	0	£0.98
4002324002	CONN WIRE WRAP POST 0.025IN SQ	S25	4002324002	2	2	0	£0.14
0007769561	CONNECTOR 7 PIN	SPECTRETAIL	151-331	73	73	0	£182.50
0007769552	CONNECTOR BLACK 8 PIN TDL	SPECTRETAIL	151-332	13	13	0	£26.00
0007769696	CONNECTOR DIGIBOARD	SPECTRETAIL	DGBRJ-45	6	2	4	£480.00
0007768949	CONNECTOR HOOD FOR MUX CABLE FOR BFL	SPECTRETAIL	RC113008	2	2	0	£9.28
0007769353	CONNECTOR TERMINAL BLOCK 3 WAY KBD1/3KR	SPECTRETAIL	151800	1	1	0	£2.29

CRT

Part No	Description	Supplier	QTY	Unit Price	Total Price
4901863803	BAR CRT FRICTION	D20V M6 VD	676339	11	0
0007764802	CABLE ASSY LED	727021	28	0	£363.16
0005516278	CABLE LED PANEL	5516278	4	0	£12.44
0007942994	CRT (AMBER-ON-BROWN)	E341006022	5	0	£108.80
0007770738	CRT 10" COLOUR FOR LANDMARK	7770738	3	2	£2,355.96
0080050074	CRT 12" DIRECT ETCH	M31-364GHED	4	0	£131.76
0080060415	CRT 12" LID	CE758W12K42GR	1	0	£59.99
0080048023	CRT 12" SPECIAL COATING	CE758W12P31GHICM	7	0	£1,418.20
0080007219	CRT 15" GREEN M38-122GH-R	80007219	35	4	£2,476.95
0007935897	CRT 15. (PAINT. AMBER ON BRW)	7935897	228	0	£7,227.60
0007945454	CRT 15. COLUR	NMO849	6	0	£707.46
0080061953	CRT 9" ASSY	17233/001	5	0	£527.80
0080213368	CRT 9" VGA MONO FOR POS TERMINAL	58312/001	1	0	£93.96
0007730642	CRT ASSY	7730642	24	4	£13,068.96
4901893403	CRT ASSY ELSTON	4901893403	64	0	£15,953.92
7014440000	CRT ASSY MONO CIT-101E MODEL 1160	002-014440-000	3	1	£1,278.69
0080060985	CRT ASSY WITH RC ISOLATION (ELSTON)	80060985	41	2	£13,325.82
0007764936	CRT COLOUR	B49L-0270-O301A/S1/N-T	4	4	£1,993.00
0007763733	CRT COLOUR ASSY	B06B-9240-C827A	5	1	£3,536.60
0007764900	CRT COLOUR ASSY	B06B-9240-C845A	11	0	£15,224.44
0007759712	CRT M37108X N1130	7759712	1	0	£109.41
0007768981	CRT MONO MOP 9"	CA50100-0100	1	1	£167.06
0007929118	CRT NT-0904XU	7929118	12	12	£3,745.08
0007961365	CRT VIT	50814/095	7	0	£3,953.53
0007940094	CRTC (TTL)	50814/258	11	11	£937.42
0007940095	CRTC 186B (TTL)	50814/263	156	1	£11,966.76
0028750252	CRYSTAL 002 0000 MHZ CS217	CS217/2.000	1	0	£2.05
4901275256	CRYSTAL 004.0000 MHZ	95352000	2	0	£5.60
0005101229	CRYSTAL 009.8304 MHZ CS155	017988X	2	0	£3.32
0007752381	CRYSTAL 015 0000 MHZ	7752381	5	0	£19.00
0080048475	CRYSTAL 015 9740 MHZ	80048475	40	0	£16.80
0005108151	CRYSTAL 019.0480 MHZ CS217	5108151	18	0	£16.20
4901859008	CRYSTAL 020.0000 MHZ	9018590-08	4	0	£0.08
0007756271	CRYSTAL 033 3300 MHZ	NCT070C-33	13	0	£33.67
0007961308	CRYSTAL 12MHZ	50814/325	7	0	£5.74
0007949118	CRYSTAL 18.8696MH	A4353188	8	0	£5.92
0007938996	CRYSTAL 24 0000MHZ 50PPM SMD	A4509648	1	0	£0.76
7002160001	CRYSTAL 3 579 MHZ	020-002160-001	5	0	£3.15
7008980002	CRYSTAL 400MHZ	020-008980-002	6	0	£0.36
0007947107	CRYSTAL OSC 38 0000MHZ	RTL201301/29	18	0	£46.80
0080053668	CRYSTAL QUARTZ 12MHZ	80053668	5	0	£1.60
0007739079	DISPLAY 16 IN	9640-0049	3	2	£61.26
0007723762	DISPLAY 240 CHAR SELF SCAN 2	7723762	13	1	£4,746.43
7014538012	DISPLAY ASSY CUSTOMER M2100	049-014538-012	23	13	£298.77
7018778001	DISPLAY ASSY OPERATOR SCALE	003-018778-001	41	7	£7,995.41
7007730001	DISPLAY ASSY WITH TUBE & BASE	003-007730-001	119	23	£15,232.00

7018898000	DISPLAY MOUNTED ON POLE WITH BASE FOR M500	DATA CHECK	040-018898-000	1	1	0	£46 77
0080203350	DISPLAY ON POLE	9530	AH025EA	64	61	3	£8,530 56
0007750495	DISPLAY PLASMA AND DRIVER PCB OKIDATA	FDC	RA4006C2-M	158	25	133	£105,386 00
0007961666	DISPLAY PROCESS BOARD DPG E17	50814/036	7961666	25	24	1	£14,504.25
0080061956	DISPLAY REMOTE CUSTOMER FOR 9520A	9520/200	17857/001	1	0	1	£183.28
0007925184	DISPLAY TM3000	50814/323	2566939-0001	7	1	6	£4,086.81
0007961513	DISPLAY UNIT	50814/009	7961513	1	1	0	£162.36
0007961659	DISPLAY UNIT 1025/CDU14AS	50814/062	KDN12705/9	1	0	1	£190.56
0007961366	DISPLAY UNIT CRU	50814/095	7961366	5	0	5	£552 85
0007940294	DISPLAY UNIT DU972W	50814/080	AC42020.1	13	13	0	£5,348.07
0007765513	LCD NB3861		1LD2ZZ1C11	2	0	2	£423 54
0007961131	MONITOR	50814/083	8515	3	0	3	£1,862 67
0080060189	MONITOR 14" 25KHZ	D2V MOD 30	80060189	23	0	23	£21,957 64
0086018286	MONITOR 14IN 25KHZ TOSHIBA UL/CSA APPROVED	D3V PV5	86018286	13	9	4	£5,237.05
0007925527	MONITOR 19	50814/296	365-1140	3	0	3	£4,010 34
7000000027	MONITOR 3000 SERIES	DATA CHECKE	7000000027	30	3	27	£9,674 40
7000000013	MONITOR AMBER	DATA CHECKE	7000000013	2	1	1	£274.46
0085076711	MONITOR ASSY FOR 051003/01	2900	85076711	8	6	2	£6,086 48
0007961130	MONITOR COLOUR	50814/079	8513-102	2	0	2	£425.20
0080061796	MONITOR COLOUR WYSE 370 DNA	DATA CHECKE	80061796	1	0	1	£662.02
0086018540	MONITOR DIFFERENTIAL KIT	D3V PV2	86018540	39	36	3	£678.99
0007961605	MONITOR DU151 ALFA (VER D)	50814/076	AC42000 1RD	56	48	8	£9,257 36
0007961459	MONITOR MAINBOARD VE17C	51278/047	SMA103	15	14	1	£2,711.70
0007763911	MONITOR MONO MAINTENANCE	ATM	D86L-9008-0076/A2	3	3	0	£325 83
0007961497	MONITOR P-SUPPLY 99-019	57321/015	990019/05	4	1	3	£516 84
0007961653	MONITOR PCB FACIT 3400	57321/115	ROA11966202	1	0	1	£110.92
0007961467	MONITOR UNIT NCD16	50814/084	SU6E	1	1	0	£887.09
0007962496	MONITOR VE17C	50814/255	AF63090	1	1	0	£642.52
0007961854	MONITOR/PSU FACIT 1620	57321/080	55500228-00	15	13	2	£1,260.15
7014538123	TUBE DISPLAY ZL1213RG78	DATA CHECKE	049-014538-123	6	0	6	£86.22
7014190118	TUBE DISPLAY ZLFG913B78	DATA CHECKE	049-014190-118	33	16	17	£178 53
0007756684	UNIT DISPLAY	9518/200	D16L-9349-0096	114	0	114	£12,430.56
4902216901	VDU + KBRD 003116/02	D20F M16VD	4902216901	6	4	2	£4,071 60
0007961272	VDU 220 COMPLETE	50814/255	ALVA12	2	0	2	£428.90
0007819251	VDU AMPEX 280 FOR COVO ONLY	D40V MOD28	AMPEX E280	66	4	62	£52,452 84
0007961186	VDU CONTROLLER E19	50814/255		9	8	1	£1,010 16
0007759232	VDU DRS 8801 007101/01 WHOLE UNIT	DRS 8801	007101/01	72	21	51	£40,590.72
0007754655	YOKE ASSY CRT	D3V PV2	7754655	1	0	1	£326.36

Disp2

0007768691	BEZEL LCD	MARS DEFAU	41 42103.111	4	4	0	£22.96
000773696	BEZEL LCD	MARS DEFAU	41 46203.01	22	22	0	£49.50
0007757725	CRT 14IN COLOUR FOR 008673/01	OPD COL14D	37JGA67X-TC01	1	1	0	£164.00
0007823339	CRYSTAL	NORTEL	NT891274-1	2	2	0	£7.72
0007823335	CRYSTAL	NORTEL	NT891258-1	2	2	0	£26.28
0007823363	CRYSTAL	NORTEL	NT77221260	7	7	0	£40.04
0007823364	CRYSTAL	NORTEL	NT77221268	8	8	0	£49.84

CRT

0007823347	CRYSTAL	NORTEL	NT891313-1	7	7	0	£121.94
0007823362	CRYSTAL	NORTEL	NT77221250	7	7	0	£101.57
0007823322	CRYSTAL	NORTEL	NT891138-9	7	7	0	£17.43
0007824743	CRYSTAL	NORTEL	NT77221153	2	2	0	£4.44
0007823365	CRYSTAL 4 623 0 KHZ	NORTEL	NT77221273	2	2	0	£8.26
0007823219	CRYSTAL 891138-	NORTEL	NTSYC05114	7	7	0	£38.22
0007823203	CRYSTAL 891138-12	NORTEL	NTSYC05059	2	2	0	£2.36
0007823232	CRYSTAL 891138-15	NORTEL	NTSYC06035	3	3	0	£9.18
0007823218	CRYSTAL 891138-15	NORTEL	NTSYC05111	4	4	0	£10.24
0007823234	CRYSTAL 891138-16	NORTEL	NTSYC05112	7	7	0	£18.34
0080050254	CRYSTAL 003.5795 MHZ	OPD WSTNUK	GB03C3 579545MHZQC18	11	11	0	£24.20
0007759042	CRYSTAL 004 0000 MHZ	NTWKPNPS	GB03S4MHZQC49/A	5	5	0	£1.90
0007814309	CRYSTAL 004 0000 MHZ 4PIN	MARS DEFAU	7814309	5	5	0	£40.55
0007759010	CRYSTAL 004.0960 MHZ	NTWKPNPS	JE03EQC49/A4 096MHZ	5	5	0	£25.00
0007731951	CRYSTAL 006 0000 MHZ	MTU MTS470	7731951	12	12	0	£20.40
0007814371	CRYSTAL 006.0000 MHZ 2PIN CAN STYLE HC18/V	MARS DEFAU	103-884	17	17	0	£29.75
0007756978	CRYSTAL 010.0000 MHZ	OFFPTR ML1	LP-12186-2	6	6	0	£3.36
0080047138	CRYSTAL 012 0000 MHZ CS217	ME29	80047138	4	4	0	£3.60
0007752027	CRYSTAL 012.2880 MHZ TD308A	OFFPRINTER	15030073	3	3	0	£38.28
0007758214	CRYSTAL 016.0000 MHZ 2PIN CQ45 CAN 20PF	NTWKPNPS	GB03C16MHZQC45	93	93	0	£264.12
0080047599	CRYSTAL 018 4320 MHZ CS217	MARS DEFAU	80047599	12	12	0	£10.80
0080037404	CRYSTAL 020 0000 MHZ CS217	LPTR	80037404	3	3	0	£2.85
0007758215	CRYSTAL 020 0000 MHZ 2PIN CQ45 CAN 20PF	NTWKPNPS	GB03C20MHZQC45	17	17	0	£19.89
0007823968	CRYSTAL 25MHZ	NORTEL	NTSYC05129	2	2	0	£3.44
0007823366	CRYSTAL 4000 KHZ	NORTEL	NT77224020	1	1	0	£2.91
0007823367	CRYSTAL 891313-10	NORTEL	NT77227060	1	1	0	£11.77
0007822630	CRYSTAL 8MHZ	NORTEL	NT891138-1	7	7	0	£8.68
0007824454	CRYSTAL OSC	NORTEL	NT04820000	3	3	0	£69.63
0007729607	LAMP INDICATOR PANEL DISPLAY	MTU GTS 47	401206302	123	108	15	£312.42
0007767815	LCD 640 X 480	MARS DEFAU	AA064P83008	19	14	5	£2,228.70
0007767816	LCD COVER	MARS DEFAU	EA0LS401205	11	11	0	£61.27
0007767280	LCD LM64C082 SHARP	MARS DEFAU	56.07474 011	16	0	16	£10,597.44
0007767558	LCD LM64P83 SHARP	MARS DEFAU	56 07472 002	2	0	2	£385.58
0007757093	LCD UNIT	OFFPTR P44	PJAD112Z	4	3	1	£77.92
0007768324	LCM DISPLAY (SANYO) LM-CA53-22NDIL	MARS DEFAU	56 07479 001	1	0	1	£508.66
0007771852	MONITOR 14 INCH MONO VGA DISPLAY AST	MARS DEFAU	500782-002	3	1	2	£1,500.00
0007770831	MONITOR 14" 411 MONO COMPAQ	MARS DEFAU	411MONO	2	0	2	£116.00
0143800502	MONITOR 14" SVGA COMPAQ	MARS DEFAU	143800-502	3	0	3	£817.80
0007772170	MONITOR 15L SVGA AST RANGE	MARS DEFAU	501324-006	4	1	3	£1,740.00
0007771851	MONITOR 17 INCH SVGA CLR AST	MARS DEFAU	AST500903-002	1	0	1	£500.00
0007771857	MONITOR 17" MSCN DELL	MARS DEFAU	44986	4	2	2	£2,000.00
0007770057	MONITOR 5153-002 COLOUR IBM	MARS DEFAU	IBM5153	12	0	12	£696.00
0007936885	MONITOR 8503 PS/2 MONO	MARS DEFAU	8503	1	1	0	£58.00
0007771554	MONITOR 9518 IBM	MARS DEFAU	IBM9518	1	0	1	£0.01
0007819502	MONITOR ADM42 4300/00	MODMIAL	129842	1	0	1	£208.80
0005400209	MONITOR ASSY MONOCHROME	OPD WSTNUK	5400209	23	0	23	£2,333.81
0007820190	MONITOR COLOUR EUROPE	NORTEL	NT30700011	6	2	4	£2,268.96

CRT

	MONITOR COLOUR SCREEN (CGA) IBM	MARS DEFAU	IBM0043	6	5	1	£900 00
0007770000	MONITOR DELL VC10 CEN	MARS DEFAU	34105	5	0	5	£1,131.00
0007769754	MONITOR e212 21" DDC,DPMS,MPR11 N.H	MARS DEFAU	PD40E193	3	3	0	£3,069.36
0007776992	MONITOR IBM 8503-002	MARS DEFAU	8503-002	8	0	8	£2,000.00
0007770475	MONITOR LYNWOOD J100	MARS DEFAU	LYDJ100	10	8	2	£1,750.00
0007766725	MONITOR MONOCHROME BUSTERISED M5/1 (G ON B)	OSDVMONOVD	7766725	20	9	11	£2,923.20
0007766726	MONITOR MONOCHROME BUSTERISED M5/2(W ON B)	OSDVMONO5/	7766726	28	16	12	£4,612.16
0007820201	MONITOR NT MDU15A (V1241)	NORTEL	NPL62630 (MDU15A)	4	3	1	£1,401.24
0007771847	MONITOR PREMIUM DISPLAY SVGA AST	MARS DEFAU	AST500783-002	2	0	2	£1,000.00
0007769752	MONITOR SVGA ULTRA SCAN	MARS DEFAU	VC5EN	18	0	18	£3,654.00
0007770020	MONITOR VISA LINK 220	MARS DEFAU	VSA220VDU	54	54	0	£16,051.50
0007776998	MONITOR x173 17" DPMS,DDC,TCO N.H. ICL	MARS DEFAU	PD39E1E3	5	5	0	£2,546.20
0086009699	SCREEN	ME29	86009699	5	5	0	£25 00
0007770568	SCREEN EGA (LINWOOD)	MARS DEFAU	ELM640.350-D4	6	4	2	£6,007.98
0005091256	SCREEN GREEN	MARS DEFAU	31 901	2	2	0	£0.60
0005091258	SCREEN GREY	MARS DEFAU	31/901 8	4	4	0	£1 28
0007820732	SCREEN REAR	NORTEL	028331	2	2	0	£17 02
0007739035	SCREEN SUPERSET	MARS DEFAU	MU192DB	3	0	3	£6,960 87
Disp3							
0007732577	VDU 8455 CW KBRD IN BLACK/BEIGE	NTWKNS	7732577	38	0	38	£47,229.06
0007766752	WHOLE UNIT M10 MONITOR (BUSERISED COLOURS)	OSDVM10TML	7766752	66	30	36	£23,657.04
0007920178	191E 15" BW MONITOR LNF LT GREY	PCNDNOKIAC	ALUA40	3	3	0	£110.67
0007920180	191ES 15" BW MONITOR LNF DK GREY	PCNDNOKIAC	ALUB10	2	1	1	£65 72
0007760183	CRYSTAL 001.8432 MHZ 32P 50PPM 2 PIN RADIAL	PCTPM40BAS	23.30006 011	3	3	0	£3 00
0080050913	CRYSTAL 001 8432MHZ	PWS BASEUN	80050913	1	1	0	£0.85
4901802402	CRYSTAL 005.9904 MHZ	POS TERMIN	4901802402	5	5	0	£10 90
0007731681	CRYSTAL 006.1440 MHZ	POS TERMIN	XBR1A1002X	15	15	0	£41.70
0080048038	CRYSTAL 008 0000 MHZ	PERQ 1	80048038	1	1	0	£1.00
0007756432	CRYSTAL 009.216 MHZ TYPE HC49U	POS9516	73163R	5	5	0	£6.80
0007760184	CRYSTAL 009.6 MHZ 2 PIN RADIAL	PCTPM40BAS	23.30014.011	3	3	0	£3.00
0080051033	CRYSTAL 012.0000 MHZ	PWS BASEUN	GB03S12MHZQC18INSULATD	5	5	0	£3.35
0080051090	CRYSTAL 014 3180MHZ	PWS BASEUN	A153A	2	2	0	£0.56
0007760182	CRYSTAL 014.31818MHZ 32P 30PPM 2 PIN RADIAL	PCTPM40BAS	23 30001.007	3	3	0	£1.62
0007758310	CRYSTAL 016 0000MHZ CY16B16MHZ HC18U CRYSTEK	PC HDA10M	CY16B16MHZ	5	5	0	£10.00
4901395805	CRYSTAL 018 4320 MHZ	POS TERMIN	A146B	8	8	0	£5.20
0007739546	CRYSTAL 060 0000 MHZ	PERQ 2	7739546	14	14	0	£17.64
0007760043	CRYSTAL 25 175MHZ DIL TCO-711A	PCTPDISCLE	24 30016.003	7	7	0	£9.03
0007760041	CRYSTAL 32 768KHZ 2 PIN RADIAL	PCTPDISCLE	23.30030 011	5	5	0	£10 00
0080050500	CRYSTAL CS445/10.00MHZ	PWS BASEUN	GB03E10MHZQC45	1	1	0	£0.67
0080054155	CRYSTAL OSC DUAL FREQ TTL	PCTPM95-00	80054155	6	6	0	£12.48
0080051120	CRYSTAL QUARTZ 1.8432MHZ CS217/1	PCTPM95-00	80051120	5	5	0	£5 40
4901897702	DISPLAY ASSY 22 DIGIT	POS TERMIN	673846	17	0	17	£6,916.79
0007732923	DISPLAY ASSY PLASMA	POS OST	7732923	10	3	7	£6,252.40
0007764783	DISPLAY COLOUR FLAT SCREEN 12" AE12C ICL	PCSCSPRING	PD012001	6	5	1	£8,901.84
0007765396	DISPLAY COLOUR VE17C TCO ICL	PSMVE17CLM	PD011029	10	4	6	£6,681.60
0007737164	DISPLAY CUSTOMER	POS TERMIN	D04B-5570-D40	1	0	1	£228.74

0007920221	DISPLAY FPS	PCNDNOKIAC	7920221	72	67	5	£1,611.36
0007737234	DISPLAY MODULE	POS TERMIN	7737237	3	0	3	£941.61
0007920241	DISPLAY UNIT 9514	PCNDNOKIAC	7920241	11	9	2	£629.09
0007920240	DISPLAY UNIT 9514-0111	PCNDNOKIAC	7920240	1	1	0	£57.19
0007920156	DISPLAY UNIT ADU15A (GREY)	PCNDNOKIAC	AF62660	3	3	0	£85.77
0007737059	DISPLAY UNIT FPC4-08NRUL	POS9516	7737059	1	1	0	£619.66
0007920404	DISPLAY UNIT VDU 471W	PCNDNOKIAC	AC42031.1	4	2	2	£2,431.68
0007768666	LCD ASSY	PS NOTEBK	AA064P10001	12	12	0	£1,971.60
0007765590	LCD ASSY COLOUR NB386LC	PCSCSPRING	1LD2ZZZ1C02	7	0	7	£9,714.32
0007764309	LCD DISPLAY	PCSCSPRING	A9400380	1	0	1	£19.72
0007763308	LCD DISPLAY UNIT	PCNB NOTEB	81329LCIC00	5	0	5	£1,162.45
0007768053	LCD INSULATOR	PCNB NOTEB	FC032800901	8	8	0	£4.24
0080177594	LCD MODULE ASSY	PCP M95-33	80177594	110	108	2	£2,552.00
0007768444	MONITOR 14" CALIBRA VSN	PS 486VL33	EM1448LR	10	4	6	£1,660.50
0080060258	MONITOR 14" COLOUR DUAL MODE NORTH HEMISPHERE	PWDUC14NHD	80060258	5	3	2	£2,087.55
0080060442	MONITOR 14" COLOUR SNGL MODE SOUTH HEMISPHERE	PWDUC14SHE	80060442	1	1	0	£382.80
0080060357	MONITOR 14" COLOUR SNGL/MODE NORTH HEMISPHERE	PWDUC14NHE	80060357	16	0	16	£6,291.84
0080061004	MONITOR 14IN VGA COLOUR 110V N/HEMISPHERE	PCTMMONC11	80061004	1	1	0	£208.80
0080061001	MONITOR 14IN VGA MONOCHROME 110V	PCTMMON110	80061001	4	2	2	£373.52
0007770934	MONITOR 3178 IBM	PS BQ1	IBM5894007	6	3	3	£139.20
0007770648	MONITOR 5151 IBM MONO (80XPC)	PS NEWBQ	IBM5151002	8	4	4	£371.20
0007950847	MONITOR A320E 15" BW ASYNC ANS/DEC	PCNDNOKIAC	AC42050 1	7	7	0	£3,500.00
0007950848	MONITOR A320G 15" BW ASYNC ANS/DEC	PCNDNOKIAC		1	0	1	£500.00
0080019760	MONITOR ASSY CHASSIS	PERQ 2	MC1514	1	0	1	£665.85
0007732926	MONITOR ASSY FOR 006403/01	POS OST	9420/01 OR 6403/01	3	1	2	£69.60
0007920158	MONITOR CDU14AS LMF (NIS)	PCNDNOKIAC	7920158	1	1	0	£57.19
0007920163	MONITOR CDU14AS/ECL	PCNDNOKIAC	AF63033	13	13	0	£806.78
0007766193	MONITOR COLOUR 17" VE17C TCO ALFASKOP	PS VDUVE17	PD011028	6	0	6	£5,877.60
0080178050	MONITOR COLOUR BE14C 230V	PSMVDU230V	91.71102.702	29	0	29	£4,390.31
0080178051	MONITOR COLOUR CLASSIC 110V	PSCLCLASSI	PD011031	21	19	2	£3,108.00
0007949059	MONITOR COLOUR VDU472C/MPRIII	PCNDNOKIAC	AF63113	8	2	6	£2,913.84
0007766410	MONITOR ERGO PRO 15" COL.VE15C N/H.P.S(D.GREY)	PS VDUVE15	PD105011	6	6	0	£1,551.72
0007766406	MONITOR ERGO PRO VE15C 15" COL. N/H.P.S(GREEN)	PS VDUVE15	PD102011	3	3	0	£775.86
0007768429	MONITOR ICL 14V 14" COLOUR - ACER 7133DL	PS SPRING9	PD231100	10	0	10	£1,856.00
0007764780	MONITOR MONOCHROME 15" DU151B 230V ICL	PCSCSPRING	PD010009	7	0	7	£1,867.60
0007770653	MONITOR SVGA M4-422	PS NEWBQ	SVGAMONITORM4	6	2	4	£1,650.00
0007920843	MONITOR TCO ASYNC ANS/DEC + A320E MPRII	PCNDNOKIAC		11	0	11	£8,250.00
0007920842	MONITOR TCO ASYNC ANS/DEC + A320E MPRII	PCNDNOKIAC		1	1	0	£750.00
0007920232	MONITOR UNIT 3715-002 DMU	PCNDNOKIAC	7920232	19	18	1	£15,216.34
0007920238	MONITOR UNIT DNU 9116-001	PCNDNOKIAC	7920238	2	0	2	£213.44
0007768203	MONITOR VE15C 15" COLOUR (GREEN CASE)	PS SPRING9	PD222011	2	1	1	£726.00
0007768921	MONITOR VE15M 15" MONO	PS SPRING9	TD010030	6	6	0	£1,517.28
0007767779	MONITOR VE17C 230V MPR S HEMIS. (LOW COST)	PS VE17CLC	PD19A051	4	4	0	£2,272.84
0007777001	MONITOR x173a 17" DPMS.DDC.TCO N H U.K	PS SPRING9		5	5	0	£2,639.00
0007920306	MONOCHROME HR GRAPHICS	PCNDNOKIAC	1070-001 R1A	23	15	8	£1,208.42
0007734631	PSU MONITOR	PCDUCTX410	7734631	1	0	1	£222.35
0007959936	TUBE BASE/CRT BOARD	PCNDNOKIAC	SMH079	2	2	0	£51.22

CRT

4901903801	TUBE DISPLAY 11-LT 23ZB	POS TERMIN	11-LT-23ZB	30	30	0	£451.50
0007731684	RETR DISPLAY 1ME4194	POS TERMIN	5MVB511SB001	45	45	0	£15.75
0007920242	VDU - 14" B-ON-W VDU LNF 191B	PCNDNOKIAC	7920242	8	3	5	£187.68
0007949246	VDU + LOG 472 C/I	PCNDNOKIAC	TD043122	1	1	0	£548.68
0007920832	VDU 15" COLOUR FOR IDEA TRM277C	PCNDNOKIAC	12277-02C	10	7	3	£5,278.00
0007734946	VDU LANDSCAPE	PERQ 2	7734946	3	1	2	£4,669.74
0007734942	VDU PORTRAIT	PERQ 2	111236-10	1	0	1	£2,537.35
0007759101	WHOLE UNIT F02384/12 DISPLAY	POS 9518	F02384/12	6	5	1	£1,606.62

Disp4

0007728512	CRT	SPECRETAIL	23510	7	7	0	£1,136.80
0007734437	CRT 310JLB42N FOR 003484/00	S25 M84 VI	310JLB42N	13	11	2	£754.00
0007727998	CRT 12" P42.PPG	S25	96/02501A 45	53	52	1	£3,613.54
4901893401	CRT ASSY WITH ANTI-GLARE SCREEN	S25	4901893401	28	0	28	£9,640.40
0007727118	CRYSTAL 005.9904 MHZ	S25	SD20216	10	10	0	£29.00
0080027712	CRYSTAL 010 0000 MHZ CS217	S25 APPPRO	80027712	8	8	0	£8.00
0080047826	CRYSTAL 010.1250 MHZ	S25 PLU	80047826	4	0	4	£3.60
0007767303	DISPLAY CUSTOMER	SPECRETAIL	DM-D202	2	2	0	£487.20
0007771432	DISPLAY FOR 2154 MIDLINE	SPECRETAIL	250-0019117	76	62	14	£9,500.00
0007771444	DISPLAY FOR MODEL 2155	SPECRETAIL	250-0019576	1	0	1	£135.00
0007771418	DISPLAY FOR NCR 2153	SPECRETAIL	008-0208402	31	29	2	£4,030.00
0007765933	LCD DISPLAY ASM	TMLNLCN72	011-00002-00	6	6	0	£869.16
0007765402	MONITOR COLOUR X190C 19" ICL	TMLX190BAS	TD190001	10	6	4	£9,663.10
0007769575	MONITOR FIDELITY LM14	SPECRETAIL	FIDCCM14	2	1	1	£1,000.00
0007765405	MONITOR MONO X192 19" ICL	TMLX192BAS	TD192001	5	2	3	£3,303.80
0007771475	VDU 14" GREEN SCREEN ADDS MODEL 2970	SPECRETAIL	2970-VDU	64	57	7	£11,136.00
0007728505	VDU 8455 CW KBRD IN ARGENTINE GREY	SPECRETAIL	7728505	10	0	10	£15,209.50
0007759161	WHOLE UNIT 002385/00 VDU	S25	7759161	2	1	1	£2,373.36

CCTBKR

Part Number	Description	EA3	C60L-0570-0104	2	2	2	0	0	£72.66
0007755036	CCT/BKR	EA3	C60L-0570-0104	2	2	2	0	0	£72.66
0080070546	CCT/BKR 0.5A 250V 1P W28XQ1-0.50	D2P MOD310	80070546	14	14	14	0	0	£27.16
0080009765	CCT/BKR 001A 250V 1P 43500LSI 1A	2903TAPE	80009765	7	7	7	0	0	£41.09
4902564201	CCT/BKR 001A 250V 2P WTT22-551-1A	D20VM110VD	WTT22-551-1A	7	6	6	1	1	£27.02
0027530127	CCT/BKR 002A V 1P UPG6162202A	2900	27530127	1	1	1	0	0	£5.93
0080070296	CCT/BKR 003A 250V 2P 3120-F521-N7T1-R01D-3A	D3 MOD K3	80070296	58	58	58	0	0	£222.14
0007727765	CCT/BKR 005A 050V 1P	FDS 640	95657051	1	0	0	1	1	£12.91
0080009623	CCT/BKR 005A 250V 1P	2903TAPE	80009623	11	11	11	0	0	£95.15
0007719128	CCT/BKR 005A 250V 1P 92696079	EDS 80	7719128	10	7	7	3	3	£268.10
0007739222	CCT/BKR 007A	FDS 640	95657063	42	42	42	0	0	£564.48
0007707412	CCT/BKR 007A 050V 1P 92696047	EDS 100	92696047	2	2	2	0	0	£33.20
0007719127	CCT/BKR 008A 240V 2P AM2-Z143-1	EDS 80	94245205	4	0	0	4	4	£91.44
0007727764	CCT/BKR 010A 050V 1P	FDS 640	95657052	1	0	0	1	1	£14.38
0080009397	CCT/BKR 010A 250V 1P APG6162103A	2903TAPE	APG6162103	2	2	2	0	0	£23.04
0007707408	CCT/BKR 015A 250V 2P	EDS 100	94245207	3	2	2	1	1	£166.53
0080071742	CCT/BKR 020A	ESSEX	80071742	3	3	3	0	0	£191.55
0007727763	CCT/BKR 020A 050V 2P UPL111R0732	FDS 640	95647228	2	0	0	2	2	£47.24
0080071743	CCT/BKR 025A	ESSEX	80071743	2	2	2	0	0	£127.70
0027530131	CCT/BKR 030A V 1P UPG6162303A	2900	UPGI-1-1-62-303A	1	1	1	0	0	£8.22
0007728303	CCT/BKR 030A V 2P UPL11129620	EDS 80	94245220	1	1	1	0	0	£21.40
700222325	CCT/BKR 1.92AMP HOLD	DATAHECKE	017-002222-325	7	3	3	4	4	£4.69
0080071135	CCT/BKR 12A	D60P PROC	80071135	42	42	42	0	0	£271.32
0080072340	CCT/BKR 20AMP UL/CSA	DRS 6000	80072340	4	4	4	0	0	£27.04
0080070039	CCT/BKR 33A UL	ESSEX	80070039	1	1	1	0	0	£73.93
0007756782	CCT/BKR 5.5A	FDS 640	95657064	1	1	1	0	0	£14.01
0080071201	CCT/BKR THERMAL 15AMP	D60P PROC	80071201	4	0	0	4	4	£12.16

Diode

0007722240	DIODE				44672225	1	1	0	£3.83
0080051688	DIODE	RECT PIV=800V IF=32A	D3 MOD K2		80051688	1	1	0	£2.51
0007714384	DIODE	LED	EDS 80 FHD		7714384	4	4	0	£5.76
0007720031	DIODE	LED	EDS 80 FIR		94367112	17	17	0	£203.15
0005108178	DIODE	18DB6A RECT CS223	2900		5108178	2	2	0	£2.02
00L0817489	DIODE	1N4003 RECT D041 CS140	DRS 300		817489	319	319	0	£31.90
0005110372	DIODE	1N4004 RECT D041	1900		5110372	9	9	0	£0.63
0007037058	DIODE	1N4005 RECT D041 CS140	1900		7037058	51	51	0	£3.06
0005036277	DIODE	1N4006 RECT D041 CS140	COMMS SYST		5036277	15	15	0	£0.75
00L0876746	DIODE	1N4007 RECT D041	FDC	DIODE 1N4007		61	61	0	£3.66
0007938548	DIODE	1N4448	50814/179	A4101932		1093	1093	0	£10.93
0028820364	DIODE	1N4448 RECT D035	2900	28820364		105	101	4	£6.30
0080001863	DIODE	1N4721 RECT A179		80001863		4	4	0	£5.84
4900326620	DIODE	1N4747A Z20V0 D041	1500	1N4747A		8	8	0	£0.56
4900326622	DIODE	1N4749A Z24V0 D041	1500	056-9003266-22		49	49	0	£2.45
4900326625	DIODE	1N4752A Z33V0 D041	1500	1N4752A		2	2	0	£1.90
0005110335	DIODE	1N4756A CS122.47	2900	1N4756A		12	12	0	£1.08
0005110340	DIODE	1N4761A Z75V0 CS122	D20V VDUK/	5110340		3	3	0	£0.27
0007706615	DIODE	1N4785 SIG T03		1N4785		4	4	0	£15.44
0007722207	DIODE	1N4933 RECT A398	7500	7722207		9	9	0	£0.63
4901796712	DIODE	1N5232B Z05V6 A398	DRS RETAIL	9017967-12		69	69	0	£6.90
0005110520	DIODE	1N5342B Z06V8 A1 CS125	1900	5110520		44	44	0	£10.56
4901797932	DIODE	1N5343B Z07V5 A1	1500	4901797932		23	23	0	£35.65
0005110525	DIODE	1N5348	FDS 640	1N5348		7	7	0	£3.85
0005110526	DIODE	1N5349B Z12V0 CS125	D20P MOD14	5110526		6	6	0	£1.80
0005110531	DIODE	1N5357B SILICON 5W 20V 05% CS125 D029	D2V MOD 30	5110531		1	1	0	£0.12
0005110542	DIODE	1N5370B Z56V0 D029 CS125	2900	1N5370B		26	26	0	£9.88
0005110543	DIODE	1N5372B REFERENCE 5W 62V 5%	D2V MOD 30	5110543		18	18	0	£3.96
0005108180	DIODE	1N5379B REFERENCE 5W 110V 5%	D2V MOD 30	5108180		1	1	0	£0.21
4902442401	DIODE	1N5817 RECTIFIER SCHOTTKY AXIAL	D20P MOD14	9024424-01		187	187	0	£43.01
0028820381	DIODE	1N707A Z07V1 A398		1N707A		1	1	0	£0.19
0005025093	DIODE	1N751A Z05V1 A1	1900	5025093		248	248	0	£14.88
0005036373	DIODE	1N751A Z05V1 A1	D3V PV1C	5036373		32	32	0	£0.32
0007709902	DIODE	1N91 RECT A308	EDS 100	1N91		34	26	8	£24.48
00L0883288	DIODE	1N914 RECT A398	1900	1N914		83	83	0	£0.83
0005072625	DIODE	40HF10 RECT D05 CS64	1900	5072625		13	13	0	£11.96
0007759909	DIODE	48A 800V TWIN PACK	D60 UPS	01803188		15	15	0	£440.55
0080007006	DIODE	5082-4882 LED CS303	2900	HIMP-3001		53	53	0	£6.36
0080999640	DIODE	9640 RECT D034	2900 O STA	5058942		8	8	0	£0.08
4901796801	DIODE	A14A	D20F M16VD	4901796801		62	62	0	£8.68
0007707842	DIODE	A14A RECT A94	COMMS SYST	7707842		7	7	0	£2.59
0080050494	DIODE	B380C3700/2200 RECT BRIDGE RADIAL	D2V MOD 30	80050494		1	1	0	£0.86
0007731406	DIODE	BA157	D88P CONT	7731406		16	16	0	£4.64
0007943532	DIODE	BA159GP	50814/179	JF0062		9	9	0	£1.44
0080053330	DIODE	BAV10 RECT D035	D50F PROC	80053330		94	94	0	£0.94
0007962187	DIODE	BAV45	50814/179	RKZ120303		315	315	0	£154.35
0007701837	DIODE	BAY72 RECT D035	7701837	7701837		50	50	0	£3.00

0080007116	DIODE BY184 SIG A1		80007116	45	45	0	£1 35
0007731408	DIODE BY206	D88P CONT	BY 206	38	38	0	£1.90
0007943527	DIODE BY228	50814/179		38	38	0	£17.48
0007731409	DIODE BY298	D88P CONT	BY298	275	275	0	£33 00
0080048469	DIODE BY299	D20V VDUK/	80048469	1888	1888	10	£303.68
0080051015	DIODE BYD73G RECT SILICON FAST RECOV	D2V MOD 30	80051015	7	7	0	£2.87
0080051887	DIODE BYV28-200 RECT AXIAL	D2V MOD203	80051887	43	43	0	£8.60
0080048466	DIODE BYV32-100	D20V VDUK/	80048466	23	23	0	£14 49
0080053597	DIODE BYV32-150 DUAL FAST RECOVERY	DRS 300	80053597	4	4	0	£2 80
0080051011	DIODE BYV34-400 RECT SILICON DUAL F/REC	D2V MOD 30	80051011	1	1	0	£1.48
0080047580	DIODE BYW29-100 RECT CS393	D20V M6 VD	80047580	14	14	0	£6 02
0080037956	DIODE BYW30-100 RECT D04 CS362		BYW30-100	1	1	0	£2 19
0080051012	DIODE BZW03C15 REFERENCE 1 75W 15V 5%	D2V MOD 30	80051012	1	1	0	£0 30
0007723154	DIODE BZX79C10 Z10V0 D035	2900	4822-130-34297	8	8	0	£0.56
0007723153	DIODE BZX79C4V7 Z04V7 D035	2900	53393A	55	55	0	£3 30
0005027682	DIODE BZX79C7V5 Z07V5 D035 CS124	FDC	5027682	37	37	0	£1 85
0005047651	DIODE BZY88C10 Z10V0 D07	DRS 300	5047651	34	34	0	£2.04
0005057699	DIODE BZY88C13 Z13V0 D07	DRS 300	5057699	30	30	0	£0.90
0005040271	DIODE BZY88C15 Z15V0 D07		5040271	68	68	0	£3 40
0005047654	DIODE BZY88C18 Z18V0 D07	DRS 200	DIODE BZDY88C18	35	35	0	£0.70
0005040272	DIODE BZY88C20 Z20V0 D07		5040272	11	11	0	£0 33
0005055155	DIODE BZY88C27 Z27V0 D07	2900	5055155	973	973	0	£19 46
0005030623	DIODE BZY88C3V6 Z03V6 D07		5030623	149	149	0	£11 92
0005069920	DIODE BZY88C3V9 Z03V9 D07		5069920	58	58	0	£1 74
0080050838	DIODE BZY88C7V5 REF 400MW 7 5V	D3P MODSM5	80050838	7	7	0	£0.21
0005023701	DIODE BZY95C15 Z15V0 D01	1900	5023701	32	32	0	£27 84
0080027057	DIODE CS271 RECT D05 CS271		50HQ030	6	6	0	£21.18
0007764378	DIODE DUAL DB1/DB2	D60 UPS	01803598	2	0	2	£37.68
0005078141	DIODE FLV5004 LED CS100/RED		5078141	292	292	0	£8.76
0007949057	DIODE GP30J=BY253	50814/179	RKZ123453/6	13	13	0	£5 72
0080050369	DIODE HLMP-3519 LED GREEN	D3 MOD K1	80050369	64	64	0	£6 40
7003178001	DIODE IN5391	DATA CHECK	7003178001	1	0	1	£0 04
7001568004	DIODE IN5404	DATA CHECK	014-001568-004	8	8	0	£1.36
0080051128	DIODE LED GREEN R/A MOUNT HLMP-3519-010	D3V MOD303	80051128	43	43	0	£6 45
0080048534	DIODE LED GREEN RECTANGULAR DIFFUSED	D20F M16VD	80048534	6	6	0	£0 78
0007757441	DIODE LED GRN	D50F CONTR	033622E	10	10	0	£25 30
0007757475	DIODE LED RED	D50P OSCAR	123-00087-00	1	1	0	£1.79
0080050367	DIODE LED RED	D3P MOD A1	80050367	20	20	0	£2.80
0007962284	DIODE LED RED 5MM	50814/095		93	93	0	£32.55
0080050368	DIODE LED YELLOW	D3P MOD A1	80050368	21	21	0	£2 73
0007935935	DIODE LI 1000V 3A	50814/179	78501440	292	292	0	£35 04
0007961501	DIODE LIB 800V 4A	50814/179		21	21	0	£18.06
7007087002	DIODE MJE 3439	DATA CHECK	7007087002	1	0	1	£0 43
0007722882	DIODE MR501 RECT A282		MR501	15	15	0	£2 55
4900849401	DIODE MR751 RECT A264	7500	063660G	11	11	0	£3.41
0007727791	DIODE MR754 RECT	EDS 80 FIR	MR754	12	12	0	£5.88
0007731554	DIODE MR824	D88P CONT	DIODE MR824	2	2	0	£2 94
4901730401	DIODE MR850	DRS 20	4901730401	20	20	0	£5 40

4901798502	DIODE MV5753	D20P MOD50	9017985-02	11	11	0	£1 10
4901798501	DIODE MV5754 LED	D20V M10VD	4901798501	98	98	0	£8.82
00L0866633	DIODE OA200 RECT D07	2900	866633	24	24	0	£0.24
00L0860836	DIODE OA202 RECT S06	1900	L0860836	7	7	0	£0.49
0080051043	DIODE RECT	D3P MOD A	80051043	14	14	0	£32.48
0080050634	DIODE RECTIFER SCHOTTKY	DRS 300	80050634	2	2	0	£1.94
0080050309	DIODE RECTIFIER	D3P MOD A1	80050309	21	21	0	£1.89
0005110535	DIODE REF 5W 30V +-5%	D3P MOD A	5110535	25	25	0	£3.00
0080050276	DIODE REF BZX79B5V6 5.6V	D3P MOD A1	80050276	22	22	0	£0.44
0080037944	DIODE RGP10M CS361	D20P MOD14	80037944	187	187	0	£24.31
0007943536	DIODE RGP15J	50814/179	JF0074	42	42	0	£20.58
0005026010	DIODE S4AN12 RECT D04		SW04PCN012	21	21	0	£34.86
0080007389	DIODE S8M3 RECT A52		8007389	9	9	0	£1.26
4901275798	DIODE SIL40A	FDS 640	95654206	3	3	0	£18.84
0005108166	DIODE TIL209 LED CS200	D20P M30K/	BS/003561/00	5	5	0	£1.85
0080027419	DIODE TIL234-2 LED CS298 GREEN	2900	HLMP-3502	144	144	0	£69.12
0007962188	DIODE ZE 33V 0.5W BZX55C33	50814/179		75	75	0	£2.25
7014285032	DIODE ZENER QDZ HZ6AX3B	DATA CHECK	7014285032	1	0	1	£0.05
0007935993	LED (IR)	50814/234	79500136	933	933	0	£615.78

Disp2

0007823328	DIODE	NORTEL	NT891193-2	1	1	0	£1.28
0007823323	DIODE	NORTEL	NT891147-1	7	7	0	£8.33
0007823350	DIODE	NORTEL	NT891321-1	2	2	0	£3.00
0007823304	DIODE	NORTEL	NT888065-4	2	2	0	£1.92
0007823940	DIODE	NORTEL	NT51611535	52	52	0	£17.68
0007823957	DIODE	NORTEL	NT51631010	95	95	0	£0.95
0007823958	DIODE	NORTEL	NT51633002	35	35	0	£2.45
0007823949	DIODE	NORTEL	NT51622490	16	16	0	£0.96
0007823948	DIODE	NORTEL	NT51622331	34	34	0	£123.08
0007823947	DIODE	NORTEL	NT51622310	28	28	0	£4.76
0007823944	DIODE	NORTEL	NT51621325	47	47	0	£4.70
0007823943	DIODE	NORTEL	NT51621321	7	7	0	£1.12
0007823942	DIODE	NORTEL	NT51621309	5	5	0	£1.15
0007823941	DIODE	NORTEL	NT51611900	2	2	0	£2.50
0007731205	DIODE LED	LPTR PB144	44682295	32	32	0	£40.00
0007732226	DIODE LED	MARS DEFAU	27-57152-000	5	5	0	£2.65
0007722780	DIODE LED AMP 581-218	LPS	590282	9	9	0	£13.23
0007734257	DIODE LED YELLOW	MTU	BS/006332/00	15	15	0	£3.30
0080048094	DIODE Z12V0	MARS DEFAU	80048094	130	130	0	£29.90
0007823205	DIODE 861029-38	NORTEL	NTSYC05066	2	2	0	£1.92
0007823220	DIODE 891029-	NORTEL	NTSYC05118	2	2	0	£2.08
0007823204	DIODE 891029-54	NORTEL	NTSYC05063	2	2	0	£1.48
0007804090	DIODE 1.5KE 400A	MARS DEFAU	7804090	4	4	0	£23.56
0007729683	DIODE 103R LED SEL	OFFPTR ML8	LP-44373	2	1	1	£0.44
0080002080	DIODE 16F10 RECT D04	MTU 60KB	011566H	6	6	0	£11.76
0007820611	DIODE 1N1183	NORTEL	NT51634010	10	10	0	£9.40
0005015881	DIODE 1N1184A RECT D05	MARS DEFAU	95654205	1	1	0	£2.95

Diode

0007820612	DIODE 1N2132	NORTEL	NT51638000	17	17	0	£41.14
0007822629	DIODE 1N270	NORTEL	NT891126	75	75	0	£31.50
0007823170	DIODE 1N2982B	NORTEL	NT51621720	2	2	0	£8.42
0007823171	DIODE 1N2988B	NORTEL	NT51621726	42	42	0	£218.82
0007823190	DIODE 1N3288A	NORTEL	NT51634000	11	11	0	£48.95
0007823191	DIODE 1N3467	NORTEL	NT51651208	4	4	0	£0.36
0007758997	DIODE 1N3600 DO-7	NTWKNPS	1N3600	5	5	0	£2.50
0007820653	DIODE 1N4140	NORTEL	NT51633010	8	8	0	£1.36
0007823192	DIODE 1N4381	NORTEL	NT51651435	16	16	0	£4.96
0007823183	DIODE 1N4454	NORTEL	NT51631000	188	188	0	£18.80
0005042571	DIODE 1N4728A Z03V3 D03	MARS DEFAU	5042571	12	12	0	£0.84
4450604500	DIODE 1N4742 Z12V0 D041	KEY EDIT	IN4742A	108	108	0	£5.40
4900326616	DIODE 1N4743A Z13V0 D041	MARS DEFAU	4900326616	30	30	0	£6.30
0007822646	DIODE 1N4760	NORTEL	NT891309-1	3	3	0	£0.72
4701217803	DIODE 1N4936 RECT A398	MARS DEFAU	1N4936 S/N 75731X	59	59	0	£5.90
0007823176	DIODE 1N5075	NORTEL	NT51622400	4	4	0	£11.68
4700464600	DIODE 1N5228B Z03V9 A398	MARS DEFAU	4700464600	6	6	0	£4.38
4900436214	DIODE 1N5348A Z11V0 A1	MARS DEFAU	4900436214	2	2	0	£0.84
4900436215	DIODE 1N5349A Z12V0 A1	MARS DEFAU	1N5349A	1	1	0	£0.52
0076846561	DIODE 1N5400 RECT	MICROPOLIS	1N5400	37	37	0	£2.59
0080037991	DIODE 1N5407 CS369	MARS DEFAU	80037991	72	72	0	£7.20
0005042569	DIODE 1N753A Z06V2 A1	MARS DEFAU	5042569	175	175	0	£33.25
0007823184	DIODE 1N914B	NORTEL	NT51631003	35	35	0	£1.05
0007731381	DIODE 1S1588	OFFPTR R16	7731381	36	36	0	£2.52
0007732772	DIODE 1S1834	OFFPTR R16	7732772	11	11	0	£4.62
0007733420	DIODE 1S2075	OFFPTR ML8	LP-9300	1	1	0	£0.02
00L0889402	DIODE 1S44 RECT A9 CS23	MARS DEFAU	889402	17	17	0	£0.17
0005021379	DIODE 1S921 SIG A60	MARS DEFAU	5021379	10	10	0	£0.30
0007822634	DIODE 2N5830	NORTEL	NT891222-1	2	2	0	£0.48
0005070490	DIODE 40HF20 RECT CS64	MARS DEFAU	40HF20	6	6	0	£7.38
0007724711	DIODE 580120	LPS	580120	37	37	0	£7.77
0080000224	DIODE 6FR20 RECT D04	MTU MT12	6FR20	9	9	0	£9.36
0007713133	DIODE 94822 GRN LED	MARS DEFAU	7713133	28	28	0	£9.80
0007713862	DIODE ASSY LED	LPTR	50519901	43	37	6	£3,283.48
0007750154	DIODE ASSY LED	LPTR LP200	343088B	18	16	2	£4,202.28
0080050121	DIODE BAT85	OPD WSTNUK	BAT 85	14	14	0	£0.42
0007804623	DIODE BY207	MARS DEFAU	DIODE BY207	4	4	0	£0.60
0080003643	DIODE BY299S RECT S078	MARS DEFAU	80003643	8	8	0	£0.08
0007803639	DIODE BYV32-200	MARS DEFAU	DIODE BYV32-200	11	11	0	£11.22
0007733964	DIODE BYX71-350R	NTWKPRNT	1063 10 06 10I2	2	2	0	£6.34
0007729265	DIODE BZX55C13 Z13V0 D035	OFFPTR LX2	7729265	6	6	0	£3.30
0007729244	DIODE BZX55C6V6 Z06V2 D035	OFFPTR LX1	7729244	85	85	0	£8.50
0007752620	DIODE BZX79C12V Z12V0	OPD COL50H	DZ79121FC0	35	35	0	£1.75
0007752618	DIODE BZX79C33V Z33V0	OPD COL50H	BZX79C33V	11	11	0	£0.55
0080050170	DIODE BZX79C3V0 Z03V0	OPD WSTNUK	80050170	46	46	0	£2.76
0007815528	DIODE BZX85C13 Z13V0 D041	NTWKNPS	BZX85C13	41	41	0	£4.92
0007701935	DIODE BZY88C3V3 Z03V3 D07	OPD WSTNUK	055160C	23	23	0	£0.46
0005032750	DIODE BZY88C4V3 Z04V3 D07	MARS DEFAU	5032750	162	162	0	£11.34

Diode

0007701743	DIODE BZY88C5V6 Z05V6 D07	MARS DEFAU	7701743	87	87	0	£5.22
0005027683	DIODE BZY88C6V8 Z06V8 D07	MTU	5027683	7	7	0	£0.14
0080037406	DIODE BZY93C47R Z47V0 D04 CS336	MARS DEFAU	BZY 93 C47R	8	8	0	£8.80
0005032960	DIODE BZY95C33 Z33V0 D01	MARS DEFAU	5032960	3	3	0	£2.58
0005032817	DIODE BZY96C9V1 Z09V1 D01	MARS DEFAU	5032817	1	1	0	£0.96
0080000776	DIODE C16MBS10C RECT	MARS DEFAU	80000776	2	2	0	£1.44
0007732776	DIODE CTU32R	OFFPTR R16	7732776	1	1	0	£2.68
0007734477	DIODE D0403	MARS DEFAU	1-021-0403	32	32	0	£35.84
0007757215	DIODE D1CA20 ARRAY	OFFPTR ML2	761A2232M0401	12	12	0	£5.16
0007756927	DIODE DAN202K	OFFPTR ML1	611A0003N0003	30	30	0	£4.50
0007756925	DIODE DSA1A2	OFFPTR ML1	610A0021L0090	19	19	0	£1.52
0007756980	DIODE DSA1A2	OFFPTR ML1	610A0003M0001	29	29	0	£2.32
0007756926	DIODE DSA1C1	OFFPTR ML1	610A0021L0089A	34	34	0	£4.08
0007703848	DIODE FD02308	LPTR PBS 3	11803000	8	8	0	£3.84
0007732781	DIODE HZ18-3	OFFPTR R16	7732781	8	8	0	£1.04
0007752059	DIODE HZ4CZ	OFFPRINTER	14020370	93	93	0	£5.58
0007732780	DIODE HZ6-1	OFFPTR R16	7732780	4	4	0	£0.76
0007824335	DIODE IN4006	NORTEL	NT03960076	2	2	0	£0.08
0007822850	DIODE IN4607	NORTEL	NT891344-1	2	2	0	£0.90
0007824337	DIODE IN5242	NORTEL	NT03960302	112	112	0	£31.36
0007824338	DIODE IN5341B	NORTEL	NT03960321	74	74	0	£20.72
0007804687	DIODE IN5364B	MARS DEFAU	IN5364B	17	17	0	£4.93
0007824749	DIODE IN5401	NORTEL	NTA0279976	2	2	0	£2.30
0007822632	DIODE LED	NORTEL	NT891160-1	2	2	0	£2.44
0080071167	DIODE LED ASSY ONE ELEMENT	NTWKNPS	555-2007	26	26	0	£46.54
0007822736	DIODE LED GREEN	NORTEL	NTD8017661	1	1	0	£0.92
0007824193	DIODE LED LIT704	NORTEL	NT58880001	26	26	0	£26.00
0007757214	DIODE MA152WA	OFFPTR ML2	611A0029M0002	32	32	0	£4.48
0007757279	DIODE MA153 SIG	OFFPTR ML1	611A0029N0006	36	36	0	£2.88
0007756982	DIODE MA3047-H	OFFPTR ML1	613A0291M0102H	2	2	0	£0.58
0007756929	DIODE MA3100	OFFPTR ML1	613A0103M0182	17	17	0	£2.55
0007756983	DIODE MA3240	OFFPTR ML1	613A0103M0272B	73	73	0	£11.68
0007756932	DIODE MA3300	OFFPTR ML1	613A0103M0292	19	19	0	£3.04
0007821670	DIODE MR 758	NORTEL	NT891254-5	2	2	0	£1.42
0007714777	DIODE MR820 RECT A264	LPTR PBS 3	7714777	9	9	0	£6.66
0007730075	DIODE MV5053 LED	NTWKNPS	065084G	2	2	0	£0.22
0007730076	DIODE PC0125 LED	NTWKNPS	PC0125-B-R	79	79	0	£53.72
0007729247	DIODE PFR851	OFFPTR LX1	7729247	2	2	0	£0.84
0007756984	DIODE RD10F-B	OFFPTR ML1	613A2232L0182	33	33	0	£1.65
0007733459	DIODE RD12EB Z12V0	OFFPTR ML8	LP-44171-17	11	11	0	£0.88
0007756981	DIODE RD2 7	OFFPTR ML1	613A0233M0042A	35	35	0	£2.80
0007731495	DIODE RD39EB Z39V0	OFFPTR R16	7731495	20	20	0	£3.80
0007757212	DIODE RD39F-B	OFFPTR ML2	613A2232L0322	34	34	0	£5.44
0007733460	DIODE RD5.6EB Z05V6	OFFPTR ML8	LP-44171-9	8	8	0	£0.64
0007733416	DIODE RD6 2EB Z06V2	OFFPTR ML8	LP-44171-10	15	15	0	£1.05
0080037457	DIODE RGP30B CS345	MARS DEFAU	204719E	71	71	0	£7.10
0007732774	DIODE RM1Z	OFFPTR R16	7732774	31	31	0	£5.27
0080002079	DIODE S1AR20 RECT D04	MARS DEFAU	80002079	9	9	0	£10.17

Diode

0007732782	DIODE S5VB40	OFFPTR R16	7732782	2	2	0	£4.76
008000110	DIODE SG1848	MARS DEFAU	8000110	1	1	0	£0.03
0007822645	DIODE TIR201A	NORTEL	NT891305-1	7	7	0	£7.42
0007820652	DIODE TN40002 MM13007	NORTEL	NT51633003	2	2	0	£0.14
0EE0216254	DIODE U3344-2	MARS DEFAU	EE0216254	2	2	0	£0.92
0007733421	DIODE V09C	OFFPTR ML8	LP-44117-1	44	44	0	£13.64
0007752837	DIODE Z02V4	MARS DEFAU	BZX7902V4	13	13	0	£1.30
0007734494	DIODE Z0405	MARS DEFAU	7734494	4	4	0	£3.28
0007823214	DIODE Z13 0 ASTERNETICS	NORTEL	NTSYC05110	17	17	0	£9.69
0007823213	DIODE Z23 6 ASTERNETICS	NORTEL	NTSYC05109	17	17	0	£8.16
0007822626	DIODE ZENER 13V	NORTEL	NT89102973	2	2	0	£1.84
0007823177	DIODE ZENER 5.1V 1%	NORTEL	NT51622452	43	43	0	£107.07
0007824764	DIODE ZENER IN4736A	NORTEL	NT51622001	10	10	0	£50.00
0007823351	DIODE ZENER L1H & RFOG	NORTEL	NT891327-1	2	2	0	£0.98
0007823099	LED ASSY FRONT PANEL	NORTEL	NT10360001	1	0	1	£13.57
0007767270	LED BOARD	MARS DEFAU	55 47403.001	2	2	0	£5.34

disp3

0007761738	BOARD LED 1116SX/ICL M35	PCTPM50-00	55 11202 241	202	202	0	£963.54
0007755421	DIODE LED TYPE MV55BA	POS OST	036239D	68	68	0	£10.88
0007729823	DIODE LED	POS TERMIN	SD20446	18	18	0	£31.50
0007730480	DIODE 1N3064	PERQ 1	54-1000-001	4	4	0	£0.84
0007702006	DIODE 1N4001 RECT D041 CS140	POS TERMIN	056-9001940-00	7	0	7	£0.35
4900194002	DIODE 1N4003 RECT D041	PERQ 1	4900194002	339	339	0	£20.34
0080047799	DIODE 1N4148 S/W	PC2 MODEL	80047799	31	31	0	£1.86
4901796705	DIODE 1N5225B Z03V0 A398	POS TERMIN	1N5225B MOTOROLA	19	19	0	£0.38
0007752502	DIODE 1N5260B	PERQ 2	1N5260B	11	11	0	£1.10
0007751850	DIODE 1N5270B	PERQ 2	7751850	57	57	0	£4.56
4900436235	DIODE 1N5375 Z82V0 A1	POS TERMIN	IN5375B	20	20	0	£4.80
0007739648	DIODE 1N5406	PERQ 2	32967D	7	7	0	£0.56
0007731633	DIODE 1S2076	POS TERMIN	QDSS207XB	18	18	0	£3.96
0007755524	DIODE 1SS119	PDCUCKOK73	10781	16	16	0	£1.44
0007731690	DIODE 3P20M5 Z04V3	POS TERMIN	QDZ4R3203A	98	98	0	£74.48
0007733651	DIODE 5082-4160 LED	POS OST	7733651	2	2	0	£0.60
4901733903	DIODE 555-0406 LED	POS CONTRL	4901733903	1	0	1	£0.29
0007756245	DIODE 5AR2 LED	PCDUMKOKMK	10177	17	17	0	£3.23
0007730454	DIODE ASSY LED INDEX/SECTOR	PERQ 1	51029-0	1	1	0	£11.61
0086019990	DIODE ASSY FOR 008125/03	PCQ XM250	86019990	36	36	0	£26.28
0007756396	DIODE ASSY LED	POS SCANNE	D860-9030-V520	3	0	3	£10.59
0007758938	DIODE ASSY LED	POS SCANNE	D860-8704-V530	1	0	1	£5.34
0007751884	DIODE BR62	PERQ 2	160-0203-00	17	17	0	£68.00
0007734807	DIODE BYV27-100	PC2 MODEL1	BYV 27-100	1	1	0	£0.35
0007734838	DIODE BYV27-200	PC2 MODEL1	DG27200	23	23	0	£8.28
0007739916	DIODE BYV96E	PERQ 2	057116A	150	150	0	£21.00
0007739917	DIODE BYW96E	PERQ 2	057121G	1	0	1	£0.43
0007701922	DIODE BZY88C4V7 Z04V7 D07	PERQ 1	7701922	70	70	0	£4.20
0007739918	DIODE BZY88C5V1 Z05V1	PERQ 2	BZY79C5V1	16	16	0	£1.28
0007734213	DIODE BZY88C7V5 Z07V5	PC1 MOD 10	DIODE BZY88C7V5	26	26	0	£0.78

0007734841	DIODE DZ16V800W5	PC2 MODEL1	DZ16V800W5	1	1	0	£0.30
0007760773	DIODE IN4001 REC 50V	PCTPM95-00	06-1R005-030	17	17	0	£0.34
0007752503	DIODE MR2406FR	PERQ 2	MR2406FR	148	148	0	£259.00
0080047814	DIODE MV54124 LED GREEN RECTANGULAR	PC2 MODEL1	80047814	10	10	0	£2.60
4901688002	DIODE R711A RECT T03	POS TERMIN	4901688002	1	1	0	£2.36
0007755523	DIODE RD10E-B-1	PDCUCKOK73	10780	17	17	0	£1.36
0007739319	DIODE RD13EB Z13V0	POS TERMIN	90460001	3	3	0	£0.45
0007755526	DIODE RD16E-B-3	PDCUCKOK73	10783	17	17	0	£1.36
0007760474	DIODE RGP10J	PCTPDISCLE	7760474	78	78	0	£13.26
0007760475	DIODE RGP15D	PCTPDISCLE	7760475	53	53	0	£11.66
4901798404	DIODE S25A10 RECT D05	POS CONTRL	056-9017984-04	2	2	0	£4.26
0080051191	DIODE VARACTOR	PWS BASEUN	80051191	4	4	0	£2.40
0007739645	DIODE ZN404	PERQ 2	069130	40	40	0	£1.20
0007756367	DIODE ZPD27P	PC2 MODEL1	DZ227V00W5	17	17	0	£5.95
0007768661	LED	PS NOTEBK	BEGR0008T03	28	28	0	£17.08
0080062472	LED ASSY CS486s	PCSCSPRING	80062472	29	21	8	£140.94
0080062859	LED GREEN	PS BASE386	143143-0049	17	17	0	£1.70
0007768052	LED LENS	PCNB NOTEB	EA032801204	28	28	0	£3.36
0007764271	LED PCB	PCSCSPRING	AA401026	26	23	3	£73.84
0007769525	LED UNIT	PP2125	B020-1860-W522A	3	3	0	£112.26

Disp4

0007710101	DIODE LED	SERVICE AI	5082 4882	11	11	0	£8.14
4901733901	DIODE LED GRN	S25	056-9017339-01	9	8	1	£3.42
4901733902	DIODE LED YEL	S25	056-9017339-02	1	0	1	£0.38
4900663314	DIODE 1N3616 RECT D04	S10	A-2-92571	13	13	0	£14.04
0001101444	DIODE 1N4371A Z02V7 D07	S10	1N4371A	148	148	0	£17.76
4900326605	DIODE 1N4732A Z04V7 D041	S10	1N4732A	5	5	0	£0.45
4900326607	DIODE 1N4734A Z05V6 D041	SERVICE AI	1N4734A	5	5	0	£0.90
4900326610	DIODE 1N4737A Z07V5	S10	BZY97C7V5	3	3	0	£0.93
4900326613	DIODE 1N4740A Z10V0 D041	S10	1N4740A	56	55	1	£7.28
0005110328	DIODE 1N4749 Z24V0 D041	SERVICE AI	5110328	7	7	0	£0.98
0005110332	DIODE 1N4754A Z39V0 D015 CS122	SERVICE AI	1N4754A	1	1	0	£0.17
0007739828	DIODE 1N4947GP	S25 M84 VI	13-94871-1	1	1	0	£0.93
4901400691	DIODE 1N5234 Z06V2 A398	S10	1N5234B	23	20	3	£2.07
4901796720	DIODE 1N5240B Z10V0 A398	S25	1N5240B	35	35	0	£4.20
4901796727	DIODE 1N5243 Z13V0 D041	S25	675475	3	3	0	£0.03
4901640696	DIODE 1N5245B Z15V0 A398	S10	4901640696	2	2	0	£0.98
4901640686	DIODE 1N5248B Z18V0 A398	S10	4901640686	12	12	0	£1.08
0007711773	DIODE 1N5395 RECT D015	SERVICE AI	7711773	16	16	0	£1.12
0007734442	DIODE 1N5621GP	S25 M84 VI	1N5621	3	3	0	£0.60
0005110923	DIODE 1N5624 RECT CS163	SERVICE AI	1N5624 MR501 OR 3051	1	1	0	£0.09
0007739191	DIODE 1N6263	S25/2 PROC	DG1001	3	3	0	£1.05
0005036349	DIODE 1N747A Z03V6 A1	S10	1N747A	101	101	0	£9.09
4901796501	DIODE 1N914B RECT A398	S25/2 PROC		2	2	0	£0.12
0005042575	DIODE 1N965B Z15V0 A398	S10	1N965B	34	34	0	£2.04
0007727981	DIODE 2059	S25	49-2059A00	11	11	0	£37.29
0007739433	DIODE 51HQ045	S25/2 PROC	DTS6045	17	17	0	£94.69

Diode

0007734441	DIODE 73B03	S25 M84 VI	48-02073B03	9	9	0	£21.69
0005110201	DIODE A114A RECT D027 CS119	SERVICE AI	5110201	24	24	0	£0.24
4901798201	DIODE A15A RECT A249	S10	4901798201	21	21	0	£2.52
0007739136	DIODE BYW96E	SERVICE AI	DG96E	6	6	0	£6.18
0007712135	DIODE BZX85C5V1 Z05V1 DO41	SERVICE AI	059779A	11	11	0	£0.88
0005110251	DIODE BZY88C11 Z11V0 D07 CS124	SERVICE AI	BZY88C11V	40	40	0	£14.00
0007727983	DIODE D1K	S25	48-134978	26	26	0	£52.52
0765520120	DIODE FD624	S10	24553500	7	7	0	£4.27
4701215701	DIODE FDH600 RECT A1	S10	FDH600	17	17	0	£0.34
0080048148	DIODE HLMF-0504 CS419/GREEN	S25	80048148	65	65	0	£12.35
4902464903	DIODE LN410YP LED YELLOW SQ	S25 M84 VI	9024649-03	15	15	0	£1.35
0007753026	DIODE MR752	S25/2 PROC	DIODE MR752	13	13	0	£5.98
0007729138	DIODE MR817 RECT	S10	MR817 RECT	6	6	0	£11.46
0007739827	DIODE MR818	S25 M84 VI	13-94543-1	8	8	0	£6.56
0005110209	DIODE MR851 RECT D027 CS120	SERVICE AI	5110209	3	3	0	£0.99
0007739829	DIODE MR854	S25 M84 VI	MR854 63690F	1	1	0	£0.34
0005110210	DIODE MR854 RECT D027 CS120	SERVICE AI	5110210	5	5	0	£1.85
4900726826	DIODE MR890	SERVICE AI	4900726826	4	4	0	£57.52
0007728907	DIODE MV5752 LED	S25	7728907	3	3	0	£0.63
0007730331	DIODE V334X	S25 M84 VI	063690F	1	0	1	£0.36
0007753076	DIODE ZPD3 3 Z03V3 D035	S25/2 PROC	DIODE ZPD3.3	58	58	0	£1.74
0007753074	DIODE ZPD5.1 Z05V1 D035	S25/2 PROC	DIODE ZPD5.1	25	25	0	£0.75
0007753134	DIODE ZPD6 2 Z06V2 D035	S25/2 PROC	DIODE ZPDD6 2	34	34	0	£1.02
0005047627	DIODE ZY33 Z33V0 A1	SERVICE AI	1N4752A	42	42	0	£3.78
0007771573	LED ASSEMBLY	TS0 C450I	60.41616.001	30	30	0	£35.70

Part Number	Description	Quantity	Unit Price	Supplier Part	Material Code	Close Stock Value
0765110413	COIL MAGNET 110 OHMS TT 272M	1	272M		0	£27.85
0007830223	MAGNET	1	1595 56 20-00/8		0	£2.95
5100004130	MAGNET DRIVER	10	5100004130		6	£1,437.40
0007929069	MAGNETIC HEAD ASSY	226	50814/240		0	£25,897.34

Disp2

0007727375	MAGNET	2	483001	LPS	1	£8.74
0005078360	MAGNET	12	5078360	LPTR	0	£50.16
0007723647	MAGNET & STUD ASSY CDC 44675646	7	44675646	LPTR PBS 7	0	£140.35
0007764067	MAGNET ASSY	7	B020-7430-V166A	LPS PP250	3	£854.84
0007763537	MAGNET ASSY REVERSE	3	B020-7430-W168A	LPS PP250	0	£429.51
0007820678	MAGNET BAR 478	12	7820678	NORTEL	0	£80.28
0007730539	MAGNET HAMMER	48	7730539	OFFPTR R16	0	£251.04
0007822419	MAGNET HOLDER ASSY 503	1	NT82610027	NORTEL	0	£119.07

Disp3

0007754044	MAGNET 0024V	1	09.725 165	POS	0	£9.11
0007769130	MAGNET ASSY	1	B020-1810-W439A	PP2125	0	£60.11
0007731861	MAGNET J PAPER FEED TRIGGER	10	C901273000	POS TERMIN	5	£15.00
0007731860	MAGNET R PAPER FEED TRIGGER	95	C901270001	POS TERMIN	3	£537.70
0007766393	MAGNETO OPTICAL DEVICE 3.5" 128MB	29	7766393	PS MO128MB	0	£18,638.30

0007733313	CABLE AND PCB ASSY	COMMON	257-274-503	2	1	1	£26.84
0007961437	CONTROL PCB DISTR UNIT E17	50814/250	ROA1199453	15	5	10	£6,418.05
0007737016	EXTRACTOR PCB	FDS 2500	C960-0300-T001	208	0	0	£900.64
0007961110	LOGIC PCB, PT88/89-10 E38	50814/171	7151037077	6	5	1	£2,396.04
0007961112	LOGIC PCB, PT88/89-S E17	50814/171		14	14	0	£5,590.76
0007944876	MASTER PCB 7123 (NDS)	50814/058		2	2	0	£507.60
0007961660	MASTER PCB ASSY (FA-DE-EU)	50814/047	KDY1981001/11	12	9	3	£3,411.12
0007926774	MASTER PCB ASSY 4510 E17	50814/019	55368321-10	8	5	3	£893.44
0007961062	MASTER PCB ASSY 4513	50814/026	55368836-00	17	11	6	£2,211.70
0007927083	MASTER PCB ASSY 4514 E17	50814/026		9	9	0	£974.07
0007961661	MASTER PCB ASSY 7121 (NDS)	50814/048	KDY198170202	5	2	3	£1,160.00
0088800872	PCB G872 MOTHERBOARD	D20P MOD35	88800872	1	0	1	£65.18
0088808239	PCB K239 006406/04	D2V MOD203	88808239	8	5	3	£1,883.60
0088808400	PCB K400	D3P MOD A4	88808400	7	1	6	£5,201.77
0042001410	PCB "C" PROCESSOR	D2P MOD310	42001410	1	0	1	£461.68
0007752777	PCB (UNOBTAINABLE) HDLC BUFFER	D88P 8801S	7752777	3	0	3	£33.06
4901310709	PCB 005V REG	1500	4901310709	2	0	2	£77.82
0005106125	PCB 0336	2903-4	5106125	2	0	2	£246.48
0007713545	PCB 0360 RPM	1500	75890550	1	1	0	£72.00
0086010039	PCB 031 I/F MODULE	DRS 20 M 0	86010039	87	19	68	£20,688.60
0086011485	PCB 031/02 I/F MODULE	D20V VDUIK	86011485	8	3	6	£5,832.81
0085819611	PCB 0550	2900	85819611	1	0	1	£38.94
7019586000	PCB 1 92K MEMORY CMOS	DATAHECKE	701985000	199	29	170	£9,138.08
0080060592	PCB 16 PORT COMMON ELECTRONIC	D50P OSCAR	145-01431-00002	8	4	4	£9,604.32
0080060593	PCB 16 PORT RS232 PANEL	D50P OSCAR	145-01483-00000	7	5	2	£4,605.23
0007765065	PCB 16 PORT SERIAL LINE	ANNEX 3	AX3-SPR-S16-160	26	0	26	£10,827.44
0007758290	PCB 16MB STORE	D40P STORE	070AAA9801	9	0	9	£33,682.68
0007757436	PCB 16MB STORE	D50P MOD65	140-10051-00000	5	5	0	£42,108.55
0086020552	PCB 16MB STORE K568	D3S STOREY	86020552	14	2	12	£1,859.34
0005303325	PCB 1862	7500	5303325	1	0	1	£298.29
0007707490	PCB 1ATV	EDS 100	5406800	4	1	3	£573.88
0007751171	PCB 1MB MEMORY ARRAY	D50FSTOREE	7751171	8	4	4	£18,697.36
0007761908	PCB 1MB SIMM MODULE	9520/200	C76L-2180-0012	5	0	5	£343.95
7014538491	PCB 2100 SMK KEYBOARD	DATAHECK	049-014538-491	1	0	1	£17.25
0081974111	PCB 2180	2900	81974111	1	0	1	£40.12
0084421511	PCB 2181		84421511	2	2	0	£106.68
0082202311	PCB 2283	2900	82202311	1	0	1	£40.00
0082641311	PCB 2401	2900	82641311	1	0	1	£51.64
0007761907	PCB 256K SIMM MODULE	9520/200	C76L-2180-0011	3	2	1	£154.77
4902470403	PCB 256KB MEMORY	DRS 20	676905 (4902470403)	3	3	0	£914.43
0083061011	PCB 2611		83061011	1	0	1	£35.89
0083057011	PCB 2619	2903TAPE	83057011	2	0	2	£58.92
0083058211	PCB 2622	2903TAPE	83058211	1	0	1	£29.47
0083058612	PCB 2623		83058612	1	0	1	£29.46
0083059811	PCB 2626		83059811	1	0	1	£35.11
0083052613	PCB 2628	2903TAPE	83052613	5	3	2	£191.00
0083055019	PCB 2634	2900 FAMIL	83055019	13	1	12	£687.83
0084317411	PCB 2716 TRACKED	2900	84317411	1	0	1	£40.00
0083411511	PCB 2795	2903TAPE	ESR 0020 15 5 84	6	4	2	£155.46
0084165411	PCB 2887	2903TAPE	84165411	6	3	3	£516.00
0084206811	PCB 2888	2903TAPE	84206811	4	4	0	£132.52
0084164011	PCB 2889	2903TAPE	84164011	4	4	0	£188.72
0084164411	PCB 2890	2903TAPE	84164411	4	3	1	£176.88
0084207611	PCB 2891	2903TAPE	84207611	2	0	2	£58.94
0084074911	PCB 2960	2903TAPE	84074911	6	4	2	£141.00
0084218411	PCB 2963	2903TAPE	84218411	2	2	0	£119.68
0084218211	PCB 2964	2903TAPE	84218211	3	2	1	£187.77
0084186512	PCB 2974	2903TAPE	84186512	1	0	1	£29.46

0007707444	PCB 2FZV	EDS 100	54229301	1	0	1	£188.02
0007754764	PCB 2MB MEMORY 120NS	D40P MOD24	070AAA3512	32	16	16	£27,384.56
0007707446	PCB 2TLV	EDS 100	7707446	4	2	2	£774.08
0042001440	PCB 310 INTERFACE	D2P MOD310	42001440	20	3	17	£5,757.60
0007758720	PCB 32 CHANNEL I/O PANEL	D50F32PORT	140-10065-00000	23	8	15	£28,668.35
0080060580	PCB 32 CHANNEL I/O PANEL	D50P OSCAR	80060580	23	10	13	£46,408.71
0007707494	PCB 3EJV	EDS 100	54213301	1	0	1	£220.98
0007707489	PCB 3EQV	EDS 100	54215701	1	0	1	£180.72
0007713638	PCB 3FWV	EDS 100	7713638	1	0	1	£188.66
0007712579	PCB 3ZQN PRE AMP SERVO	EDS 200	73485304	5	2	3	£697.05
0005075008	PCB 4254	2900	5075008	1	0	1	£64.08
0005075012	PCB 4262	2900	5075012	3	0	3	£79.20
0005075022	PCB 4286	2900	5075022	1	0	1	£51.53
0005081604	PCB 4290 I/F SWITCH	2900	5081604	1	0	1	£56.10
0005075029	PCB 4666	2900	5075029	1	0	1	£55.48
0005057690	PCB 4805	2903-4 190	5057690	1	0	1	£16.14
0007712578	PCB 4FJV	EDS 200	7712578	4	1	3	£173.76
0007712570	PCB 4FRV	EDS 200	54226110	5	5	0	£1,027.45
0007712571	PCB 4FVU	EDS 200	7712571	2	1	1	£462.60
0007754995	PCB 4MB MEMORY 120NS	D40P MOD25	070AAA3513	132	25	107	£208,164.00
0080060574	PCB 4MB MEMORY ARRAY	D50P OSCAR	140-10002-00000	16	11	5	£50,248.00
4902084501	PCB 5.25 FLOPPY (NF)	D20P M20DS	4902084501	25	22	3	£5,684.25
4902513301	PCB 5.25 FLOPPY N/F	D20P M20DS	4902513301	6	5	1	£1,150.74
0084275711	PCB 5110	2903TAPE	84275711	1	0	1	£40.12
0084211011	PCB 5118 WRITE CONTROL	2903TAPE	84211011	4	2	2	£179.24
0084220211	PCB 5123	2903TAPE	84220211	8	0	8	£1,540.24
4902470402	PCB 512K MEMORY	D20FLVL1ME	4902470402	7	5	2	£1,998.50
0007734973	PCB 512KB MEMORY	D40F STORE	2CAAA07805	4	4	0	£1,974.64
0084492213	PCB 5141	7500	84492213	1	0	1	£27.18
0007961014	PCB 5162 MAIN BOARD MODIFIED	50814013	15123330-00	5	1	4	£1,043.15
0084907111	PCB 5165	7500	84907111	4	4	0	£387.52
0085042312	PCB 5188	7500	85042312	11	10	1	£683.77
0085175211	PCB 5211	7500	85175211	4	2	2	£211.16
0085211712	PCB 5217	7500	85211712	67	16	51	£9,119.37
0085231911	PCB 5218	7500	85231911	9	4	5	£403.29
0085232311	PCB 5219	7500	85232311	2	1	1	£38.42
0085387111	PCB 5232 PART PLATTER	2900	85387111	1	0	1	£24.83
0085411511	PCB 5236 SCAN BD FOR TV	2900	85411511	25	20	5	£3,410.75
0034907039	PCB 5258	2900	34907039	3	3	0	£381.90
0034907086	PCB 5267	2900	34907086	3	1	2	£148.95
0034907155	PCB 5279	2900	34907155	2	1	1	£215.78
0007735592	PCB 532563U	FDS 2500	C16B-5325-0630U	21	14	7	£10,227.84
0007735593	PCB 532564U	FDS 2500	C16B-5325-0640U	9	4	5	£3,532.68
0007755043	PCB 532836	EA3	C16B-5328-0360U	14	0	14	£9,450.56
0007755044	PCB 532837	EA3	C16B-5328-0370U	13	0	13	£6,919.77
0007755046	PCB 550221	EA3	C16B-5502-0210U	4	0	4	£3,325.48
0034902132	PCB 5786	2900	34902132	3	1	2	£265.83
0007961324	PCB 68020 12MHZ PROC	50814288	CSC/2	2	2	0	£3,104.90
0007949354	PCB 68020 30MHZ PROC	50814288		1	0	1	£4,033.90
0005065957	PCB 6976	2903-4 190	5065957	1	0	1	£97.82
0085347012	PCB 6A107	2900	85347012	1	0	1	£44.81
0085492212	PCB 6A122	2900	85492212	1	0	1	£31.01
0007719146	PCB 6SGV INTERLOCK	EDS 80	7719146	18	0	18	£3,240.00
7010997031	PCB 72K 2 IRC VERSION 561	DATAHECKE	7010997031	3	3	0	£215.46
7010997028	PCB 72K PROC FOR 16551012	DATAHECKE	003-010987-028	15	7	8	£1,933.65
0007765074	PCB 8 PORT SERIAL	ANNEX 3	AX3-SPR-S08-160	6	5	1	£1,816.56
0007765076	PCB 8 PORT SERIAL	ANNEX XL	AXM-SPR-SEB-160	25	20	5	£4,089.00
0007757435	PCB 8MB STORE	D50P MOD50	140-10053-00000	10	9	1	£50,531.50
0005139477	PCB 9469	1900	5139477	1	0	1	£120.00

0005135464	PCB 9540	2900	5135464	2	0	2	£14166
0007707491	PCB AAFV	EDS 100	7707491	1	0	0	£40 01
0007707488	PCB AAHV	EDS 100	54092901	1	0	1	£89 25
4901154037	PCB AC POWER CONTROL	1500	4901154037	11	3	8	£3,504 16
7014891000	PCB AC/DC SEQUENCER	DATAHECKE	1120	24	16	8	£2,784 00
7022962000	PCB ADAPTOR M310 ORION	DATAHECKE	13363600A	1	0	1	£72 09
0080060584	PCB ADDRESS GENERATOR	D50P MOD32	140-10010-00003	15	7	8	£39,011 10
0080060573	PCB ADDRESS TRANSLATOR	D50P MOD32	140-01389-00001	16	5	11	£168,101 44
0080060572	PCB ADDRESS TRANSLATOR NO CACHE	D50P MOD24	140-10012-00000	9	5	4	£81,317 97
0007726580	PCB ADVZ FAULT CODE DISPLAY	EDS 80	7726580	7	5	2	£1,073 94
0007729599	PCB AEFX FAULT CONTROL	FDS 160	76935531	18	12	6	£4,179 60
0007729598	PCB AEJX MPX CONTROL	FDS 160	76962329	17	10	7	£11,124 46
0007732038	PCB AGFAX	FDS 160	76933141	46	29	17	£7,259 26
0007707497	PCB AHNV AHPV-MATCHED PAIR	EDS 100	73482301	2	1	1	£805 48
0007727759	PCB AKCX COMP ASSY	FDS 640	76972300	27	18	9	£5,637 60
0007727752	PCB AKDX COMP ASSY	FDS 640	76972701	33	11	22	£10,220 10
0007765042	PCB ALARM	D60 UPS EN	05139061	22	12	10	£6,260 54
0007764253	PCB AMP	ATM	D16B-9723-0501	1	1	0	£55 90
0007712576	PCB AMSV	EDS 200	7712576	1	1	0	£552 48
4902592003	PCB AP 3 FUNCTIONAL STANDARD	D20F AP3	4902592003	36	6	30	£9,012 60
4902592002	PCB AP 3 PIGGYBACK FUNCTIONAL	D20F AP3	4902592002	12	7	5	£3,366 84
4902538001	PCB APPLICATION PROC 2 FUNC	D20P MOD15	4902538001	101	22	79	£14,630 86
7007746004	PCB ART V4 ASYNC WITH 88H2 ROM	DATAHECKE	003-007746-004	97	18	79	£7,215 83
7009867002	PCB ART V5 ASYNC/SYNC + 88H2 ROM	DATAHECKE	003-009867-002	270	44	226	£22,547 70
7009867009	PCB ART V5 ASYNC/SYNC + 88H2 ROM + EXT BUFFER	DATAHECKE	03-009867-009	4	1	3	£109 24
7009867007	PCB ART V5 ASYNC/SYNC + 88J8 ROM	DATAHECKE	003-009867-007	2	0	2	£222 72
0007719149	PCB ASRV	EDS 80	54156100	27	12	15	£3,754 08
4900547163	PCB ASSY BOT/EOT AMP	1500	4900547163	1	0	1	£67 28
0007750496	PCB ASSY DISPLAY STORE AND CONTL MK 2	FDC	7750496	56	22	34	£8,444 80
7019589001	PCB ASSY EXTENDED CMOS MEM 6	DATAHECKE	003-019589-001	115	38	76	£27,878 30
7015690000	PCB ASSY I/F W H SMITH	DATAHECKE	040-015690-000	84	59	25	£9,139 20
7014538047	PCB ASSY NOISE FILTER APEE1720B0	DATAHECKE	7014538047	13	4	9	£1,481 87
0007758644	PCB ASSY OP	9518/200	D860-1160-V230	7	0	7	£18 06
0007754354	PCB ASSY PSU 230V	FDC	7754354	6	1	5	£1,224 96
7010384001	PCB ASYNCH HOST COMMS (DLV 11-E)	DATAHECKE	040-010384-001	5	4	1	£725 80
0007755372	PCB ATNC 3 MIP	D50F ATNC	140-10509-00000	8	4	4	£20,438 48
7980866350	PCB AUXILIARY	DATAHECKE	7980866350	2	2	0	£80 24
0007751318	PCB AVHX READ WRITE	D50F 515MB	54391300	4	4	0	£1,486 72
0007719108	PCB AVTN COMP ASSY	EDS 80	7719108	45	2	43	£8,770 05
0007727722	PCB AVMV COMP ASSY	FDS 640	7727722	3	2	1	£436 77
0007719133	PCB AXFV	EDS 80	75832100	25	16	9	£1,178 25
0007719158	PCB AXVY I/O JUMPER	EDS 80	75838900	3	3	0	£184 10
0007727729	PCB AYMV COMP ASSY	FDS 640	7727729	245	22	223	£49,144 55
0088825101	PCB B101 CPU (SPARC TECHNOLOGY)	D60P CPU25	88825101	4	0	4	£11,244 44
0088825109	PCB B109 LOAD	DRS 6000	88825109	2	0	2	£272 78
0088825112	PCB B112 VMX	D60P VMXCO	88825112	7	0	7	£4,326 48
0088825114	PCB B114 CONTROL BOARD	D60P PROC	88825114	28	23	5	£398 72
0088825115	PCB B115 MVB	D60P MICROL	88825115	11	0	11	£4,928 00
0088825161	PCB B161 CONTROL PANEL DRS6000EL	D60P E/L	88825161	27	24	3	£1,375 38
0005157303	PCB BA76 VSN 3 (HDLC)	D20FPROLV	5157303	5	2	3	£2,046 80
0080043799	PCB BA79 VSN 2 FUNC MDL 50	D20FPROBA7	80043799	36	10	26	£15,026 76
0080043797	PCB BA79 VSN 2 FUNC MOD 30	D20FPROBA7	80043797	11	0	11	£4,411 77
4902468401	PCB BACKBOARD	D20P M128S	4902468401	1	0	1	£53 09
0080061220	PCB BACKPLANE	D40P L7050	80061220	38	33	5	£23,968 50
7980974701	PCB BACKPLANE 14 SLOT	DATAHECKE	9809747-01	1	1	0	£101 17
7011973001	PCB BASE BOARD 2IRC	DATAHECKE	003-011973-001	15	9	6	£961 65
0007734968	PCB BASIC I/O (6 PORT)	D40P MOD25	2CAA07102	117	22	95	£79,075 62
0007759768	PCB BATTERY CHARGER	D60 UPS	A2 72983012	12	0	12	£3,411 96
0007726610	PCB BFFX WRITE PLO	EDS 80	7726610	11	7	4	£1,367 19

0007726616	PCB BHMx	EDS 80	7726616	6	3	3	£1,539.90
0007763736	PCB BILL DISPENSER DRIVER	ATM	D16B-9764-O101/A	6	4	2	£2,631.36
0007731668	PCB BVX	FDS 640	76969502	37	8	29	£10,413.28
0007727753	PCB BVX COMP ASSY	FDS 640	76870701	36	15	21	£7,874.28
0007719142	PCB BLVZ READ PLO	EDS 80	54279303	23	21	2	£4,767.44
0007712577	PCB BMRV	EDS 200	54296103	3	1	2	£633.89
0007765650	PCB BP45AA	9520/303	7765650	20	20	0	£830.80
0007707484	PCB BQZV	EDS 100	54139302	4	1	3	£801.32
0007763799	PCB BSC CARD	ATM 7000	CT-204244001-BROTHER	5	0	5	£1,418.85
0007719148	PCB BSQV	EDS 80	54155701	27	15	12	£4,251.96
7009715001	PCB BUS BOARD FERRO	DATAHECKE	003-009715-001	59	17	42	£6,726.00
7007175001	PCB BUS BOARD STD	DATAHECKE	003-007175-001	87	15	72	£9,918.00
4902422001	PCB BUS CONT FORM(NIF)	D20P M25CO	005-9024220-01	65	12	53	£25,151.10
4901951502	PCB BUS CONTROL	D20P M128S	4901951502	19	9	10	£1,038.92
4902423901	PCB BUS CONTROL	D20V M10VD	4902423901	25	13	12	£2,356.25
4901951501	PCB BUS CONTROL	DRS 20	4901951501	6	5	1	£376.38
0007761903	PCB BUSS	9520/200	D06B-2700-E001	13	13	0	£459.68
4902422002	PCB BUSS CONTRLRFMTTR	D20P LEV 1	4902422002	24	4	20	£7,626.24
0007727769	PCB BVMV REPLACED BY 7728623	FDS 640	7727769	1	0	1	£111.19
0007733680	PCB BVXV	FDS 640	54188501	16	9	7	£2,122.88
0007765041	PCB BYPASS	D60 UPS EN	05138086-11	23	23	0	£4,502.71
0007713641	PCB BZPN PRE AMP	EDS 200	72829610	12	4	8	£4,332.84
0088835501	PCB C501	DRS 6000	88835501	9	6	3	£581.13
3034006852	PCB C852	2900	33406852	1	0	1	£94.47
0007942972	PCB CCC-2	50814/095	7942972	99	94	5	£13,850.10
0007707479	PCB CFUV	EDS 100	7707479	3	2	1	£527.79
0007728964	PCB CGDV COMP ASSY	FDS 640	54231303	24	15	9	£7,494.24
0007726615	PCB CHNX	EDS 80	7726615	10	5	5	£2,810.30
0007949042	PCB CIB	50814/095	E340700000	1	0	1	£207.64
0007727760	PCB CJVX REPL BY BVX 7731668	FDS 640	7727760	8	0	8	£1,490.24
0007719138	PCB CLSV WRITE PLO	EDS 80	54276503	31	14	17	£5,179.17
0007755638	PCB CMC ETHERNET	D50FETHCON	098-10040-00000	17	6	11	£34,670.14
0007757663	PCB CMOS FILESTORE 1MB	9518/200	CA20193-B01X	14	11	3	£5,068.28
7009200000	PCB CMOS MEMORY 2K	DATAHECKE	7009200000	146	42	104	£14,458.38
0007730381	PCB CNSN DIGITAL READ	FDS 160	540866502	19	9	10	£1,665.35
7980973301	PCB CNTRLR JAP 3 EUROPE	DATAHECKE	9809733-01	8	5	3	£185.60
0007961022	PCB COAX INTERFACE M2124-2E	50814/015	1514723000	3	1	2	£2,738.37
0007784153	PCB COLOUR CRT	ATM	B17B-0130-O670AU	12	12	0	£3,405.24
0007739066	PCB COMMS	FDC	490-322	3	2	1	£350.78
0007751055	PCB CONCENTRATOR/BARRIER	FDC	7751055	11	3	8	£5,614.40
0080060582	PCB CONTROL	D50P MOD32	140-01383-00001	14	8	6	£23,021.32
0007764390	PCB CONTROL	D60 UPS	76304002	7	0	7	£3,151.05
0007764959	PCB CONTROL	D60 UPS SL	61702152	14	2	12	£2,233.14
4902483701	PCB CONTROL IBC II	D20P LEV 1	4902483701	1	0	1	£131.88
7980945051	PCB CONTROL JAP INVERTOR	DATAHECKE	9809450-51	5	4	1	£101.65
7241185100	PCB CONTROL LOGIC 2 - 3651	DATAHECKE	7241185100	1	1	0	£253.50
0007719623	PCB CONTROL PANEL	7500	95440301	4	4	0	£69.40
0007751185	PCB CONTROL PANEL	D50P MOD32	080-00302-00000	1	1	0	£123.78
7980236551	PCB CONTROL PANEL	DATAHECKE	9802365-51	1	1	0	£52.35
0007759977	PCB CONTROL PANEL	9518/200	D16B-9672-0432	4	0	4	£1,013.08
7852460900	PCB CONTROL STORAGE A2-E2	DATAHECKE	7852460900	1	1	0	£72.00
7852805500	PCB CONTROL STORAGE A2-F2	DATAHECKE	7852805500	1	1	0	£92.25
0007961026	PCB CONTROL TIME TERMINAL	50814/250	2/ROA1198422	6	4	2	£2,131.92
4901731101	PCB CONTROLLER	1500	4901731101	2	0	2	£273.16
0007719169	PCB CONTROLLER	COMMS SYST	7719169	10	0	10	£4,338.60
0007765029	PCB CONTROLLER	D60 UPS EN	05138889-2	19	11	8	£8,046.50
0007961390	PCB CONTROLLER E17	50814/056	KDY1980940	15	10	5	£7,676.40
0080061500	PCB CONTROLLER FOR DISK OPTICAL 5 1/4"	D60DOPTICA	80061500	18	8	10	£8,262.72
0007719493	PCB CONTROLLER HD	7500	95440136	18	0	18	£24,589.52

7009706001	PCB CONTROLLER K/BD DISPLAY	DATAHECKE	003-009706-001	8	0	8	£1,536.00
7020956500	PCB CONTROLLER KYBD DISPLAY	DATAHECKE	003-020956-500	2	1	1	£312.78
7980984451	PCB CONTROLLER MICRO DISPLAY	DATAHECKE	9809844-51	27	10	17	£592.92
0080192281	PCB CONTROLLER REL 1 V2	9520/150	80192281	52	20	32	£211.12
0080155038	PCB CONTROLLER REL 1V1	9520/150	80155038	22	11	11	£8,574.72
0007949034	PCB CPB	50814/095	7949034	123	123	0	£4,241.04
0007943130	PCB CPG	50814/044	7943130	80	39	41	£19,240.00
0007846649	PCB CPG-8	50814/044	8188-0001	11	9	2	£1,882.65
0080060571	PCB CPU-2	D50P MOD32	140-01449-00012	22	7	15	£31,090.40
0007734972	PCB CPU 10MHZ PICK VERS	D40P MOD25	7734972	1	0	1	£398.92
7014502000	PCB CPU 11/23	DATAHECKE	040-014502-000	11	9	2	£10,050.04
7015268000	PCB CPU 11-73 MODEL 1120 1125	DATAHECKE	040-015268-000	28	18	10	£33,454.40
7015211014	PCB CPU 136K WITH EPROM	DATAHECKE	003-015211-014	6	1	5	£500.94
0007754763	PCB CPU 68020 WITH CACHE	D40P MOD24	070AAA3402	194	17	177	£472,021.40
0007754994	PCB CPU 68020 WITHOUT CACHE	D40P MOD23	070AAA3412	8	5	3	£13,336.96
0080061498	PCB CPU 68030 CACHELESS	D40P L6650	070AAA6802	24	6	18	£63,253.44
0007755468	PCB CPU BACKPLANE	D50P OSCAR	145-10020-00001	2	2	0	£19,764.00
7010352001	PCB CPU BUSS 2 IRC SDC D	DATAHECKE	003-010352-001	32	11	21	£4,219.20
0007961012	PCB CPU DS SAAB E18	50814/013	15117740-20	6	5	1	£2,281.98
7015211000	PCB CPU NO EPROMS	DATAHECKE	003-015211-000	323	83	240	£14,354.12
0007926931	PCB CPU OLD VERSION E17	50814/020	55368647-00	8	6	2	£1,836.96
7000000072	PCB CPU PROCESSOR VER 521	DATAHECKE	7000000072	2	2	0	£271.64
0007739931	PCB CPU UNIX VERSION FOR REL3 MACHINES	D40P MOD45	070AAA1801	5	2	3	£5,361.80
7000000059	PCB CPU VER 516 48K	DATAHECKE	7000000059	29	22	7	£1,988.24
7000000065	PCB CPU VER 520 72K	DATAHECKE	7000000065	9	9	0	£646.38
7000000063	PCB CPU VER 571 72K	DATAHECKE	7000000063	2	2	0	£143.64
7000000069	PCB CPU/PSU VER 520	DATAHECKE	7000000069	1	0	1	£135.82
7000000071	PCB CPU/PSU VER 571	DATAHECKE	7000000071	2	2	0	£271.64
0007943049	PCB CRB	50814/045	7943049	60	52	8	£4,545.60
0007961912	PCB CRB	50814/095	E341110000	70	67	3	£17,500.00
0007768462	PCB CRM OPTO SENSOR FOR FDP20	FDP20	A9926683	5	5	0	£74.20
4902040501	PCB CRT CONT (SOFT)	DRS 20	4902040501	1	0	1	£171.13
0007751302	PCB CSVX MOTHER BOARD	D50F 340 M	54366902	5	5	0	£796.70
0007761890	PCB CUSTOMER DISPLAY	9520/200	D16L-8349-0235	18	0	18	£2,012.22
0007732133	PCB CVWV	FDS 640	7732133	38	20	18	£11,920.98
0007719134	PCB CXKV	EDS 80	7719134	5	0	5	£978.65
0007727200	PCB CZSV POWER AMPLIFIER	EDS 80	7727200	3	1	2	£86.28
0088836501	PCB D501 FOREIGN PERIPHERAL INTERFACE OPTION	9520/150	88836501	3	3	0	£441.63
0088836522	PCB D522 REL 3 INTELLIGENT TEE	9520/150	88836522	25	25	0	£6,717.75
0007942736	PCB DA	50814/095		11	11	0	£255.09
4900547691	PCB DATA E19	1500	4900547691	1	0	1	£88.16
0007756491	PCB DATA FORMAT	D3M MTU	X111301	1	1	0	£72.14
0080060583	PCB DATA LOOP	D50P MOD32	140-01381-00002	10	8	2	£15,715.30
0007724420	PCB DATA RECOVERY	1500	7772150	2	0	2	£366.58
4902644401	PCB DAUGHTER AP3 MEMORY EXPANSION	D3V AP3 ME	677934	8	3	5	£924.56
0007751191	PCB DAUGHTER BOARD	D50F ASYNC	145-01333-00000	3	2	1	£1,082.25
7010107004	PCB DAUGHTER BOARD 32K HIGH DENSITY EDAC	DATAHECKE	003-010107-004	10	8	2	£832.70
0007769306	PCB DBU-2 GDC	B&Q	GDC064P003001	4	0	4	£0.04
0007759770	PCB DC CAP AP130	D60 UPS	76112002	6	6	0	£1,331.28
0007943110	PCB DCA-PB	50814/046	7943110	3	2	1	£236.04
0007712568	PCB DFLV	EDS 200	54224107	2	1	1	£477.24
0007728622	PCB DHMX	FDS 640	76956704	24	17	7	£6,382.08
0007727761	PCB DHNX COMP ASSY	FDS 640	7727761	5	3	2	£811.20
7014880000	PCB DIAGNOSTIC DISPLAY	DATAHECKE	003-014880-000	26	13	13	£314.08
0080061047	PCB DISC CONTROLLER	D50P MOD50	140-10050-00000	17	8	9	£35,742.50
7000000025	PCB DISC CONTROLLER OMITI 5400	DATAHECKE	M1100 U-933	54	16	38	£10,368.00
0007946480	PCB DISPLAY	50814/064	7946480	3	0	3	£34.80
0007765308	PCB DISPLAY	D60T EXABY	782801	3	3	0	£359.07
0007766906	PCB DISPLAY FRONT RIGHT FOR FDP20	FDP20	A9926681	1	0	1	£21.10

0007962342	PCB DISPLAY PROC B GENERAL	50814/211	ROF1976241/2	2	2	0	£397.56
0007723763	PCB DISPLAY STORE & CONT	FDC	7723763	6	0	6	£608.64
0007730657	PCB DJSX COMP ASSY	FDS 640	76968304	20	18	2	£3,983.40
0007732134	PCB DKAX	FDS 640	76971503	51	22	29	£13,138.62
0007730659	PCB DLEX COMP ASSY	FDS 640	7730659	1	0	1	£238.84
0007727754	PCB DLGX	FDS 640	7727754	1	0	1	£464.97
0007719154	PCB DPEV	EDS 80	54121705	27	15	12	£3,415.50
0007962222	PCB DPG	50814/038	2/ROF1976209	25	22	3	£3,745.75
0007924375	PCB DPG-B (ALFA) E17	50814/049	7924375	83	8	75	£22,459.80
0007940326	PCB DPG (972W)	50814/090	7940326	33	24	9	£6,192.78
0007940335	PCB DPG (A320E/G)	50814/087	AC42520	6	4	2	£792.72
0007946637	PCB DPG (ALFA)	50814/060	ROF1976249/1	60	60	0	£9,507.00
0007961447	PCB DPG (ASCII FTZ)	50814/060	ROF1976250/2	2	2	0	£257.64
0007961517	PCB DPG (SS3-BETA) E17	50814/211	2/ROA1195303	78	77	1	£1,637.22
0007946647	PCB DPG BOARD	50814/095	7946647	60	51	9	£6,976.80
0007727607	PCB DRC	1500	350-066-503	1	1	0	£17.17
0007755041	PCB DRIVE SEQUENCER UNIT	EA3	B14L-5105-E024A	4	0	4	£3,818.00
7980910551	PCB DRIVER DISPLAY ALPHA	DATA CHECK	9809105-51	59	4	55	£3,652.10
0007949479	PCB DRIVER DV05AB	50814/290	D16B-9607-0802	1	0	1	£5.47
7003675001	PCB DRIVER SLIP PRINTER	DATA CHECKE	003-003675-001	38	24	14	£432.82
0007934753	PCB DT11 1WT-50434; CONTROL E18	50814/095	50814/095	3	3	0	£588.83
0007961636	PCB DTC-A	50814/095	E340620001	3	3	0	£472.32
0007961637	PCB DTC-B E17	50814/095	E340620100	97	81	16	£16,502.52
0007942951	PCB DTC-B	50814/095	E340620110	358	180	178	£61,404.16
0007934980	PCB DTDH 2WQ-85108 E18	50814/095	7934980	4	3	1	£704.52
0007961093	PCB DTMC, CONTROL E18	50814/095	71500801	3	3	0	£1,951.11
0007961096	PCB DTML E18	50814/095	71503805	7	5	2	£1,779.12
0007934755	PCB DTSB E21	50814/095	71500804	29	23	6	£3,815.53
0007934981	PCB DTSC, SER INTERFACE E17	50814/095	7934981	21	18	3	£3,436.65
4901936701	PCB DUAL PORT MEM 32K	DRS 20	005-9019367-01	6	4	2	£645.54
4901936702	PCB DUAL PORT MEMORY 64K	DRS 20	005-9019367-02	5	5	0	£641.00
7010191001	PCB DUV 11	DATA CHECKE	040-010191-001	15	10	5	£21,016.20
0007728623	PCB DVM	FDS 640	54184503	26	17	9	£4,305.60
7980945252	PCB DYNAMIC MEMORY 512K	DATA CHECK	9809452-52	2	0	2	£383.24
0007726617	PCB DZV	EDS 80	7726617	2	0	2	£345.00
0007764951	PCB EM1	D60 UPS SL	61702105	1	0	1	£71.35
7010107001	PCB EDAC DAUGHTER BD 8K	DATA CHECK	7010107001	1	0	1	£32.51
0007763747	PCB EDU01B	FSA	D16B-9687-0601/11	1	1	0	£343.11
0007726611	PCB EFEX	EDS 80	76934705	16	1	15	£2,178.56
7980202151	PCB EIA CONNECTOR MODULE	DATA CHECK	9802021-51	2	0	2	£44.72
0007719144	PCB ELUV ACCESS	EDS 80	7719144	30	7	23	£5,344.20
0080060576	PCB ENCHANGED DISC CONTROLLER	D50F CONTR	80060576	19	13	6	£38,041.04
0007961389	PCB ENGINE DRIVE E19	50814/056		7	6	1	£1,785.77
7015211004	PCB EPROM CPU M545 V1 1	DATA CHECKE	003-015211-004	22	6	16	£1,752.74
4902046501	PCB ES10	DRS 20	4902046501	4	2	2	£812.00
0080060577	PCB ESDI PANEL	D50P OSCAR	140-10022-00003	15	9	6	£11,053.80
0007751309	PCB ESXW MOTOR SPEED & POWER AMP	D50F 340 M	54367304	7	5	2	£1,568.75
0007755950	PCB ETHERNET EMP10+	D40PETHCON	7755950	3	2	1	£2,670.54
0007719152	PCB ETV SECTOR	EDS 80	54276906	36	19	17	£4,288.68
0007751308	PCB EUGX READ WRITE	D50F 340 M	54381309	9	1	8	£3,162.51
7014285006	PCB EUR ASSY APEE1640ED	DATA CHECK	049-014285-006	2	0	2	£137.52
0007731896	PCB EXKV	EDS 80	75833708	329	8	321	£70,838.98
7010735012	PCB EXP MEMORY SYST 32K	DATA CHECK	003-010735-012	7	6	1	£1,300.74
7010735010	PCB EXP MEMORY SYST 8K	DATA CHECK	003-010735-010	4	4	0	£367.44
0007734975	PCB EXPANDED I/O	D40F EXI/O	2CAA07201	191	3	188	£145,564.92
7980980851	PCB EXPANSION COMM PORT	DATA CHECK	9809808-51	1	0	1	£57.96
0007758287	PCB EXSP ENHANCED DISC CONTROLLER	D40P L7050	070AAB1101	67	0	67	£59,446.42
0007730070	PCB EXT (NOW WITHDRAWN)	EDS 80 FIR	7730070	1	0	1	£88.85
7019589000	PCB EXTENDED CMOS 1/2 HT 4K	DATA CHECKE	003-019589-000	69	47	42	£2,387.87

7011461000	PCB EXTENDED CMOS 2K	DATACHECKE	003-011461-000	42	8	34	£4,415.46
7015441005	PCB EXTENDED CMOS 48K	DATACHECKE	003-015441-005	1	1	0	£23.20
7015441007	PCB EXTENDED CMOS 64K	DATACHECKE	003-015441-007	1	0	1	£252.86
7019574003	PCB EXTENDED CMOS 64K SINGLE BD	DATACHECKE	7019574003	3	3	0	£332.79
0007730250	PCB EYUV	FDS 640	7730250	2	0	2	£499.86
0007727278	PCB EYUV REPL BY JYV 7732798	FDS 640	7727278	7	2	5	£1,775.90
0007719156	PCB EZKN WRITER	EDS 80	7719156	36	4	32	£7,718.76
0007760099	PCB FAN FAILURE LOWER	D60 UPS	72985022	26	9	17	£748.28
0007760098	PCB FAN FAILURE UPPER	D60 UPS	72985012	43	28	14	£1,241.84
7980202951	PCB FAST RAM C1700	DATACHECK	7980202951	11	5	6	£255.20
7021222501	PCB FASTRAM II 512K	DATACHECK	003-021222-501	26	17	9	£9,492.08
0088835503	PCB FDDI HSI I/F C503	D600FDDI/	88835503	7	0	7	£16,951.34
0007842975	PCB FDPL	50814095	E340760000	23	20	3	£4,852.54
0007862029	PCB FDPL	50814095	E340760010	10	9	1	£349.10
0080061963	PCB FEP FJ4W	9520/200	19273001	6	4	2	£779.52
0007733184	PCB FEPI/C03 V300-034-051	D88F CWPEN	7733184	15	9	6	£11,249.10
0007734141	PCB FHNX COMP ASSY	FDS 640	76957112	38	21	17	£10,252.78
4902510901	PCB FIX/FLOPPY CONTROLLER N/F	D20F MOD12	676315	24	14	10	£6,141.84
0080061965	PCB FJ4W WIRE ADAPTOR	9520/200	10558001	16	14	2	£1,262.08
0007719140	PCB FKFV FAULT	EDS 80	54262108	29	17	12	£5,775.64
7980214700	PCB FLAT SCANNER FATHER BOARD	DATACHECKE	7980214700	1	0	1	£434.21
0007731813	PCB FLEX	FDS 640	7731813	40	19	21	£8,255.20
4901997902	PCB FLEXI DISC CONT	D20P MOD50	005-9019979-02	19	14	5	£4,336.18
0007729543	PCB FLHX REPL BY HLX 7733326	FDS 640	7729543	1	0	1	£177.40
0007770739	PCB FLM90AA SENSOR FOR 10" CRT ON LANDMARK	ATMLANDMAR	CA20171 B40X	6	6	0	£207.42
0080060634	PCB FLOATING POINT PROCESSOR A	D50F MATH	140-10005-00007	4	4	0	£10,948.52
0007751224	PCB FLOATING POINT PROCESSOR B	D50F MATH	140-10006-00002	10	3	7	£25,265.70
7980214551	PCB FLOPPY SERIAL CONTROL	DATACHECK	7980214551	39	23	16	£5,270.85
0080060902	PCB FLOPPY/CMT CONTROLLER	D40D FLOPP	070AAA8101	36	15	21	£13,864.32
0007719145	PCB FLPV SWITCHER	EDS 80	7719145	35	7	28	£17,450.65
0007719150	PCB FLWW DIFF GEN	EDS 80	54278107	21	13	8	£2,346.75
0007719151	PCB FLXV NRZ/MFM	EDS 80	54278508	22	17	5	£2,458.50
0007961008	PCB FMA	50814013	15110360-40	9	4	5	£748.35
7011382000	PCB FOLIO PRINTER I/F	DATACHECKE	003-011382-000	20	13	7	£939.00
0007764901	PCB FOR CRT UNIT	ATM	B17B-0130-0680AU	10	9	1	£2,837.70
0007940093	PCB FOR KEYBOARD ATC 186/256 (AC09888A24)	50814/255	AC09888 24	25	23	2	£2,128.25
0080019998	PCB FORMATTER	D3D MOD D2	80019998	21	4	17	£3,569.16
0080060100	PCB FORMATTER	D3D MOD D3	ABC400	59	4	55	£7,652.30
0080060946	PCB FORMATTER (TORCH MANTA)	DRS 300	80060946	19	1	18	£1,538.43
4902408801	PCB FORMATTER (N/F)	D20P MOD50	4902408801	59	2	57	£17,463.41
0080019966	PCB FORMATTER S1401	DRS 300	80019966	30	7	23	£2,501.40
4902421806	PCB FORMATTER/BUS CNTLR 5 25IN DISC FUNC	D20P M155L	4902421806	8	7	1	£3,913.60
4902577601	PCB FP BUS CNTRL/FMTR FUNC RFI	D20PM125DS	4902577601	7	5	2	£2,454.20
0007755882	PCB FSC MODULE	D50F MTU	7755882	2	0	2	£428.50
7980968851	PCB FSC CONTROLLER	DATACHECK	9809688-51	25	18	7	£580.00
4901982301	PCB FSF CONTROLLER	FLEXI DISC	4901982301	37	24	13	£11,804.11
0007719147	PCB FTHV	EDS 80	54162911	24	13	11	£4,287.36
4902513001	PCB FUNCTIONAL	D20FMSR	4902513001	7	7	0	£491.12
0080036239	PCB FUNCTIONAL ASSY	DRS 20 M30	80036239	95	1	94	£15,844.10
0007751306	PCB FVCX CONTROL	D50F 340 M	54369334	5	4	1	£2,746.00
0007712572	PCB FWZV	EDS 200	54199310	2	1	1	£429.60
4902402901	PCB FXFLPY CONT (N/F)	D20P M25CO	4902402901	53	9	44	£20,382.21
0007734970	PCB FXD DISC CNTRLR	D40P MOD25	2CAAA07701	8	5	3	£3,341.68
0007719157	PCB FZON SERVO PRE AMP	EDS 80	73485311	36	18	18	£5,146.56
0034907125	PCB G049	2800	34907125	2	0	2	£112.98
0034901235	PCB G235	ESS	34901235	1	1	0	£1,213.28
0034901243	PCB G243	ESSEX	34901243	1	1	0	£97.22
0034801251	PCB G251	ESSEX	34901251	1	0	1	£263.30
0034901253	PCB G253	ESSEX	34901253	3	0	3	£313.17

0034901254	PCB G254	ESSEX	34901254	1	1	0	£20 91
0034901259	PCB G259 CONTROL LIST	ESS	34901259	1	0	£77 23	
0034901261	PCB G261	ESS	34901261	2	2	£381 24	
0034901264	PCB G264	ESS	34901264	1	0	£243 19	
0034901286	PCB G286	FD2	34901286	5	2	£15,023 40	
0034901287	PCB G287	FD2	34901287	6	3	£3,752 70	
0034901288	PCB G288	FD2	34901288	20	0	£23,932 20	
0034901320	PCB G320	ESSEX	34901320	1	0	£89 75	
0034901327	PCB G327	FD2	34901327	5	2	£1,137 80	
0034901339	PCB G339	FD2	34901339	7	6	£974 61	
0088804402	PCB G402 DC CONVERTER	D20P M35CT	88804402	10	4	£1,834 40	
0088804410	PCB G410 CAFS TIE OFF	2900 DDC	88804410	8	5	£727 36	
0088804411	PCB G411 CAFS TIE OFF	2900 DDC	88804411	17	5	£372 13	
0088804433	PCB G433	ESSEX	88804433	3	2	£488 85	
0088804434	PCB G434	ESSEX	88804434	1	0	£163 68	
0088804449	PCB G449	2900	88804449	5	0	£458 20	
0085558511	PCB G502	2900	85558511	1	0	£18 17	
0085726621	PCB G525	2903TAPE	85726621	12	6	£1,905 60	
0085726611	PCB G525 SEQUENCE CONTROL	2903TAPE	85726611	2	1	£254 00	
0085819711	PCB G538	2900	85819711	1	0	£33 15	
0085617511	PCB G541	2900	85617511	1	0	£48 39	
0085617611	PCB G542	2900	85617611	1	0	£48 40	
0085617711	PCB G543	2900	85617711	1	0	£83 54	
0085875711	PCB G556	2900 O STA	85875711	1	0	£27 27	
0088800615	PCB G615	2900	88800615	2	1	£212 92	
0088800619	PCB G619	2903 - 4	88800619	13	0	£2,473 51	
0088800620	PCB G620	2903 - 4	88800620	1	0	£34 50	
0088800621	PCB G621 UNDERVOLT SENSE	2903 - 4	88800621	3	2	£88 08	
0088800622	PCB G622 DISPLAY FIRST FAIL	2903 - 4	88800622	1	0	£25 30	
0088800623	PCB G623 SEQUENCE	2903 - 4	88800623	2	0	£51 20	
0088800624	PCB G624 UNDEROVER VOLT PTN	2903 - 4	88800624	3	0	£88 41	
0088800626	PCB G626 GO & RESET	2903 - 4	88800626	4	2	£109 00	
0088800627	PCB G627 ON DRIVE	2903 - 4	88800627	1	0	£31 52	
0088800628	PCB G628 INTERFACE LOCAL/REM	2903 - 4	88800628	1	0	£29 47	
0088800639	PCB G639 UNDERVOLT SENSE LINK	2903 - 4	88800639	1	0	£40 12	
0088800659	PCB G659 V3	7500	88800659	105	90	£1,312 50	
0088800660	PCB G660 V2	7500	88800660	72	64	£1,780 56	
0088800714	PCB G714 DIAGNOSTIC CARD FOR CSM1	2900	88800714	2	2	£38 92	
0088800723	PCB G723	D20F M16VD	88800723	22	16	£4,356 00	
0088800725	PCB G725 VIDEO I/F	DRS 20 M30	88800725	42	8	£10,782 66	
0088800726	PCB G726 SLAVE VIDEO	D20V M6 VD	88800726	26	10	£1,538 68	
0088800727	PCB G727 COMMS CPLR	DRS 20 M30	ZP1100	68	15	£1,786 36	
0088800728	PCB G728 PSU	D20V M6 VD	88800728	189	7	£17,480 61	
0088800729	PCB G729	DRS 20 M30	88800729	15	9	£589 80	
0088800740	PCB G740	EDS 80	88800740	1	0	£44 74	
0088800758	PCB G758 CTL PANEL	DRS 20 M30	88800758	3	0	£92 94	
0088800798	PCB G798 PSU 30A	D20P M35CT	88800798	17	10	£6,902 00	
0088800799	PCB G799	DRS 20	88800799	18	6	£4,432 14	
0088800800	PCB G800	D20F M16VD	88800800	24	5	£3,792 96	
0088800808	PCB G808	DRS 20	88800808	21	16	£2,751 63	
0088800813	PCB G813	D20F M16VD	88800813	3	0	£908 37	
0080043089	PCB G815 FUNCTIONAL	DEFC	80043089	23	12	£8,682 96	
0088800841	PCB G841 CTL PANEL	DRS 20 M30	88800841	25	14	£849 50	
0088800842	PCB G842	2900	88800842	1	0	£139 20	
0086017297	PCB G854 I/F	DEFC	86017297	5	3	£1,421 75	
0080036290	PCB G864 FUNCTIONAL	DRS 20	80036290	21	2	£19,925 43	
0088800880	PCB G880 (RECLAIM ONLY)	2900 CAFS	88800880	1	0	£391 47	
0080042973	PCB G889 DISK CNTRL FUNC	D20F 128S	80042973	27	17	£8,590 05	
0007726608	PCB GFBX	EDS 80	76933511	19	11	£2,857 98	

0007730249	PCB GJTX COMP ASSY	FDS 840	76968708	29	20	9	£5,468.53
0007726578	PCB GNQN, BUT USE 7728604	EDS 80	7726578	2	1	1	£294.74
0007943085	PCB GPB	50814/085	7943085	7	3	4	£931.84
7022831000	PCB GPIO TOP LEVEL	DATAHECKE	001-022831-000	80	38	42	£5,608.80
0035209503	PCB H503 DCI FANOUT	GOLDRUSH	35209503	1	1	0	£238.96
7014387000	PCB HANDISCAN I/F M500	DATAHECKE	003-014387-000	6	3	3	£793.44
0007730069	PCB HD ALIGN (NOW WITHDRAWN)	FDS 160	7730069	2	0	2	£810.04
7980938351	PCB HDC SEQUENCER	DATAHECKE	9809383-51	20	13	7	£464.00
7980865001	PCB HDC Z80 LOGIC C.1700	DATAHECKE	7980865001	25	20	5	£2,395.00
0007719139	PCB HFRV SERVO	EDS 80	54226113	31	16	15	£6,905.87
0007733326	PCB HLHX	FDS 640	54304111	30	15	15	£5,222.70
0007726577	PCB HNRN	EDS 80	54086107	19	9	10	£4,318.13
0007719494	PCB HORIZ TRANSDUCER	7500	44670303	12	6	6	£1,757.64
7014504000	PCB HOST ADAPTOR	DATAHECKE	040-014504-000	36	17	19	£7,379.28
7014504001	PCB HOST ADAPTOR DTC11-2	DATAHECKE	040-014504-001	2	2	0	£409.76
0007732135	PCB HVLV	FDS 640	54164109	29	7	22	£14,654.28
0007722125	PCB I/F	7500	7722125	2	0	2	£408.28
4902086701	PCB I/F	D20P M20DS	4902086701	2	1	1	£161.96
4902442901	PCB I/F	D20P M20DS	4902442901	16	10	6	£2,472.32
0007727568	PCB I/F ADAPTOR CARD	FDC	52502	3	2	1	£99.66
0007727050	PCB I/F MDIOC TYPD	DATAHECKE	7727050	10	1	9	£766.10
7014538006	PCB I/F SLIP PRINTER	DATAHECKE	049-014538-006	40	19	21	£1,613.20
7009731001	PCB I/O	DATAHECKE	003-009731-001	11	6	5	£280.62
7007632015	PCB I/O BD 50 HZ FERRO M515/520	DATAHECKE	003-007632-015	58	37	21	£11,923.06
7007206001	PCB I/O BD 515	DATAHECKE	003-007206-001	3	3	0	£150.00
7007632011	PCB I/O BD UNIVERSAL	DATAHECKE	003-007632-011	253	3	250	£48,576.00
0090061567	PCB I/O CONTROLLER ADVANCED	D40PIOCON	070AAB1801	20	0	20	£6,960.00
7009038002	PCB I/O DISPLAY	DATAHECKE	003-009038-002	31	9	22	£1,580.07
0007769635	PCB I/O FLM10CA	ATMLANDMAR	CA20205-B10X	3	0	3	£660.00
0007761906	PCB I/O I1098XX	9520/200	D06B-5510-D201	51	5	46	£18,857.76
7007632002	PCB I/O NON-FERRO 60HZ	DATAHECKE	003-007632-002	1	0	1	£63.49
7010950006	PCB I/O WITH DISPLAY 50HZ 23/13 FOR M500	DATAHECKE	003-010950-006	134	0	134	£11,365.88
7010950005	PCB I/O WITH DISPLAY 50HZ 51 FOR M500	DATAHECKE	003-010950-005	159	4	155	£16,589.60
0007763707	PCB I/O WITH ROM I098JB	9520/300	D06B-9697-O301	22	19	3	£10,803.10
0007759771	PCB I/P TX TERMINALS	D60 UPS	76114002	50	50	0	£6,690.50
0042003140	PCB IBC/RTC (COMMUNITY MNGT)	D20FCOMMA	42003140	10	0	10	£2,586.30
4902040504	PCB IBI CRT CONT	D20P M20DS	676655	31	13	18	£6,517.75
4902040503	PCB IBI CRT WKSTN PROC	D20P M20DS	4902040503	52	16	36	£12,357.28
0007763745	PCB IC98BB	ATM 7000	D16B-9677-O601	5	3	2	£1,504.85
0007769461	PCB ICP 5 ICP22AA	ATMLANDMAR	CA20184-B01X	3	3	0	£558.39
0007760459	PCB INDICATOR 60HZ	D601 UPS	72921022	1	0	1	£43.02
0007759762	PCB INDICATOR AP10S	D60 UPS	72921002	1	0	1	£48.80
7020674000	PCB INDICATOR HARNESS ASSY	DATAHECKE	003-020674-000	17	17	0	£115.08
0080060581	PCB INSTRUCTION PROCESSOR	D50P MOD32	140-01391-00005	40	6	34	£67,781.60
0007940178	PCB INVERTER BOARD	50814/236		2	2	0	£97.58
7980214353	PCB IOHCC	DATAHECKE	9802143-53	18	10	8	£2,755.08
7980222151	PCB IPU FAST LOGIC C.1700	DATAHECKE	7980222151	14	7	7	£1,824.34
7004426002	PCB IRC	DATAHECKE	003-004426-002	42	33	9	£974.40
7004426001	PCB IRC 200/400 SERIES	DATAHECKE	7004426001	16	15	1	£800.00
7014495000	PCB IRC I/F	DATAHECKE	003-014495-000	12	10	2	£256.68
7980230000	PCB IRC INTERFACE SC600	DATAHECKE	9802300-00	8	4	4	£327.36
0007769636	PCB ISARAM FLM30CA	ATMLANDMAR	CA20205-B20X	3	3	0	£540.00
0035206144	PCB J144	2900	35206144	1	0	1	£120.00
0035206177	PCB J177	2900	35206177	6	2	4	£720.00
0035206244	PCB J244	2900	35206244	4	1	3	£480.00
0035206344	PCB J344	2900	35206344	1	0	1	£120.00
0035206701	PCB J701	2900	35206701	8	6	2	£960.00
0035206702	PCB J702	2900	35206702	3	2	1	£360.00
2235206702	PCB J702 (BL2)	2900	2235206702	3	1	2	£360.00

PCB

0035206703	PCB J703	2900	36206703	9	5	4	£1,080.00
0035206704	PCB J704	2900	35206704	8	6	2	£960.00
0035206705	PCB J705	2900	35206705	8	4	4	£960.00
0035206706	PCB J706	2900	35206706	19	13	6	£2,280.00
0035206707	PCB J707	2900	35206707	5	2	3	£600.00
0035206708	PCB J708	2900	35206708	3	1	2	£360.00
0035206709	PCB J709	2900	35206709	4	1	3	£480.00
0035206710	PCB J710	2900	35206710	6	4	2	£720.00
0035206711	PCB J711	2900	35206711	6	3	3	£720.00
0035206712	PCB J712	2900	35206712	1	1	0	£326.26
0035206713	PCB J713	2900	35206713	7	2	5	£1,538.04
0035206714	PCB J714	2900	35206714	9	4	5	£1,080.00
0035206715	PCB J715	2900	35206715	9	4	5	£1,080.00
2235206715	PCB J715 (BL2)	2900	35206715	9	4	5	£1,080.00
0035206716	PCB J716	2900	35206716	9	4	5	£360.00
0035206717	PCB J717	2900	35206717	3	1	2	£480.00
0035206718	PCB J718	2900	35206718	4	1	3	£480.00
2235206718	PCB J718 (BL2)	2900	35206718	4	1	3	£120.00
0035206719	PCB J719	2900	35206719	1	0	1	£240.00
2235206719	PCB J719 (BL2)	2900	35206719	2	1	1	£360.00
0035206720	PCB J720	2900	35206720	3	2	1	£720.00
2235206720	PCB J720 (BL2)	2900	35206720	6	3	3	£720.00
0035206721	PCB J721	2900	35206721	6	3	2	£240.00
2235206721	PCB J721 (BL2)	2900	35206721	2	0	0	£240.00
0035206722	PCB J722	2900	35206722	6	3	3	£720.00
0035206723	PCB J723	2900	35206723	2	0	2	£240.00
0035206724	PCB J724	2900	35206724	11	7	4	£1,320.00
0035206725	PCB J725	2900	35206725	4	1	3	£480.00
2235206725	PCB J725 (BL2)	2900	35206725	7	1	6	£840.00
0035206726	PCB J726	2900	35206726	7	1	5	£840.00
2235206726	PCB J726 (BL2)	2900	35206726	7	1	5	£840.00
0035206727	PCB J727	2900	35206727	7	2	2	£480.00
2235206727	PCB J727 (BL2)	2900	35206727	4	2	2	£480.00
0035206728	PCB J728	2900	35206728	4	2	2	£671.38
2235206728	PCB J728 (BL2)	2900	35206728	2	0	2	£139.20
0035206729	PCB J729	2900	35206729	2	1	0	£877.92
2235206729	PCB J729 (BL2)	2900	35206729	3	1	2	£120.00
0035206730	PCB J730	2900	35206730	1	0	1	£360.00
2235206730	PCB J730 (BL2)	2900	35206730	1	0	1	£360.00
0035206731	PCB J731	2900	35206731	2	1	1	£671.38
2235206731	PCB J731 (BL2)	2900	35206731	2	1	1	£139.20
0035206732	PCB J732	2900	35206732	3	2	2	£877.92
2235206732	PCB J732 (BL2)	2900	35206732	3	2	2	£120.00
0035206733	PCB J733	2900	35206733	1	0	1	£360.00
2235206733	PCB J733 (BL2)	2900	35206733	1	0	1	£360.00
0035206734	PCB J734	2900	35206734	3	2	2	£960.00
2235206734	PCB J734 (BL2)	2900	35206734	3	2	2	£960.00
0035206735	PCB J735	2900	35206735	4	1	1	£120.00
2235206735	PCB J735 (BL2)	2900	35206735	4	1	1	£120.00
0035206736	PCB J736	2900	35206736	7	1	1	£360.00
2235206736	PCB J736 (BL2)	2900	35206736	7	1	1	£360.00
0035206737	PCB J737	2900	35206737	7	2	2	£671.38
2235206737	PCB J737 (BL2)	2900	35206737	4	2	2	£139.20
0035206738	PCB J738	2900	35206738	4	2	2	£877.92
2235206738	PCB J738 (BL2)	2900	35206738	4	2	2	£120.00
0035206739	PCB J739	2900	35206739	2	0	2	£360.00
2235206739	PCB J739 (BL2)	2900	35206739	2	0	2	£360.00
0035206740	PCB J740	2900	35206740	2	0	2	£671.38
2235206740	PCB J740 (BL2)	2900	35206740	2	0	2	£139.20
0035206741	PCB J741	2900	35206741	1	1	0	£877.92
2235206741	PCB J741 (BL2)	2900	35206741	1	1	0	£120.00
0035206742	PCB J742	2900	35206742	3	1	1	£360.00
2235206742	PCB J742 (BL2)	2900	35206742	3	1	1	£360.00
0035206743	PCB J743	2900	35206743	1	0	1	£120.00
2235206743	PCB J743 (BL2)	2900	35206743	1	0	1	£120.00
0035206744	PCB J744	2900	35206744	2	0	2	£676.88
2235206744	PCB J744 (BL2)	2900	35206744	2	0	2	£338.45
0035206745	PCB J745	2900	35206745	3	2	1	£360.00
2235206745	PCB J745 (BL2)	2900	35206745	3	2	1	£360.00
0035206746	PCB J746	2900	35206746	1	0	1	£120.00
2235206746	PCB J746 (BL2)	2900	35206746	1	0	1	£120.00
0035206747	PCB J747	2900	35206747	2	0	2	£480.00
2235206747	PCB J747 (BL2)	2900	35206747	2	0	2	£480.00
0035206748	PCB J748	2900	35206748	4	2	4	£120.00
2235206748	PCB J748 (BL2)	2900	35206748	4	2	4	£120.00
0035206749	PCB J749	2900	35206749	2	1	1	£240.00
2235206749	PCB J749 (BL2)	2900	35206749	2	1	1	£240.00
0035206750	PCB J750	2900	35206750	10	8	2	£1,200.00
2235206750	PCB J750 (BL2)	2900	35206750	10	8	2	£556.80
0035206751	PCB J751	2900	35206751	4	4	0	£480.00
2235206751	PCB J751 (BL2)	2900	35206751	4	4	0	£480.00
0035206752	PCB J752	2900	35206752	5	0	5	£600.00
2235206752	PCB J752 (BL2)	2900	35206752	5	0	5	£600.00
0035206753	PCB J753	2900	35206753	2	0	2	£240.00
2235206753	PCB J753 (BL2)	2900	35206753	2	0	2	£240.00
0035206754	PCB J754	2900	35206754	5	1	4	£3,060.00
2235206754	PCB J754 (BL2)	2900	35206754	5	1	4	£1,920.00
0035206755	PCB J755	2900	35206755	16	4	12	£720.00
2235206755	PCB J755 (BL2)	2900	35206755	16	4	12	£720.00
0035206756	PCB J756	2900	35206756	6	2	4	£974.40
2235206756	PCB J756 (BL2)	2900	35206756	6	2	4	£974.40
0035206757	PCB J757	2900	35206757	7	3	4	£840.00
2235206757	PCB J757 (BL2)	2900	35206757	7	3	4	£840.00
0035206758	PCB J758	2900	35206758	7	3	4	£840.00
2235206758	PCB J758 (BL2)	2900	35206758	7	3	4	£840.00
0035206759	PCB J759	2900	35206759	5	3	2	£600.00
2235206759	PCB J759 (BL2)	2900	35206759	5	3	2	£600.00
0035206760	PCB J760	2900	35206760	2	1	1	£240.00
2235206760	PCB J760 (BL2)	2900	35206760	2	1	1	£240.00
0035206761	PCB J761	2900	35206761	1	0	1	£120.00
2235206761	PCB J761 (BL2)	2900	35206761	1	0	1	£120.00
0035206762	PCB J762	2900	35206762	10	6	2	£1,392.00
2235206762	PCB J762 (BL2)	2900	35206762	10	6	2	£1,392.00
0035206763	PCB J763	2900	35206763	7	4	3	£840.00
2235206763	PCB J763 (BL2)	2900	35206763	7	4	3	£840.00
0035206764	PCB J764	2900	35206764	7	4	3	£840.00
2235206764	PCB J764 (BL2)	2900	35206764	7	4	3	£840.00
0035206765	PCB J765	2900	35206765	10	7	3	£1,200.00
2235206765	PCB J765 (BL2)	2900	35206765	10	7	3	£1,200.00
0035206766	PCB J766	2900	35206766	7	4	3	£840.00
2235206766	PCB J766 (BL2)	2900	35206766	7	4	3	£840.00
0035206767	PCB J767	2900	35206767	10	7	3	£1,200.00
2235206767	PCB J767 (BL2)	2900	35206767	10	7	3	£1,200.00
0035206768	PCB J768	2900	35206768	4	1	4	£480.00
2235206768	PCB J768 (BL2)	2900	35206768	4	1	4	£480.00
0035206769	PCB J769	2900	35206769	7	4	3	£840.00
2235206769	PCB J769 (BL2)	2900	35206769	7	4	3	£840.00
0035206770	PCB J770	2900	35206770	10	7	3	£1,200.00
2235206770	PCB J770 (BL2)	2900	35206770	10	7	3	£1,200.00
0035206771	PCB J771	2900	35206771	4	1	4	£480.00
2235206771	PCB J771 (BL2)	2900	35206771	4	1	4	£480.00
0035206772	PCB J772	2900	35206772	16	4	12	£720.00
2235206772	PCB J772 (BL2)	2900	35206772	16	4	12	£720.00
0035206773	PCB J773	2900	35206773	6	2	4	£974.40
2235206773	PCB J773 (BL2)	2900	35206773	6	2	4	£974.40
0035206774	PCB J774	2900	35206774	7	3	4	£840.00
2235206774	PCB J774 (BL2)	2900	35206774	7	3	4	£840.00
0035206775	PCB J775	2900	35206775	7	3	4	£840.00
2235206775	PCB J775 (BL2)	2900	35206775	7	3	4	£840.00
0035206776	PCB J776	2900	35206776	5	3	2	£600.00
2235206776	PCB J776 (BL2)	2900	35206776	5	3	2	£600.00
0035206777	PCB J777	2900	35206777	2	1	1	£240.00
2235206777	PCB J777 (BL2)	2900	35206777	2	1	1	£240.00
0035206778	PCB J778	2900	35206778	1	0	1	£120.00
2235206778	PCB J778 (BL2)	2900	35206778	1	0	1	£120.00
0035206779	PCB J779	2900	35206779	10	6	2	£1,392.00
2235206779	PCB J779 (BL2)	2900	35206779	10	6	2	£1,392.00
0035206780	PCB J780	2900	35206780	7	4	3	£840.00
2235206780	PCB J780 (BL2)	2900	35206780	7	4	3	£840.00
0035206781	PCB J781	2900	35206781	10	7	3	£1,200.00
2235206781	PCB J781 (BL2)	2900	35206781	10	7	3	£1,200.00
0035206782	PCB J782	2900	35206782	7	4	3	£840.00
2235206782	PCB J782 (BL2)	2900	35206782	7	4	3	£840.00
0035206783	PCB J783	2900	35206783	10	7	3	£1,200.00
2235206783	PCB J783 (BL2)	2900	35206783	10	7	3	£1,200.00
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0035206912	PCB J912	2800	35206912	3	1	2	£360.00
0007732132	PCB JLFX	FDS 640	54303308	39	20	19	£11,979.63
0007719141	PCB JLRV DATA LATCH	EDS 80 FIR	7719141	1	0	1	£154.43
0007732798	PCB JYV	FDS 640	75848909	45	21	24	£10,881.45
7980895451	PCB K/BRD DISPLAY DRIVER	DATA CHECK	9808954-51	23	1	22	£645.84
7980921100	PCB K/BRD LOGIC MT2001	DATA CHECK	9809211-00	6	2	4	£1,060.32
0088808137	PCB K137	D3 MOD K1	88808137	5	5	0	£155.90
0088808147	PCB K147	DRS 20 M30	88808147	84	23	61	£28,036.68
0088808153	PCB K153 RS232 I/F	D3P MOD SM	88808153	37	15	22	£8,195.50
0088808166	PCB K166 1MB STORE	D3P STOREX	88808166	28	8	20	£6,496.00
0086021365	PCB K174 ASSY	D3V PV2	86021365	28	28	0	£4,345.60
0086013043	PCB K174 ASSY	D3V MOD303	86013043	208	14	194	£31,799.04
0088808229	PCB K229 DC/DC	DRS 300	88808229	52	13	39	£5,938.40
0088808230	PCB K230 SCSI I/F	D3P MOD SM	88808230	53	27	26	£5,717.64
0088808251	PCB K251 VIDEO I/F	DEFC	88808251	1	1	0	£214.23
0088808256	PCB K256 SCAN POWER	DEFC	88808256	30	9	21	£2,498.70
0088808258	PCB K258	DEFC	88808258	17	6	11	£3,783.35
0088808264	PCB K264 VB COUPLER	D3P MODSM5	88808264	20	11	9	£6,565.60
0088808268	PCB K268 COMMS I/F	D3P MOD SM	88808268	4	3	1	£936.24
0088808279	PCB K279	D3P MOD A	88808279	149	17	132	£13,557.51
0086015319	PCB K287 LOGIC	D2V MOD 30	86015319	36	36	0	£5,400.00
0088808299	PCB K289	D3D MOD D	88808299	71	17	54	£4,864.21
0088808300	PCB K300 2MB STORE	D3P STOREX	88808300	6	3	3	£2,366.40
0088808302	PCB K302 1MB STORE	D3S STOREX	88808302	38	14	24	£8,907.20
0088808308	PCB K308 INCL K347	DEFC	88808308	5	4	1	£1,739.75
0088808311	PCB K311 GA2	D3P DMOD A	88808311	3	3	0	£193.38
0088808312	PCB K312	2800 PERI	88808312	2	0	2	£92.70
0088808318	PCB K318-REMOTE PRINTER I/F	DEFC	88808318	2	2	0	£834.06
0088808331	PCB K331 OSLAN I/F	D3P MOD SM	88808331	59	0	59	£8,772.12
0088808332	PCB K332 PSU	DEFC	88808332	6	1	5	£2,090.10
0088808350	PCB K350	D3P MOD A	88808350	210	28	182	£70,784.70
0088808351	PCB K351	D3F MOS F1	88808351	5	4	1	£627.15
0088808401	PCB K401 8MB STORE	D3S STOREY	88808401	53	10	43	£6,559.81
0088808403	PCB K403 4MB STORE	D3S STOREX	88808403	132	0	132	£37,820.64
0088808416	PCB K416	D3P MOD A4	88808416	1	1	0	£19.06
0088808417	PCB K417 SCAN BOARD	DEFC	88808417	30	22	8	£2,791.20
0088808425	PCB K425	D3D MOD D9	88808425	52	7	45	£4,125.88
0088808431	PCB K431 2MB STORE	D3P STOREX	88808431	207	0	207	£55,947.96
0088808438	PCB K438	D3 MOD K3	88808438	5	5	0	£152.40
0088808458	PCB K458 SCSI I/F	D3P MODSM2	88808458	10	6	4	£936.20
0088808460	PCB K460 SCAN/POWER	D2P MOD310	88808460	362	0	362	£27,584.40
0088808509	PCB K509	DEFC	88808509	29	17	12	£15,746.42
0088808526	PCB K526	DRS 300	88808526	4	4	0	£16.24
0088808610	PCB K610	DEFC 15/I/F	88808610	3	0	3	£1,392.00
0088808630	PCB K630	DEFC 15/I/F	88808630	3	3	0	£400.20
0088808636	PCB K636	D30P SCAFS	88808636	3	3	0	£1,740.00
0088808658	PCB K658 DSCAFS	DRS 6000	88808658	15	3	12	£7,974.30
0088808662	PCB K662	DRS 6000	88808662	1	0	1	£52.26
0088808676	PCB K676 X21 COMMS	D6L3 X21	88808676	2	1	1	£632.78
0088808689	PCB K689 SCAFS MK2	D6L4-7 SCA	88808689	2	2	0	£1,049.42
0088808712	PCB K712	D6L3 30MHZ	88808712	1	1	0	£67.30
0088808714	PCB K714	D6L3 PERC	88808714	14	13	1	£687.82
0088808718	PCB K718	D6L3 PERC	88808718	6	0	6	£1,470.54
0088808752	PCB K752 SCSI DIFF TO S/E CONVERTOR	D6L3 HA	88808752	2	0	2	£317.88
0007946514	PCB KB-ADAPTER MSR S41	50814/211	ROA1196508	4	0	4	£96.60
0007766326	PCB KEYBOARD LOGIC	9520/50	020133	5	5	0	£320.55
0007712569	PCB KFPV	EDS 200	7712569	4	2	2	£481.60
0007733325	PCB KLGX	FDS 640	54303710	60	27	33	£21,575.40
0007734143	PCB KSGV	EDS 80 FIR	7719143	67	0	67	£29,680.33

0007739631	PCB KYUV	FDS 640	75847311	16	20	£8,437.68
0007766766	PCB LAN ETHERNET COMBO WITH LM RPL	9530	PNO10052	2	0	£125.28
0007740850	PCB LEDVEXTENDER	FDS 2500	B96L-0780-0001A	1	1	£982.52
0007961098	PCB LEPV-10 E21	50814/095	71504426	10	2	£3,765.20
0007962278	PCB LEPV-82A INCL	50814/095	7962278	8	1	£400.00
0007763111	PCB LINE PROTECTION BARRIER	FDC	495-172	1	0	£44.08
0007729467	PCB LK8X ANALOG SERVO	FDS 160	7729467	2	2	£411.94
0007728995	PCB LKHV LOC A2805	EDS 80 FIR	7728995	5	2	£767.10
0007730858	PCB LKTX	FDS 840	7730858	7	0	£2,194.15
0007948105	PCB LOGIC (LMF)	50814/264	SMA008	107	21	£8,439.09
7022001000	PCB LOGIC APIV	DATAHECKE	049-022001-000	1	1	£91.14
0086018976	PCB LOGIC I/F ASSY INCL K239	D20VM8BLON	86018976	78	75	£18,578.82
7980214351	PCB LOGIC IOHCC (12 1 1)	DATAHECKE	9802143-51	7	5	£858.90
7980206951	PCB LOGIC LSI	DATAHECKE	9802069-51	21	8	£4,570.44
7980895652	PCB LOGIC MT2001	DATAHECKE	7980895652	176	174	£39,367.68
7021016500	PCB LOGIC SABR FOR 10776001	DATAHECKE	003-021016-500	33	20	£3,713.16
0007961536	PCB M 1363 PB E17	50814/240	6190181210	24	0	£8,614.32
0007961535	PCB M 1451 P E21	50814/240	6190181169	4	1	£626.24
0007928995	PCB M1397P	50814/240		820	0	£5,887.80
0007751745	PCB MAIN	FDC	7751745	1	1	£556.80
0007763261	PCB MAIN 80286 WITH 2MB MEMORY	9520/200	WD286-FSM-F001	9	1	£13,621.05
0007727243	PCB MAIN FOR 9606	FDC	7727243	3	1	£835.20
0007751058	PCB MAIN INCLUDING DISPLAY	FDC	7751058	1	1	£580.00
7014538043	PCB MAIN LOGIC IE167C	DATAHECKE	7014538043	107	91	£15,695.83
0007727051	PCB MAIN MK 2	FDC	7727051	33	14	£9,775.92
0007739082	PCB MAIN WITH FIRMWARE 960701	FDC	7739082	10	8	£4,176.00
0007944732	PCB MASTER (B3450)	50814/058	KDY198-1550/01	4	4	£425.28
0007769304	PCB MAU-LAG GDC	B&Q	GDC044A001001	5	5	£0.05
4902441203	PCB MAXI I/F	D20VM110VD	4902441203	15	13	£1,312.35
4902441202	PCB MAXI I/F	DRS RETAIL	4902441202	21	6	£1,774.08
4902441201	PCB MAXI I/F MODEL 10	DRS RETAIL	4902441201	71	23	£4,847.88
4902018201	PCB MAXI INT	DRS 20	4902018201	98	15	£7,420.56
4902030102	PCB MAXI PSU 200W	DRS 20 M30	005-8020301-02	16	5	£3,158.72
4902030103	PCB MAXI PSU 300W	DRS 20 M30	4902030103	250	241	£84,810.00
4902049402	PCB MBS AND PROCESSOR	DRS 20	4902049402	4	0	£587.64
4902049401	PCB MBS PROCESSOR	DRS 20	4902049401	1	1	£134.04
4902449501	PCB MDIOC 64K N/F	D20FTERMPR	005-8024495-01	5	5	£1,106.05
7018883000	PCB MDL IE-202 I/F	DATAHECKE	002-018883-000	3	1	£135.33
0007940549	PCB MEM EXP 2MB, 215/216/328	50814/098	250-0311-10	61	2	£15,597.09
0007730648	PCB MEMORY	D88P CONT	7730648	23	7	£5,598.20
0007733192	PCB MEMORY (256K)	D88F CWPEN	V300-040-051	28	16	£6,837.60
7980845253	PCB MEMORY 1 MB FAST LOGIC	DATAHECKE	9808452-53	15	9	£348.00
7008956002	PCB MEMORY 16K RAM CMOS	DATAHECKE	003-008956-002	22	21	£1,079.76
0007751373	PCB MEMORY 2MB	D40F STORE	070AAA3202	1	1	£985.94
7010107006	PCB MEMORY 48K EDAC	DATAHECKE	003-010107-006	1	0	£72.48
7014503000	PCB MEMORY 512K	DATAHECKE	040-014503-000	21	2	£4,890.69
4901181333	PCB MEMORY 8K	1500	4901181333	1	1	£79.84
7008065005	PCB MEMORY CCD 16K DYN MEM 4K	DATAHECKE	003-008065-005	101	58	£8,101.41
7015541005	PCB MEMORY EXPANSION 384KB CMOS	DATAHECKE	003-015541-005	43	15	£73,035.93
0080060585	PCB MEMORY I/F	D50P MOD32	140-01393-00006	14	7	£25,315.08
0080061739	PCB MEZZANINE	DIMP PROC	XIM-FC	1	1	£138.88
0007961013	PCB MIA	50814/014	15123250-00	5	0	£377.95
0007961017	PCB MIA 4544 E18	50814/014	15135300-00	10	5	£2,067.80
0007759766	PCB MICROPROCESSOR AP10S	D60 UPS	72875042	15	15	£11,588.70
0007719153	PCB MLVV ACCESS 1	EDS 80	54277713	27	17	£3,425.49
4902540801	PCB MOD 120/125 I/F	D20P MOD12	4902540801	38	24	£5,361.04
0007765064	PCB MOTHER	ANNEX 3	AX3-SPR-MLB-160	15	4	£12,475.80
0007765075	PCB MOTHER	ANNEX XL	AXM-SPR-MLB-160	8	0	£4,064.64
0007730645	PCB MOTHERBOARD	D88P CONT	7730645	37	15	£3,884.26

PCB

0007734979	PCB MOTHERBOARD	D8BP CONT	7734979	38	15	23	£17,232.62
008800796	PCB MOTHERBOARD	DRS 20	88800796	5	0	5	£207.70
0007765631	PCB MOTHERBOARD WD286 FOR DEMO M/C	ATM	7765631	3	3	0	£2,291.73
7010781012	PCB MOTOR ASSY	DATA CHECK	7010781012	1	0	1	£9.36
0007926147	PCB MP2 PROCESSOR	50814073	470-000111-300	4	0	4	£9,101.56
0080060579	PCB MPCC CONTROLLER	D50P OSCAR	140-01429-00008	15	13	2	£28,723.65
0007761885	PCB MSR CONTROLLER	9520/200	N86B-4653-P202	3	0	3	£247.68
7010673000	PCB MSR I/F	DATA CHECK	003-010673-000	36	21	15	£835.20
0007961042	PCB MUX	50814075	7961042	4	0	4	£1,385.64
7015273000	PCB MXV 11	DATA CHECK	7015273000	37	19	18	£23,857.23
0007719492	PCB NEEDLE DRIVER	7500	7719492	1	0	1	£212.16
0007719143	PCB NLOV	EDS 80	54275715	31	15	16	£4,037.13
0007723259	PCB NLRV	EDS 80	54276115	23	13	10	£3,841.92
0007940182	PCB NVGA2-BOARD, 1 MB	50814268	AC40162.3	2	0	2	£271.48
0007719155	PCB NZJN READ AMP	EDS 80	75061715	64	9	55	£20,837.12
0007759772	PCB O/P TX TERMINALS	D60 UPS	76115002	56	52	4	£10,167.36
0765530500	PCB ORDV RECEIVER	2903-4 190	765530500	1	0	1	£40.12
0765530561	PCB ORE TERMINATOR	2903-4 190	765530561	1	0	1	£40.00
4901338946	PCB OSC & DATA DECK 54	1500	91821701	2	0	2	£616.52
4901274374	PCB OUTPUT + MEM LOAD	1500	59744900	3	1	2	£613.59
0084809011	PCB P001	7500	84809011	11	11	0	£1,852.84
0084773211	PCB P003 VERSION 3	7500	84773211	8	5	3	£1,442.56
0084811211	PCB P004	2900 O STA	84811211	44	6	38	£28,193.00
0084880811	PCB P010	7500	84880811	2	0	2	£80.48
0085022411	PCB P016	7500	85022411	6	4	2	£375.84
0085037015	PCB P021	2900	85037015	10	4	6	£1,833.00
0085903511	PCB P025 V3	7500	85903511	7	4	3	£1,669.08
0085223511	PCB P030	7500	85223511	5	3	2	£975.90
0085911811	PCB P031	7500	85911811	14	8	6	£3,475.22
0088803311	PCB P033	7500	88803311	4	4	0	£500.80
0088800037	PCB P037	2900	88800037	9	6	3	£1,080.00
0088800038	PCB P038	2900	88800038	12	6	6	£2,650.80
0088800039	PCB P039	2900	88800039	2	0	2	£240.00
0088800044	PCB P044 CONTROL	2903-4	88800044	16	12	4	£1,333.92
0088800085	PCB P085	7500	88800085	5	5	0	£1,317.35
0088800088	PCB P088	7500	88800088	8	3	5	£2,209.12
0088800089	PCB P089	7500	88800089	15	5	10	£3,134.10
0088800095	PCB P095 MK1	7500	88800095	1	0	1	£177.06
0085187911	PCB P202	7500	85187911	5	2	3	£1,008.80
0085187913	PCB P202 VER 2	7500	85187913	82	8	74	£16,204.02
008820511	PCB P205	2900	8820511	10	5	5	£4,278.90
008822011	PCB P220	2900	8822011	10	6	4	£1,200.00
0085199711	PCB P222	7500	85199711	1	0	1	£42.50
008823811	PCB P238	2900	8823811	8	0	8	£3,628.40
008823911	PCB P239	2900	8823911	9	4	5	£1,080.00
008824111	PCB P241	2900	8824111	7	4	3	£840.00
008824211	PCB P242	2900	8824211	18	13	5	£7,244.46
008824311	PCB P243	2900	8824311	13	4	9	£1,560.00
008824411	PCB P244	2900	8824411	9	7	2	£1,080.00
008824511	PCB P245	2900	8824511	10	6	4	£1,200.00
008824611	PCB P246	2900	8824611	15	10	5	£1,800.00
008824711	PCB P247	2900	8824711	7	5	2	£840.00
008825311	PCB P253	2900	8825311	34	14	20	£15,232.00
008825511	PCB P255	2900	8825511	1	0	1	£94.48
008825711	PCB P257	2900	8825711	19	13	6	£7,831.99
008826511	PCB P265	2900	8826511	3	1	2	£1,514.28
008826611	PCB P266	2900	8826611	11	0	11	£3,102.22
008827011	PCB P270	2900	8827011	10	3	7	£1,392.00
008827111	PCB P271	2900	8827111	5	2	3	£600.00

0088827211	PCB P272	EDS 60	88827211	4	4	0	£2,175.04
0088827311	PCB P273	2900	88827311	12	7	5	£1,440.00
0088800280	PCB P280 MACRO MK2	2900		1	1	0	£120.00
0088828911	PCB P289	2900	88828911	1	1	0	£120.00
0088800308	PCB P308	2900	88800308	6	4	2	£1,720.38
0088800324	PCB P324 IBM COUPLER	2903 - 4	88800324	26	10	16	£16,230.50
0088800346	PCB P346	2900	88800346	10	5	5	£1,200.00
0088800354	PCB P354	2900	88800354	19	9	10	£7,619.00
0088800373	PCB P373	2900	88800373	13	3	10	£4,233.58
0088800456	PCB P456	2900	88800456	27	11	16	£9,543.96
0088803507	PCB P507 MK2 MACRO	2900	88803507	13	9	4	£1,560.00
0088803510	PCB P510	2900	88803510	7	4	3	£840.00
0088803511	PCB P511	2900	88803511	8	3	5	£3,161.82
0088803512	PCB P512	2900	88803512	14	9	5	£1,680.00
0088803513	PCB P513	2900	88803513	11	4	7	£1,320.00
0088803514	PCB P514	2900	88803514	9	2	7	£876.96
0088803515	PCB P515	2900	88803515	7	2	5	£840.00
0088803517	PCB P517	2900	88803517	4	1	3	£480.00
0088803518	PCB P518	2900	88803518	7	4	3	£840.00
0088803520	PCB P520	2900	88803520	7	1	6	£940.00
0088803522	PCB P522	2900	88803522	4	1	3	£480.00
0088803523	PCB P523	2900	88803523	10	3	7	£1,392.00
0088803534	PCB P534 MK2A	2900	88803534	3	0	3	£360.00
0088803535	PCB P535 MK2A	2900	88803535	4	1	3	£480.00
0088803536	PCB P536 MK2	2900	88803536	11	5	6	£1,320.00
0088803537	PCB P537 MK2A	2900	88803537	5	2	3	£600.00
0088803548	PCB P548	2900		21	21	0	£2,520.00
0088803553	PCB P553	2900 CAFS	88803553	28	0	28	£8,341.48
0088803555	PCB P555 IN Z00463 ONLY PCB P552 IN Z00475	2900 CAFS	88803555	4	0	4	£1,654.80
0088803557	PCB P557	2900 CAFS	88803557	1	0	1	£120.00
0088803559	PCB P559	2900	88803559	1	0	1	£120.00
0088803561	PCB P561	2900	88803561	4	1	3	£480.00
0088803562	PCB P562	2900	88803562	3	0	3	£360.00
0088803563	PCB P563	2900	88803563	1	0	1	£120.00
0088803659	PCB P659	2900	88803659	8	6	2	£992.96
0088803661	PCB P661	2900	88803661	5	2	3	£1,608.05
0085551713	PCB P903	2900	85551713	1	0	1	£87.54
0088890611	PCB P906	7500	88890611	2	1	1	£295.00
0007961668	PCB PAC LOGIC BOARD E17	50814/052	ROA1195287	15	15	0	£3,545.40
0007726400	PCB PC360	FLEXI DISC	7766900	27	2	25	£4,594.05
0007948863	PCB PER UNIT MULTIPL LINE	50814/096	7948863	65	44	21	£24,776.05
0007769637	PCB PERIPHERAL CONTROL FLM70CA	ATMLANDMAR	CA20205-B30X	4	4	0	£600.00
0007961009	PCB PHA E40	50814/013	15110390-40	16	12	4	£1,874.24
0007765040	PCB POWER	D60 UPS EN	05137444-4	16	8	8	£9,812.00
0007755916	PCB POWER AMP	EA2	B17B-0530-0010AU	5	4	1	£4,336.55
0007707423	PCB POWER AMP	EDS 100	75184800	6	4	2	£3,870.72
7004128112	PCB POWER BOARD 3002	DATAHECKE	7004128112	3	3	0	£69.60
7004947001	PCB POWER BOARD SVENSKA	DATAHECKE	7004947001	29	22	7	£938.15
0007757437	PCB POWER CONTROL	D50P EXPBO	140-10046-00000	15	10	5	£7,895.55
0007751169	PCB POWER CONTROL	D50P MOD32	145-01455-00000	2	2	0	£375.94
7007172003	PCB POWER CONTROL(STD)	DATAHECKE	7007172003	163	38	125	£17,734.40
7014538045	PCB POWER FOR 2100 (NO SCANNER CONNECTION)	DATAHECKE	049-014538-045	54	0	54	£1,499.58
0007756494	PCB POWER SUPPLY	D3M MTU	X116034	18	18	0	£1,373.40
4902487802	PCB POWER SUPPLY LVL1/128	D20P M128S	4902487802	29	3	26	£5,427.06
4902537801	PCB POWER SUPPLY MOD 120/125	D20F MOD12	4902537801	7	1	6	£1,113.07
7000000047	PCB POWER UN-MODIFIED (SVENSKA)	DATAHECKE	7000000047	7	5	2	£350.00
7018975000	PCB POWER4 FOR 2170/2200(WITH SCANNER CONNECT)	DATAHECKE	002-018975-000	78	73	5	£1,770.60
0007756680	PCB PR-CONT	9518/200	D168-9624-0432	7	1	6	£1,073.52
0007961021	PCB PRC MRX E18	50814/015	15143050-00	27	26	1	£4,982.58

0007763743	PCB PRC02A	ATM 7000	CA20144-892X	2	0	2	0	2	£721.28
7020714000	PCB PRE-AMP	DATAHECKE	003-020714-000	2	0	2	0	2	£303.52
7980201151	PCB PRINTER CONTROLLER	DATAHECKE	9802011-51	43	2	41	2	41	£2,368.87
7018832000	PCB PRINTER I/F	DATAHECKE	003-018832-000	11	6	5	6	5	£178.75
0007761882	PCB PRINTER PP39AB 9520/200	9520/200	D15B-9679-0931	12	11	12	11	11	£2,600.40
0007961015	PCB PRM 3 (ERICSSON VERS) E18	50814/015	15127690-60	30	10	30	10	20	£3,639.00
0007961000	PCB PROCESSOR	50814/074	002-000654-003	14	11	14	11	3	£11,036.48
0007961002	PCB PROCESSOR	50814/074	002-000713-003	4	1	4	1	3	£4,866.16
7009089001	PCB PROCESSOR	DATAHECKE	7009089001	2	0	2	0	2	£22.80
7008153001	PCB PROCESSOR	DATAHECKE	003-008153-001	2	2	2	0	0	£100.14
0007739065	PCB PROCESSOR	FDC	490-325	1	1	1	1	0	£185.62
7010997000	PCB PROCESSOR 1 IRC (NO ROMS)	DATAHECKE	003-010997-000	5	4	5	4	1	£161.70
7009090012	PCB PROCESSOR 1 IRC SDC-C	DATAHECKE	003-009090-012	25	13	25	13	12	£1,592.50
7003907007	PCB PROCESSOR 325 1/2P	DATAHECKE	7003907007	7	6	7	6	1	£731.43
7018904002	PCB PROCESSOR 32K FOR 2170 NO EPROMS	DATAHECKE	003-018904-002	16	0	16	0	16	£3,150.88
7018904000	PCB PROCESSOR 32K FOR 2200 NO EPROMS	DATAHECKE	003-018904-000	12	0	12	0	12	£1,419.96
7007977009	PCB PROCESSOR 400 SERIES	DATAHECKE	003-007977-009	2	2	2	2	0	£153.12
7011472001	PCB PROCESSOR 6514 1/2P	DATAHECKE	7011472001	8	8	8	8	0	£529.60
7009369004	PCB PROCESSOR BOARD M160	DATAHECKE	7009369004	2	2	2	2	0	£101.64
7014285007	PCB PROCESSOR IE184B	DATAHECKE	049-014285-007	1	1	1	1	0	£50.86
0088808567	PCB PROCESSOR K567	D3P MOD A5	88808567	12	0	12	0	12	£9,668.88
0088808709	PCB PROCESSOR K709 36MHZ VIKING	D6L3.36MHZ	88808709	6	0	6	0	6	£6,450.42
7000000085	PCB PROCESSOR MICRO	DATAHECKE	7000000085	4	1	4	1	3	£3,421.40
0007862416	PCB PROCESSOR NDP-10A	50814/259	AA362522	1	0	1	0	1	£69.06
0007728960	PCB PROCESSOR NO 2	DRS 20 M30	728960	14	5	14	5	9	£11,839.24
7007737001	PCB PROCESSOR REMOTE 1/2P	DATAHECKE	003-007737-001	5	4	5	4	1	£260.65
0007739945	PCB PROCESSOR STAGE 4 POS	8505	5AAPEE1450CA	56	0	56	0	56	£14,146.16
7000000048	PCB PROCESSOR VER 219 1/2P DISPLAY	DATAHECKE	7000000048	2	1	2	1	1	£118.84
7000000050	PCB PROCESSOR VER 219 NON 1/2P DISPLAY	DATAHECKE	7000000050	4	2	4	2	2	£391.76
7000000049	PCB PROCESSOR VER 220 NON 1/2P DISPLAY	DATAHECKE	7000000049	5	3	5	3	2	£489.70
7000000051	PCB PROCESSOR VER 221 NON 1/2P DISPLAY	DATAHECKE	7000000051	17	8	17	8	9	£1,664.98
7980910451	PCB PS DISPLAY ALPHA 3 10W	DATAHECKE	7980910451	11	0	11	0	11	£255.20
0007948147	PCB PSU	50814/076	SMM028	62	45	62	45	17	£1,530.16
0007948146	PCB PSU	50814/264	SMM014	21	19	21	19	2	£1,012.41
0007719495	PCB PSU	7500	7719495	3	2	3	2	1	£3,518.73
4902091501	PCB PSU	D20P M25CO	005-90209155-01	25	8	25	8	17	£3,636.00
4902032901	PCB PSU	D20VM110VD	4902032901	70	16	70	16	54	£10,860.50
7980227450	PCB PSU	DATAHECKE	9802274-50	2	0	2	0	2	£51.38
4902030101	PCB PSU	DRS 20	4902030101	6	0	6	0	6	£817.26
0007723768	PCB PSU	FDC	480 017 02	3	3	3	3	0	£400.89
7015019000	PCB PSU 5V	DATAHECKE	003-015019-000	26	21	26	21	5	£1,286.74
7980934451	PCB PSU FLOPPY DISK	DATAHECKE	9809344-51	4	4	4	4	0	£82.80
4902589401	PCB PSU FOR MOD 128	D20P M128S	4902589401	2	0	2	0	2	£704.36
0088800797	PCB PSU G797	DRS 20 M30	88800797	43	6	43	6	37	£17,742.68
0088808516	PCB PSU K516	D3P MOD A5	88808516	26	4	26	4	22	£4,035.46
7980984251	PCB PSU MF PRINTER	DATAHECKE	9809842-51	35	14	35	14	21	£1,537.90
4902560001	PCB PSU MOD 110 RFI	D20VM110VD	677359	1	1	1	1	0	£222.48
7980969951	PCB PSU OWM - LSI	DATAHECKE	9809699-51	19	9	19	9	10	£871.91
7980835200	PCB PSU POSITKR	DATAHECKE	7980835200	2	1	2	1	1	£67.24
0007961018	PCB PSU PRM-5	50814/015	15136860-00	21	14	21	14	7	£2,140.74
7980941751	PCB PTR CONTRL ALPHA 3	DATAHECKE	9809417-51	8	1	8	1	7	£603.76
7009709001	PCB PTR OPTION BD M500	DATAHECKE	003-009709-001	1	0	1	0	1	£48.38
0007961449	PCB PUM-A E17	50814/044	ROF1976255/1	24	7	24	7	17	£2,453.04
0080060587	PCB PWR CONTROL	D50P OSCAR	80060587	12	2	12	2	10	£4,333.80
7011553003	PCB PWR V2 50HZ WESTREX /SVENSKA WITH BATTERY	DATAHECKE	7011553003	63	31	63	31	32	£2,592.45
7011553008	PCB PWR V3 50HZ DC WESTREX ONLY NO BATTERY	DATAHECKE	003-011553-008	5	5	5	5	0	£208.05
0007731927	PCB QK8X	FDS 160	76971915	49	10	49	10	39	£13,191.78
7018630000	PCB QRCB IPC 1 CHANNEL	DATAHECKE	003-018630-000	13	9	13	9	4	£1,701.18
7018629000	PCB QRCB IRC 2 CHANNEL	DATAHECKE	003-018629-000	33	28	33	28	5	£5,185.29

7010781028	PCB R DECT	DATA CHECK	7010781028	1	0	1	£5 56
0007755704	PCB RAW DIGITAL	D50F MTU	90-09060-011A	5	0	5	£5,365 00
0007755712	PCB READ PREAMP	D50F MTU	90-06923-001	2	0	2	£352 64
4900547083	PCB READ RECOVERY	1500	101381-01	1	0	1	£696 62
0007719514	PCB READ WRITE	1500	7719514	3	0	3	£1,570 29
7000311004	PCB READER (9301)	DATA CHECKE	700-000311-004	10	1	9	£4,178 40
7000000002	PCB READER I/F (INTERMEC)	DATA CHECKE	7000000002	12	12	0	£1,332 96
7009900001	PCB REAR DISPLAY I/F	DATA CHECKE	003-009900-001	45	20	25	£5,130 00
7009681001	PCB REAR DISPLAY INTEGRATED	DATA CHECKE	003-009681-001	465	153	312	£37,758 00
7010704001	PCB REGULATOR/CHARGER	DATA CHECKE	003-010704-001	12	8	4	£603 48
0007764388	PCB RELAY I/F	D60 UPS	76236002	5	0	5	£710 95
0080061133	PCB REPEATER SET INCLUDES 88825131 & 88825133	D60P PROC	80061133	29	12	17	£46,446 11
0088825133	PCB REPEATER VME BUS (HOST) B133 DRS6000	DRS 6000	88825133	3	0	3	£6,264 00
4901997901	PCB REPLACED BY 4901997902	D20P MOD50	4901997901	2	1	1	£325 28
0007735860	PCB RFOAU	EAGLE	C16B-5501-0310/U	97	0	97	£62,014 04
0007732037	PCB RNON	FDS 160	54085714	24	23	1	£4,533 84
0007751183	PCB RS232	D50F ASYNC	145-01315-00001	6	6	0	£5,128 28
0080061966	PCB RS232 I/F REI LN98FA	9520/200	D06B-3330-0202	2	1	1	£162 36
0007731915	PCB RS232 I/O I/F	FDC	7731915	11	2	9	£1,020 80
7014538028	PCB RS232 IE-179A 2109	DATA CHECKE	049-014538-028	28	12	16	£724 36
0080061967	PCB RS232 X.2 I/F LN98DB	9520/200	D16B-9674-0101	1	0	1	£126 40
4902050901	PCB S10 CONTROL	D20V M10VD	4902050901	7	0	7	£1,242 43
0007733185	PCB S10L	D89P 8801S	V300-038-050	23	13	10	£2,134 40
0005311537	PCB S943 "UNOBTAINABLE" QMFF SFCP/X25	2900 X25	5311537	3	1	2	£1,115 37
7015484000	PCB SABR SCANNER I/F	DATA CHECKE	003-015484-000	57	15	42	£6,331 56
0007946485	PCB SAD MC 8859 E21	50814096	7946485	12	8	4	£1,626 98
7004345001	PCB SCALE I/F W/O DTS	DATA CHECK	7004345001	3	1	2	£60 96
7980236651	PCB SCAN FOR 10776001	DATA CHECKE	9802366-51	66	35	31	£23,323 08
0086018468	PCB SCAN INCL TRANSFORMER & YOKE	D20P MOD15	86018468	16	15	1	£1,205 12
7010329001	PCB SCANNER	DATA CHECKE	7010329001	38	17	21	£7,574 16
7009807002	PCB SCANNER I/F 2 IRC + PARALLEL & SERIAL PORT	DATA CHECKE	003-009807-002	65	28	37	£10,713 30
7009807004	PCB SCANNER I/F 2 IRC + PARALLEL PORT	DATA CHECKE	003-009807-004	3	3	0	£83 46
7009807003	PCB SCANNER I/F 2 IRC + SERIAL PORT	DATA CHECKE	003-009807-003	37	2	35	£720 02
4902514901	PCB SCB 11 N/F	D20P M20DS	4902514901	16	7	9	£4,051 84
4901998502	PCB SCB II	DRS 20	4901998502	10	9	1	£2,049 20
4901998503	PCB SCB II (N/F)	D20P M20DS	4901998503	117	33	84	£23,945 22
0007730649	PCB SCREEN/DISC(NEXOS & 8801 M/CS)	D89P CONT	7730649	68	24	44	£12,857 44
0007756493	PCB SCSI ADAPTOR	D3M MTU	120875	1	1	0	£863 36
0007755481	PCB SCSI CONTROLLER	D50P OSCAR	099-10011-00000	20	8	12	£42,109 60
0007755482	PCB SCSI CONTROLLER ADAPTOR	D50P OSCAR	099-10013-00000	15	9	6	£5,781 45
4901523947	PCB SECTOR COUNTER	1500	4901523947	1	0	1	£112 38
4901523940	PCB SENSOR	1500	11411-03	1	0	1	£215 18
0007722476	PCB SERIAL I/F VER 2	7500	7722476	8	0	8	£4,862 40
0007714797	PCB SERIAL INTERFACE	7500	7714797	5	3	2	£1,093 70
0007766323	PCB SERIAL PRINTER I/F	9520/50	010074	8	8	0	£450 64
0007724427	PCB SERVO SPO 6888	1500	7724427	1	0	1	£223 13
0007755709	PCB SERVO PREAMP	D50F MTU	90-07147-004	8	0	8	£1,057 92
4900547693	PCB SERVO PSU	1500	4900547693	16	3	13	£10,208 00
4902050902	PCB SIO CONTROL	DRS 20	676029	62	13	49	£15,639 50
0007730382	PCB SKFV	EDS 80 FIR	7730382	3	0	3	£444 81
7004610001	PCB SLIP PRINTER I/F	DATA CHECKE	003-004610-001	9	3	6	£450 00
0042001470	PCB SM6 VIDEO	D2P MOD310	42001470	17	6	11	£3,771 11
0080043796	PCB SNA COMMS BAT5 VSN 3 FUNC MDL 30	D20FCOMMPR	80043796	7	3	4	£1,831 69
0007764389	PCB SNUBBER	D60 UPS	76235002	24	23	1	£508 56
0007759767	PCB SNUBBER APT130	D60 UPS	72899022	42	28	14	£11,788 14
0007753242	PCB STAND-OFF FOR 007101/01	DRS 8801	7753242	46	46	0	£5 52
0007758289	PCB STORE 8MB	D40P STORE	070AAA9902	7	1	6	£18,838 40
0007734969	PCB STREAM TAPE CONTRL	D40P MOD25	2CAAA07601	34	12	22	£14,050 50
7980859250	PCB SUPERVISORY C1700	DATA CHECK	9802267-50	10	2	8	£470 00

0007735861	PCB SVLAU REVH	EAGLE	C16B-5501-0330/U	101	27	74	£15,469.16
0007961671	PCB SYSTEM UNIT MASTER E17	50814037	7920278	33	31	2	£14,182.74
0007961672	PCB SYSTEM UNIT MASTER BOARD E17	50814037	ROA1195601R6A	36	35	1	£15,472.08
0007755035	PCB SYUMU	EA3	B16B-9100-0010AU	1	0	1	£176.29
0007735868	PCB SYUMU	FDS 2500	B16B-9100-0010AU	9	1	8	£1,128.42
0035200033	PCB T033	2900	35200033	4	3	1	£918.52
0035200109	PCB T109 MACRO	2900	35200109	1	0	1	£120.00
0035200110	PCB T110 MACRO	2900	35200110	8	5	3	£960.00
0035200113	PCB T113	2900	35200113	2	0	2	£240.00
0035200114	PCB T114	2900	35200114	4	1	3	£480.00
0035200115	PCB T115	2900	35200115	2	0	2	£240.00
0035200128	PCB T128	2900	35200128	2	0	2	£240.00
0035200129	PCB T129	2900	35200129	1	0	1	£42.02
0035200130	PCB T130	2900	35200130	2	0	2	£84.04
0035200131	PCB T131	2900	35200131	2	0	2	£240.00
0035200134	PCB T134	2900	35200134	2	0	2	£484.30
0035200136	PCB T136	2900	35200136	2	0	2	£480.00
0035200141	PCB T141	2900	35200141	4	0	4	£480.00
0035200142	PCB T142	2900	35200142	3	2	1	£360.00
0035200143	PCB T143	2900	35200143	3	2	1	£417.60
0035200144	PCB T144	2900	35200144	1	0	1	£120.00
0035200150	PCB T150	2900	35200150	4	2	2	£480.00
0035200152	PCB T152	2900	35200152	1	0	1	£120.00
0035200154	PCB T154	2900	35200154	1	0	1	£120.00
0035200155	PCB T155	2900	35200155	3	1	2	£360.00
0035200158	PCB T158	2900	35200158	2	0	2	£240.00
0035200166	PCB T166	2900	35200166	3	1	2	£417.60
0035200170	PCB T170	2900	35200170	2	0	2	£240.00
0035200172	PCB T172	2900	35200172	1	0	1	£120.00
0035200174	PCB T174	2900	35200174	3	1	2	£360.00
0035200175	PCB T175	2900	35200175	2	0	2	£278.40
0035200176	PCB T176	2900	35200176	2	0	2	£240.00
0035200176	PCB T176	DATA CHECK	7980202250	4	4	0	£86.92
7980202250	PCB T2 CONNECTOR MODULE	2900	35200228	1	0	1	£139.20
0035200228	PCB T228	2900	35200230	1	0	1	£120.00
0035200230	PCB T230	2900	35200231	1	0	1	£120.00
0035200231	PCB T231	2900	35200232	1	0	1	£120.00
0035200232	PCB T232	2900	35200235	2	0	2	£240.00
0035200235	PCB T235	2900	35200239	1	0	1	£120.00
0035200239	PCB T239	2900	35200240	1	0	1	£120.00
0035200240	PCB T240	2900	35200245	1	0	1	£139.20
0035200245	PCB T245	2900	35200246	2	0	2	£240.00
0035200246	PCB T246	2900	35200247	1	0	1	£120.00
0035200247	PCB T247	2900	35200247	1	0	1	£120.00
2235200248	PCB T248 (BL2)	2900	2235200248	1	0	1	£120.00
0035200251	PCB T251	2900	35200251	1	0	1	£360.00
0035200254	PCB T254	2900	35200254	3	1	2	£240.00
0035200256	PCB T256	2900	35200256	2	0	2	£120.00
0035200264	PCB T264	2900	35200264	1	0	1	£120.00
0035200265	PCB T265	2900	35200265	1	0	1	£120.00
0035200268	PCB T268	2900	35200268	1	0	1	£120.00
0035200274	PCB T274	2900	35200274	1	0	1	£120.00
0035200331	PCB T331	2900	35200331	2	1	1	£240.00
0035200332	PCB T332	2900	35200332	3	1	2	£360.00
0035200376	PCB T376 MACRO	2900	35200376	2	1	1	£240.00
0035200377	PCB T377 MACRO	2900	35200378	4	2	2	£480.00
0035200378	PCB T378 MACRO	2900	35200379	2	0	2	£240.00
0035200379	PCB T379 MACRO	2900	35200380	1	0	1	£120.00
0035200380	PCB T380	2900	35200381	1	0	1	£120.00
0035200381	PCB T381	2900	35200381	1	0	1	£120.00

0035200390	PCB T390	2900	35200390	1	1	0	£120.00
0035200400	PCB T400	2900	35200400	2	0	2	£240.00
0035200401	PCB T401	2900	35200401	4	1	3	£556.80
0035200402	PCB T402	2900	35200402	6	4	2	£720.00
0035200403	PCB T403	2900	35200403	2	0	2	£906.08
0035200404	PCB T404	2900	35200404	4	3	1	£480.00
0035200438	PCB T438	2900	35200438	17	10	7	£2,040.00
0035200439	PCB T439	2900	35200439	3	1	2	£360.00
0035200440	PCB T440	2900	35200440	7	6	1	£840.00
0035200441	PCB T441	2900	35200441	1	0	1	£120.00
0035200442	PCB T442	2900	35200442	1	0	1	£120.00
0035200443	PCB T443	2900	35200443	1	0	1	£120.00
0035200444	PCB T444	2900	35200444	1	0	1	£120.00
0035200445	PCB T445	2900	35200445	2	1	1	£240.00
0035200446	PCB T446	2900	35200446	1	0	1	£120.00
0035200447	PCB T447	2900	35200447	1	0	1	£120.00
0035200450	PCB T450	2900	35200450	1	1	0	£120.00
0035200451	PCB T451	2900	35200451	5	4	1	£600.00
0035200483	PCB T483	2900	35200483	4	4	0	£648.00
0035200488	PCB T488	2900	35200488	1	0	1	£120.00
0035200489	PCB T489	2900	35200489	1	0	1	£120.00
0035200490	PCB T490	2900	35200490	1	0	1	£120.00
0035200491	PCB T491	2900	35200491	1	0	1	£120.00
0035200496	PCB T496 DC CONTROL	2900		1	0	1	£120.00
0035200521	PCB T521	2900	35200521	14	5	9	£1,680.00
0035200522	PCB T522	2900	35200522	6	2	4	£720.00
0035200523	PCB T523	2900	35200523	5	2	3	£600.00
0035200524	PCB T524	2900	35200524	6	2	4	£720.00
0035200545	PCB T545	2900	35200545	9	3	6	£1,080.00
0035200546	PCB T546	2900	35200546	11	9	2	£1,320.00
0035200609	PCB T609	2900	35200609	3	1	2	£360.00
4900929520	PCB TAPE AMP	1500	4900929520	1	1	0	£43.50
4900547688	PCB TAPE CONTROL C1	1500	101241-11	11	2	9	£1,731.51
4901425832	PCB TAPE CRT 10	1500	4901425832	4	0	4	£1,079.20
4901260670	PCB TAPE TRANSPORT	1500	4901260670	1	0		£189.22
0007948083	PCB TAR-A	50814/044	ROF1976258/1	31	18	13	£3,137.51
7015168000	PCB TCB WITH IRC	DATAHECKE	003-015168-000	15	4	11	£1,560.15
0007943133	PCB TCC-XC	50814/044	7943133	1	0	1	£209.88
7014538016	PCB TDL I/F IE-182A 2106	DATAHECKE	049-014538-016	20	0	20	£939.60
7020672501	PCB TERMINAL CONTROLLER FOR 18777/001	DATAHECKE	003-020672-501	87	3	84	£16,694.43
0007961638	PCB TIA B	50814/095	7961638	7	6	1	£158.62
0007755034	PCB TIQMU	EAS	B16B-8860-0010AVU	5	4	1	£945.95
0035200151	PCB TIS1	2900	35200151	1	0	1	£120.00
0007734528	PCB TKTX	FDS 640	76978318	56	15	41	£40,832.40
0080062549	PCB TOKEN RING K675	D60P TOKEN	80062549	2	0	2	£3,121.68
0007754889	PCB TRM FL92BA	ATM	CA20050-B02X	6	6	0	£546.90
0007949039	PCB TUA-E	50814/095	E341800010	8	6	2	£144.88
0007961448	PCB TUM-A	50814/044	7961448	2	1	1	£235.20
0007765069	PCB TWISTED PAIR	ANNEX 3	AX3-SPR-TP-160	8	7	1	£556.80
4902421805	PCB U018 BUS CNTRL/FORMATTER FUNC	D20P M128S	4902421805	6	2	4	£2,206.74
0007735884	PCB UNIT DRV SEQ	FDS 2500	B14L-5105-E018A	8	5	3	£6,143.76
0007961640	PCB UPB	50814/095	7961640	22	21	1	£1,638.34
7022495000	PCB US VPN 401769Y MSP	DATAHECKE	049-022495-000	11	10	1	£343.75
0080060586	PCB VERSABUS I/F	D50P MOD32	140-10018-00000	16	10	6	£25,764.32
4902007402	PCB VID TERM ADAPT	DRS RETAIL	676734	33	19	14	£1,764.18
4902007401	PCB VIDEO ADAPTOR	DRS 20	4902007401	15	5	10	£438.75
7980239351	PCB VIDEO BDI	DATAHECKE	9802393-51	24	12	12	£3,481.92
0080061336	PCB VIDEO DISPLAY ADAPTOR	DIMP DRIVE	80061336	2	0	2	£1,322.40
4902007403	PCB VIDEO TERM ADAPTER	D20P MOD15	677959	2	0	2	£68.14

0007948120	PCB VIDEO/POWER	50814/062	SMA087	13	13	0	£626.73
0007751182	PCB VIOC	D50F CONTR	7751182	5	2	3	£5,126.45
0007751166	PCB VIOC CONNECTOR MOTHER BOARD	D50F PANEL	145-01317-00000	5	3	2	£2,090.10
0007765296	PCB VMCR	D60T EXABY	7765296	4	2	2	£4,805.52
0007755951	PCB VME BUS ADAPTOR	D40PETHCON	7755951	1	0	1	£458.22
0007751172	PCB VMTC	D50P MOD32	089-10003-00000	7	1	6	£21,828.80
0007707441	PCB VOLTAGE REGULATOR+5V	EDS 100	75179802	3	3	0	£417.12
0007719895	PCB VOLTAGE REGULATOR-5V	EDS 100	75184101	6	4	2	£831.24
0007730643	PCB VTSKME DISPLAY	DRS 8801	7730643	153	25	128	£62,118.00
0036907672	PCB W300 ASSY	ESS	36907672	1	1	0	£747.60
0036907439	PCB W320 MOTHERBOARD	FD2	36907439	4	4	0	£1,539.28
4802544701	PCB WORK STN PROC 2 UK W/O BEZEL FUNC	D20P MOD15	4802544701	95	23	72	£31,530.50
4900547082	PCB WRITE CONTROL	1500	PEC10138601	2	0	2	£717.44
0007730368	PCB X COMP ASSY	FDS 640	34907264	2	1	1	£685.40
0034907264	PCB X052 FUNC ASSY	D20V ROMPK	80091165	6	0	6	£780.00
0080091165	PCB X077	DEFC	80091526	4	4	0	£108.72
0080091526	PCB X079	D40F XSPOP	070AAA1602	2	2	0	£209.00
0007751351	PCB XSP	2900	33416123	69	21	48	£65,598.30
0033416123	PCB Y123	2900	33416375	1	0	1	£94.47
0033416375	PCB Y375	2900	33416543	1	0	1	£94.47
0033416543	PCB Y543	2900	33416645	1	0	1	£94.47
0033416645	PCB Y645	2900	33411458	1	0	1	£94.47
0033411458	PCB Z458	2900	6180181211	30	29	1	£7,533.60
0007929126	PCB, M1377P	50814/240		34	34	0	£6,244.78
0007961537	PCB, M 1364 P E17	50814/240		1	1	0	£256.82
0007961538	PCB, M 1376 P E17	50814/240		24	24	0	£6,394.56
0007961539	PCB, M 1378 P E17	50814/240		1	1	0	£316.74
0007929130	PCB, M 1448 P E17	50814/240	7829130	1	1	0	

Disp2

0007765658	PCB	KX-P4451	PJWP6P4451M	14	14	0	£249.48
0007765657	PCB	KX-P4451	PJWP5P4451M	21	20	1	£326.13
0007765655	PCB	KX-P4451	PJWP3P4451M	13	13	0	£225.94
0007765678	PCB	KX-P4451	PJWP2P4451M	15	15	0	£229.20
0007763587	PCB	LPS PP250	B17B-0140-0820AU	3	3	0	£1,622.07
0007763586	PCB	LPS PP250	B17B-0140-0810AU	3	3	0	£924.72
0007764113	PCB	LPS PP250	B17B-0140-0980AU	1	0	1	£565.95
0007764112	PCB	LPS PP250	B17B-0140-0970AU	1	0	1	£611.78
0007764110	PCB	LPS PP250	B17B-0140-0930AU	2	2	0	£1,374.44
0007820204	PCB	NORTEL	257265-001	3	3	0	£907.23
0007820750	PCB - MPU *A*	NORTEL	NT170555-1	1	0	1	£78.89
0007822125	PCB 800BPI M T FML 3	NORTEL	NT81001240	1	0	1	£44.45
0007752448	PCB +48V UNIT REV5	LPTR	N100863A	3	2	1	£3,214.08
0007732937	PCB +5V REGULATOR	MTU MTS61M	108705	11	8	3	£1,854.27
0007752449	PCB +5V UNIT	LPTR	N100864A	2	2	0	£1,102.46
0007820359	PCB 0 25IN TAPE CONTROLLER	NORTEL	180785-1	1	1	0	£87.36
0007724537	PCB 0002 CARD	OFFPTR QUM	7724537	1	0	1	£479.45
0007754429	PCB 006220/02 TERMINATOR/EXTENDER S26311D378X	LPS ND3	1067125	4	3	1	£219.68
0005142829	PCB 0091	LPTR	5142829	1	1	0	£25.50
0007820123	PCB 1024K MEMORY NO 1	NORTEL	06920009	2	1	1	£3,796.42
0005311373	PCB 1062 QMEDIA	NETWK NETS	5311373	2	0	2	£2,738.26
0007734180	PCB 12V PSU	LPTR LW40	44692084	13	0	13	£1,159.60
0005085885	PCB 1435 VOLTAGE REGULATOR	LPTR	5085885	1	0	1	£37.18
0005132704	PCB 1441	LPTR	5132704	1	0	1	£46.08
0005133224	PCB 1459	LPTR	5133224	1	0	1	£13.18
0007719346	PCB 1539 1CC	MARS DEFAU	7719346	1	0	1	£100.78
0007822134	PCB 1600BPI M T FML 1	NORTEL	NT81001820	1	0	1	£38.37
0007820010	PCB 186 PROCESSOR SBC	NORTEL	ILC 9850-2	6	6	0	£4,586.64
0005305141	PCB 1909	NETWK CREA	5305141	2	0	2	£240.00

0007820124	PCB 2048K MEMORY NO 1	NORTEL	NT10810011	2	0	2	£6,232.32
0007820306	PCB 205294A1 ANALOG SUB-ASSY	NORTEL	NT210142-1	2	1	2	£3,344.06
0007726341	PCB 214	OFFPTR	7726341	6	0	6	£1,746.96
0007726342	PCB 216	OFFPTR	210-21-611	2	1	1	£916.82
0007726343	PCB 217	OFFPTR	7726343	1	0	1	£406.50
0082768411	PCB 2428 (RECLAIM ONLY)	MAG TAPE 1	82768411	1	0	1	£41.46
0082769411	PCB 2430	MAG TAPE 1	82769411	2	0	2	£78.24
0082769711	PCB 2431	MTU	82769711	2	2	0	£51.52
0082770711	PCB 2432	MAG TAPE 1	82770711	3	1	2	£124.38
0082771011	PCB 2433 +30V REG	MAG TAPE 1	82771011	1	0	1	£65.05
0082771311	PCB 2434 50V REG	MAG TAPE 1	82771311	2	0	2	£59.28
0082772311	PCB 2435 SEQUENCE CONTROL	MAG TAPE 1	82772311	1	0	1	£44.17
0082840011	PCB 2442 VOLTAGE SENSING	MAG TAPE 1	82840011	1	0	1	£65.05
0082841011	PCB 2443	MAG TAPE 1	82841011	1	0	1	£41.46
0082842611	PCB 2444 CONTROL	MAG TAPE 1	82842611	1	0	1	£41.46
0007820012	PCB 256K MEMORY EXPANSION	NORTEL	ILM 9860	1	0	1	£226.01
0082986111	PCB 2586	MEDIA	82986111	1	0	1	£40.12
0084866011	PCB 2609	MTU	84666011	1	1	0	£34.86
0083060617	PCB 2610	MTU MT12	83060617	1	0	1	£29.47
0083061411	PCB 2612 ADDRESS	MAG TAPE	83061411	3	2	1	£107.94
0083061815	PCB 2613 SEQUENCE	MTU MT12	83061815	1	0	1	£30.48
0083062216	PCB 2614	MEDIA	83062216	1	0	1	£30.35
0083062616	PCB 2615	MAG TAPE	83062616	1	0	1	£30.35
0083128811	PCB 2618	MAG TAPE 1	83128811	1	0	1	£29.47
0083057811	PCB 2621	MAG TAPE	83057811	2	2	0	£83.20
0083059013	PCB 2624	MTU	83059013	2	1	1	£38.66
0083059413	PCB 2625	MTU	83059413	1	0	1	£30.35
0083060213	PCB 2627	MTU	83060213	1	0	1	£41.76
0083052611	PCB 2628	MAG TAPE 1	83052611	1	0	1	£29.47
0083054221	PCB 2632	MEDIA	83054221	1	1	0	£102.54
0083055420	PCB 2635	MEDIA	83055420	1	0	1	£29.46
0083604416	PCB 2843	MTU MT12	83604416	1	0	1	£27.06
0083630711	PCB 2853	MTU	83630711	1	0	1	£29.64
0084421613	PCB 2855 V2	MTU	84421613	1	0	1	£30.35
0084127216	PCB 2965	MARS DEFAU	84127216	1	0	1	£36.04
0084212718	PCB 2967	MTU MT12	84212718	1	0	1	£38.16
0084212211	PCB 2968	MT60	84212211	13	2	11	£668.33
0084186511	PCB 2974	MARS DEFAU	84186511	2	0	2	£58.92
0084286715	PCB 2994	MTU MT12	84286715	1	0	1	£30.35
0084286711	PCB 2994	MTU MT12	84286711	3	2	1	£140.25
4900890785	PCB 2AYN WRITE ERASE	MARS DEFAU	4900890785	4	2	2	£160.48
0007820126	PCB 2MB MEMORY EXPANSION	NORTEL	7820126	5	2	3	£7,324.40
0007715399	PCB 2PC2	LPTR PBS36	7715399	95	16	79	£57,757.15
0007756915	PCB 2XX COMMS SYSTEM F-0071-0	NITWKOSPAC	F-0071-0	1	0	1	£5,406.87
0007757977	PCB 35CP095	NIP PP240	N204156A	2	2	0	£1,678.20
0007757975	PCB 35DV061	NIP PP240	N201890A	3	2	1	£1,211.04
0007750213	PCB 35IF421 I/F	LPTR LP200	N100389A	11	5	6	£7,685.81
0007757976	PCB 35IF551	NIP PP240	N203709A	4	3	1	£1,806.00
0007750212	PCB 35MC131 MECH CTRL	LPTR LP200	N201262A	7	5	2	£5,721.80
0007757974	PCB 35MC162	NIP PP240	N204491A	2	1	1	£931.96
0007750142	PCB 35PD071 PAPER FEED DRIVER	LPTR LP200	N201264A	6	5	1	£7,359.72
0007750214	PCB 35SC015 STACKER CTRL	LPTR LP200	PCB 35SC015	4	1	3	£2,800.12
0007750211	PCB 37CP037 CPU	LPTR LP200	N200701A	16	6	10	£37,023.20
0007750138	PCB 37PC011 PRINT CONTROL	LPTR LP200	220918A	6	4	2	£6,134.46
0007750143	PCB 37PC061 PRT CTRL	LPTR LP200	N201411A	9	2	7	£9,201.69
0007750138	PCB 37PF021 PAPER FEED	LPTR LP200	N201260A	17	6	11	£17,380.97
0007752763	PCB 4 SYNCHRONOUS CHANNEL V35	NITWKOSPAC	F-0052-0	1	1	0	£1,509.42
0005083656	PCB 4005	LPTR LP150	5083656	1	0	1	£46.80
0005083657	PCB 4006	LPTR LP150	5083657	2	0	2	£83.50

0007820094	PCB 40MB DISC CONTROLLER FOR SRC	NORTEL	NT10580001	10	7	3	£5,905.10
0005082667	PCB 4271	LPTR LP150	5082667	2	2	0	£81.10
0005082652	PCB 4274	LPTR LP150	5082652	1	0	1	£60.18
0005071238	PCB 4280 I/F TRANSMITTER	LPTR LP150	5071238	7	0	7	£437.57
0005071240	PCB 4281 RECEIVER	LPTR LP150	5071240	3	1	2	£196.80
0005082677	PCB 4298	LPTR LP150	5082677	2	1	1	£90.78
0005084345	PCB 4299	LPTR LP150	5084345	1	0	1	£39.16
0007820367	PCB 4515 ANALOGUE	NORTEL	NTA0294801	1	0	1	£46.67
0005133077	PCB 4749	LPTR	5133077	1	0	1	£25.48
0005076658	PCB 4829	LPTR LP150	5076658	2	1	1	£60.52
0005078177	PCB 4923	LPTR	5078177	1	0	1	£18.62
0005081652	PCB 4924	LPTR	5081652	3	1	2	£177.18
0005082135	PCB 4927	LPTR	5082135	1	0	1	£39.86
0005082152	PCB 4928	LPTR LP150	5082152	4	3	1	£104.32
0005088007	PCB 4941	LPTR	5088007	1	0	1	£15.15
0005088009	PCB 4944	LPTR	5088009	1	0	1	£48.34
000PY00008	PCB 4MB DUAL PROC UNIT (150Mhz DPU)	MARS_DEFAU	6000-0273-008	1	0	1	£44,606.70
0007820128	PCB 4MB MEMORY ADDITIONAL	NORTEL	18807002	1	1	0	£2,785.69
0084211013	PCB 5118	MT60	84211013	11	7	4	£1,512.39
0007737586	PCB 5121890U NRZI CONTROL FMT	MTU MTS780	C16B-5121-0890/U	8	3	5	£3,671.52
0084220111	PCB 5122	MTU	84220111	6	4	2	£1,275.60
0007737563	PCB 5127924U FMT CONTROL I/F	MTU MTS780	C16B-5127-0920/U	8	7	1	£3,880.64
0007820248	PCB 512K	NORTEL	7820248	1	0	1	£418.70
0007731586	PCB 512KB MAIN STORE	NTWKKNPS	23768	8	1	7	£13,994.24
0084574012	PCB 5149	MTU	84574012	1	0	1	£5.90
0084686319	PCB 5159	MTU	84686319	5	4	1	£378.90
0085085912	PCB 5193	MT60	85085912	7	2	5	£313.67
0085086014	PCB 5194	MTU MTS310	85086104	15	3	12	£903.45
0005311608	PCB 5215-05 DSD CONFIGURED	NETWK NETS	5311608	5	2	3	£8,301.85
0007820039	PCB 640348-2	NORTEL	027668	8	5	3	£5,791.20
0084530711	PCB 6A027	MTU	84530711	1	0	1	£40.43
0084530812	PCB 6A028	MTU	84530812	1	0	1	£37.90
0084530914	PCB 6A029	MTU	84530914	1	0	1	£40.00
0084531111	PCB 6A031	MARS_DEFAU	84531111	1	0	1	£28.46
0084531211	PCB 6A032	MTU	84531211	1	0	1	£51.34
0085442012	PCB 6A087	MARS_DEFAU	85442012	1	0	1	£60.42
0085034111	PCB 6A089	MARS_DEFAU	85034111	1	0	1	£35.24
0085182616	PCB 6A099	MAG TAPE	85182616	1	1	0	£54.89
0085427211	PCB 6A119	LPTR	85427211	1	1	0	£39.16
0085428211	PCB 6A120	LPTR	85428211	17	8	9	£1,248.65
0085860011	PCB 6A164	LPTR	85860011	2	1	1	£95.04
0088616511	PCB 6A165	LPTR	88616511	1	0	1	£65.09
0088860185	PCB 6A185	MTU	88860185	3	2	1	£152.22
0086000194	PCB 6A186	MTU	86000194	2	1	1	£63.78
0088860194	PCB 6A194	MTU	88860194	1	1	0	£24.06
0007752761	PCB 8 ASYNCHRONOUS CHANNEL RS232	NTWKOSFAC	F-0010-0	1	0	1	£838.07
0007752762	PCB 8 SYNCHRONOUS CHANNEL RS232	NTWKOSFAC	F-0011-0	4	4	0	£6,271.96
0005312607	PCB 8630 CONF BD PLUS ADD STORE	NETWK PERI	5312607	12	2	10	£11,763.12
0005314217	PCB 8630 CONFIGURED	NTWKOSLAN	5314217	5	0	5	£8,634.80
0005311550	PCB 8630 CONFIGURED BOARD	NETWK PILA	5311550	14	2	12	£13,723.64
0005312608	PCB 8630 LESS PROMS	NTWKOSLAN	5312608	8	0	8	£9,236.40
0005314202	PCB 8630 PLUS G947 ASSY	NTWKOSLAN	5314202	11	11	0	£1,705.22
0005314402	PCB 8630 QMFH-B LESS PROMS	NTWKOSLAN	5314402	3	0	3	£4,017.36
0005314431	PCB 8630 QMGT LESS PROMS	NTWKOSLAN	5314431	7	0	7	£6,876.80
0005134631	PCB 9485	LPTR	5134631	2	2	0	£63.58
0005137374	PCB 9542	LPTR LP150	5137374	1	0	1	£108.20
0005137375	PCB 9543	LPTR LP150	5137375	7	3	4	£800.94
0005137376	PCB 9544	LPTR LP150	5137376	1	0	1	£52.14
0005137377	PCB 9545	LPTR LP150	5137377	3	2	1	£242.28

0005137378	PCB 9546	LPTR LP150	5137378	6	2	4	£297 90
0007732027	PCB A PREAMP R/W HEAD	MTU GTS	402527201	7	6	1	£3,491 74
0007821610	PCB A MAP SYSTEMS SUPPORT	NORTEL	7821610	1	0	1	£78 21
0007725521	PCB AADA	LPS	380016	2	2	0	£236 10
0007725473	PCB ABLB	LPS	401463	18	18	0	£3,268 26
0007725542	PCB ABSH	LPS	581216	5	5	0	£501 85
0007725557	PCB ABSJ	LPS	995789	2	2	0	£325 22
0007713746	PCB AC POWER CONTROL	LPTR	7713746	1	0	1	£34 88
0007766212	PCB ACP10 PERSONALITY MODULE	NETWK ACP	1033-000	3	3	0	£270 36
0007725591	PCB ADAB	LPS	380504	1	1	0	£153 65
0007725526	PCB ADAN	LPS	526495	2	2	0	£292 62
0007725623	PCB ADAP	LPS	521329	1	1	0	£142 92
0007727088	PCB ADAPTOR C/MODE	MTU 60KB	76245	20	9	11	£2,434 40
0007725624	PCB ADAS	LPS	528579	2	2	0	£255 46
0007725625	PCB ADAT	LPS	528587	2	2	0	£671 20
0005311422	PCB ADD STORE FOR PCB 86/30	NETWK PERI	5311422	1	0	1	£479 68
0007725511	PCB AFAB	LPS	521302	2	2	0	£210 76
0007725558	PCB AFAG	LPS	534617	2	2	0	£19 76
0007820268	PCB ALPINE I/O	NORTEL	NT180915-1	1	0	1	£48 00
0007732175	PCB ANALOG	OFFPTR QUM	91174-04	3	1	2	£1,271 34
0007820231	PCB ANALOG DTP 297/44	NORTEL	110345-1	1	0	1	£928 39
0007820232	PCB ANALOG DTP 4515/5	NORTEL	110415-1	22	6	16	£14,953 62
0007820307	PCB ANALOG WAS 2011798	NORTEL	NT840002-2	2	0	2	£1,327 80
0007820173	PCB AOC BASE	NORTEL	7820173	2	2	0	£1,160 20
0007820172	PCB AOC CAD1 BASE	NORTEL	NT30650001	23	8	15	£13,342 07
0007820186	PCB AOC COMMS (DOS) USA	NORTEL	159720/19	1	0	1	£95 12
0007820386	PCB AOC MOTHER	NORTEL	NT30340001	5	5	0	£241 05
0007820152	PCB AOCII BASE BOARD	NORTEL	NT30440002	7	5	2	£662 76
0007732635	PCB ASF160/560 8048	OFFPTR R16	350-107-503	25	14	11	£3,587 25
0007820348	PCB ASSEMBLY CONTROL	NORTEL	NT10310001	9	8	1	£722 25
0007732898	PCB ASSY FRONT PANEL	OFFPTR R13	7732898	11	9	2	£1,251 47
0007739562	PCB ASSY FRONT PANEL RP1600	OFFPTR R16	7739562	7	6	1	£435 47
0088804420	PCB ASSY G420	MCUX	88804420	18	7	11	£7,591 32
0088804423	PCB ASSY G423	MCUX	88804423	7	7	0	£1,670 90
0007715493	PCB ASSY INPUT PRINT D-P	LPTR PBS 7	44674835	35	15	20	£4,019 40
0007715494	PCB ASSY QSC HDR & VERT	LPTR PBS 7	7715494	20	5	15	£1,649 00
0007752663	PCB ASSY SCAN 15 KHZ	NTWK NPS	28742	3	3	0	£957 00
0007725469	PCB AST	LPS	328278	2	2	0	£245 82
000771147	PCB AST ETHERNET MODULE	MARS DEFAU	202499-001	3	3	0	£609 00
0007725580	PCB ASTB	LPS	504432	2	2	0	£218 18
0007725581	PCB ASTC	LPS	380369	2	2	0	£647 06
0007725582	PCB ASTD	LPS	380377	1	1	0	£181 46
0007725583	PCB ASTE	LPS	380385	3	3	0	£707 79
0007725464	PCB ASY	LPS	494305	2	2	0	£181 96
0007756331	PCB AT131 MAIN	OFFPTR DY4	711166Y	32	15	17	£6,609 60
0007725481	PCB AUAD	LPS	923996	1	1	0	£204 51
0007766240	PCB BA199 MTR	OFFPTR	725017	4	4	0	£1,157 12
0007750216	PCB BACKPLANE	LPTR PB144	44687466	1	0	1	£164 00
0007733406	PCB BACKPLANE ASSY 360X	LPTR LW40	7733406	1	0	1	£243 54
0007725506	PCB BAGB	LPS	355747	6	6	0	£814 14
0007820236	PCB BAND GATE	NORTEL	274073-005	3	1	2	£1,154 16
0007729592	PCB BARRIER CARD	NTWK NPS	23389	8	1	7	£409 36
0007766229	PCB BASE ASSY P11, P21, P41 4683 IBM	IBM POS	IBM74F9886	11	3	8	£14,482 60
0005401335	PCB BC72 ROMCAPSULE INTERFILE	OPD WSTNUK	5401335	4	4	0	£24 92
0007758754	PCB BD DEVICE ADAPTOR MD	MT3	410448304	1	1	0	£511 28
0007738954	PCB BEDAA	LPS 10	1061550	8	6	2	£5,742 80
0007821805	PCB BFFX	NORTEL	7821805	1	0	1	£182 34
0007725472	PCB BFS1	LPS	496278	1	1	0	£127 32
0007766060	PCB BG LOGIC BOARD	MT3	404452506	2	2	0	£12,165 46

0007725462	PCB BGS	LPS	328189	3	3	0	£227.91
0007725513	PCB BINA	LPS	514143	2	2	0	£213.34
0007823473	PCB BISYNC-FML 7-11	NORTEL	7823473	1	0	1	£61.08
0007822272	PCB BISYNC FML 7-11	NORTEL	NT81004410	1	0	1	£248.73
0007822174	PCB BISYNC FML 7-11	NORTEL	NT81002323	2	0	2	£95.26
0007822171	PCB BISYNC FML 7-11	NORTEL	NT81002273	2	0	2	£144.56
0007822159	PCB BISYNC FML 7-8	NORTEL	NT81002231	2	0	2	£112.46
0007822160	PCB BISYNC FML 7-8	NORTEL	NT81002241	1	0	1	£81.37
0007822173	PCB BISYNC FML 7-8	NORTEL	NT81002281	1	0	1	£77.69
0007820260	PCB BISYNC DMA	NORTEL	NT81004472	1	1	0	£221.56
0007820258	PCB BISYNC I/O CONTROL	NORTEL	NT81004307	3	3	0	£780.05
0007820262	PCB BISYNC LOGIC	NORTEL	NT81004864	2	2	0	£503.92
0007820263	PCB BISYNC MEMORY CONTROL	NORTEL	NT81004951	2	0	2	£132.00
0007820257	PCB BISYNC MEMORY CONTROL	NORTEL	NT81004294	1	1	0	£337.10
0007820259	PCB BISYNC OPERATOR PANEL	NORTEL	NT81004430	2	2	0	£194.46
0007820251	PCB BISYNC PROCESSOR	NORTEL	NT81004283	6	2	4	£2,339.76
0007819018	PCB BLM BASIC LINE MODULE PROGRAM CODE 131	MODMIAL	1310/01	1	0	1	£377.00
0007774205	PCB BOARD DEFLECTION MAIN APPLE	MARS DEFAU	APP661-0881	1	0	1	£500.00
0007758753	PCB BR READ SEQUENCER MD	MT3	402863502	4	4	0	£7,074.88
0007725572	PCB BRCC	LPS	539732	8	8	0	£618.08
0007726654	PCB BRPA	LPS	401455	7	7	0	£354.55
4901154038	PCB BRUSH READER	LPTR	50644808	1	0	1	£94.45
0007758790	PCB BU MICROPROCESSOR MD	MT3	411014201	7	1	6	£4,421.76
0007758725	PCB BV SHARED MEMORY MD	MT3	402804608	3	0	3	£1,443.45
0007758788	PCB BW WRITE SEQUENCER MD	MT3	402811602	7	6	1	£4,458.93
0007725529	PCB BWAC	LPS	510820	2	2	0	£315.20
0007758724	PCB BY TEMP SENSOR	MT3	402884203	3	3	0	£206.76
0007725584	PCB BYAA	LPS	380393	3	3	0	£498.48
0007725585	PCB BYAB	LPS	380407	6	6	0	£665.28
0007725587	PCB BYAD	LPS	499161	1	1	0	£181.82
0007725589	PCB BYAE	LPS	380458	2	2	0	£236.10
0007758791	PCB BZ 10MS SCSI I/F	MT3	410486406	1	0	1	£824.08
0007811476	PCB CA-PX 30	MARS DEFAU	7811476	1	0	1	£48.00
0007759634	PCB CAM V24V11	NTWKOSPAC	3060-000	7	6	1	£1,324.68
0007754617	PCB CAMAF S26311D511V1-4	LPS ND3	1205013	8	1	8	£10,136.07
0007820235	PCB CARTRIDGE TAPE 2 ASSY-ALPINE	NORTEL	NT120700-1	2	2	0	£2,770.64
0007725508	PCB CBSE	LPS	355771	2	2	0	£232.06
0007725498	PCB CB5G	LPS	355623	3	3	0	£328.44
0007725515	PCB CB5H	LPS	517178	2	2	0	£215.94
0007725516	PCB CB5J	LPS	517186	2	2	0	£358.38
0007725528	PCB CB5N	LPS	510912	1	1	0	£116.04
0007814647	PCB CCA CARD ELS3	MARS DEFAU	7814647	1	0	1	£84.67
0007725534	PCB CCAB	LPS	380040	1	1	0	£123.75
0007725601	PCB CCAC	LPS	380660	3	3	0	£546.96
0007725609	PCB CCAE	LPS	491446	2	2	0	£666.60
0007756466	PCB CE505 CONSULE RH	LPTR	N101352A	5	0	5	£8,121.95
0007756693	PCB CE605 RH CONSULE	LPTR	N101422A	6	5	1	£15,189.12
0007759627	PCB CEM ASYNC 4XV24/RS422 SMARTNET 4000	NTWKOSPAC	4005-000	5	1	4	£2,297.90
0007759628	PCB CEM SYNC 2XV24/V35 SMARTNET 4000	NTWKOSPAC	4004-000	1	1	0	£540.69
0007759630	PCB CEM SYNC 2XV24/V11 SMARTNET 4000	NTWKOSPAC	4004-001	4	0	4	£2,595.32
0007752750	PCB CENTRAL PROCESSOR UNIT A	NTWK	F-0047-0	5	4	1	£47,310.15
0007751731	PCB CEPT FORMATTER	MARS DEFAU	MC264AA	1	0	1	£4,021.50
0007764855	PCB CFE CORE FUNCTION ENHANCED	MTU	B05L-1090-0176A	2	2	0	£4,569.26
0007757137	PCB CHARGE/DEV HV KX-P4450	OFFPTR P44	PJPM7Z	7	6	1	£153.30
0007759477	PCB CHARGE/DEV HV KX-P4450I	OFFPTR P44	PJPM11Z	2	1	1	£85.46
0007731575	PCB CLP HLINE REMOTE 64K	NTWK NPS	23552	22	0	22	£25,162.72
0007820394	PCB COLOUR ADAPTOR EUROPEAN	NORTEL	NT30670010	1	0	1	£80.03
0007754622	PCB COMAC S26311D407X -6	LPS ND3	7754622	1	0	1	£1,173.70
0007820098	PCB COMMS - BSC3780 NO 1	NORTEL	06920006	1	0	1	£710.08

0007820110	PCB COMMS ASYNC/SYNC	NORTEL	NT180650-1	2	2	0	£232 94
0007732547	PCB COMMS FOR F02370/12	MARS DEFAU	7732547	19	14	5	£1,897 72
0007824957	PCB COMMS X25 VIENNA SRC	NORTEL SRC	10819009	4	0	4	£5,479 84
0007756616	PCB COMMS/MODEM BREAKOUT	MODM	7756616	1	0	1	£312 16
0007762252	PCB CONAH(APA1-CONTROLLER LOCATION A722)	LPS 40 NDX	01144294	2	2	0	£452 52
0007733337	PCB CONT BD Q-3	OFFPTR R16	7733337	22	3	19	£3,432 00
0007754483	PCB CONTROL	OFFPTR 402	140K04860	7	2	5	£2,715 37
0007751413	PCB CONTROL	OFFPTRGP17	80667006	14	10	4	£7,674 66
0007738524	PCB CONTROL LOGIC	LPTR PB144	7738524	1	0	1	£223 52
0007756571	PCB CONTROL MODULE	NTWKOSPAC	7756571	1	0	1	£438 60
4901338943	PCB CONTROL PANEL	LPTR	91826100	2	2	0	£535 50
0007731142	PCB CONTROL PANEL	LPTR PB144	7731142	7	2	5	£2,390 22
0007758075	PCB CONTROL PANEL	NIP PP240	71110967-001	4	3	1	£1,730 20
0007757095	PCB CONTROL PANEL KX-P4450	OFFPTR P44	PJWP10P4450M	8	5	3	£169 84
0007759470	PCB CONTROL PANEL KX-P4450I	OFFPTR P44	PJWP10P4450IU	16	16	0	£343 36
0007750860	PCB CONTROL Q-SIF	OFFPTR 150	7750860	12	9	3	£5,592 72
0007728626	PCB CONTROLLER	MICROPOLIS	100295-51-8	8	0	8	£2,496 64
0007820301	PCB CONTROLLER	NORTEL	7820301	1	0	1	£56 40
0007751537	PCB CONTROLLER	OFFPRINTER	53535800	24	5	19	£33,051 60
0007755218	PCB CONTROLLER	OFFPRINTER	G0006905	63	0	63	£29,497 86
0007771557	PCB CONTROLLER AT/XT BUS	MARS DEFAU	7771557	3	3	0	£0 03
0007751730	PCB COV LINE	MARS DEFAU	MC323AD	5	0	5	£10,053 80
0007750152	PCB CP041 PANEL CONTROLLER	LPTR LP200	221445A	2	2	0	£753 04
0007750994	PCB CP01-CP	NTWKNSP	27363	5	2	3	£5,539 00
0007756407	PCB CPU + MEMORY	NTWKOSPAC	2027-000 + 2028-000	11	3	8	£16,355 79
0007814667	PCB CPU LOGIC	LPTR LW80	44693612S	2	1	1	£1,283 48
0007814565	PCB CPU LOGIC	MARS DEFAU	44693611	1	1	0	£612 49
0007738937	PCB CPUAC S26311D338V 3-8	LPS 10	1102958	2	0	2	£2,505 64
0007754624	PCB CPUAD S26311D358V2 -9	LPS ND3	1200917	9	0	9	£19,691 28
0007762249	PCB CPUAQ(APA1-CONTROLLER LOCATION AB/21)	LPS 40 NDX	01167839	1	1	0	£770 49
0007725488	PCB CPUD	LPS	523313	1	1	0	£194 56
0007764865	PCB CR CONTROL READ	MTU	B17B-1540-0110A	3	0	3	£4,759 62
4901916314	PCB CRT CNTR (SQ LED)	ME29	4901916314	8	6	2	£1,938 96
4901916301	PCB CRT CONTROLLER UK/NEED	ME29	4901916301	23	10	13	£4,135 17
0007759900	PCB CSC LESS MEMORY	NTWKOSPAC	F-0108-0	2	1	1	£7,569 62
0007754627	PCB CTBAB S26311D435X -11	LPS ND3	1135511	3	1	2	£6,408 00
0007732945	PCB CURRENT MODE I/F	MTU MTS61M	108703	17	7	10	£3,353 76
4900890723	PCB CWEV	MARS DEFAU	4900890723	2	0	2	£80 02
0007725465	PCB DAA	LPS	328227	3	3	0	£992 46
0007725512	PCB DACC	LPS	355879	3	3	0	£329 13
0007732439	PCB DACO	LPS 14/2	7732439	4	4	0	£904 24
0007758932	PCB DATA CONTROL	MTU MTS780	95123638/41	4	4	0	£2,178 16
0007732943	PCB DATA FORMATTER	MTU MTS61M	108701	25	12	13	£7,975 00
0007763130	PCB DAUGHTER BD 4 PORT SYNC CS434	NETWK SERV	MOD402	2	2	0	£492 74
0007763722	PCB DAUGHTER CS434 IBM	NTWKOSNETC	MOD406	9	6	3	£5,618 88
0007725461	PCB DAW	LPS	461970	1	1	0	£251 00
4950037301	PCB DBCB	LPTR	4950037301	12	4	8	£1,464 84
0007756467	PCB DC OUTPUT UNIT	LPTR	N101300A	6	0	6	£12,848 94
0007765991	PCB DC POWER DISTRIBUTION	LP600	0400008200	2	2	0	£193 60
0007754615	PCB DCOAC S26311D508X -6	LPS ND3	1189578	2	0	2	£1,704 06
0007758931	PCB DDP	MTU MTS780	95123620/13	4	4	0	£3,218 16
0007738933	PCB DEHAA	LPS 10	1173243	1	0	1	£707 39
0007754614	PCB DEHAC S26311D506V1 -4	LPS ND3	1169840	4	2	2	£2,829 52
0007737568	PCB DEHAU FMT VFO	MTU MTS780	C16B-5501-0570U	9	1	8	£8,565 66
0007734057	PCB DELAH S26311D46 -3	LPS 14/2	1130927	2	1	1	£511 30
0007737569	PCB DGAMU FMT DIST PCB	MTU MTS780	B16B-7390-0010AU	9	4	5	£8,358 39
0007754609	PCB DHPAB S26311D 510X -2	LPS ND3	1106627	1	0	1	£375 63
0007732174	PCB DIGITAL	OFFPTR QUM	84398 02	2	1	1	£181 12
0007722690	PCB DIND	LPS	727849	1	0	1	£760 55

0007725611	PCB DIPA	LPS	484725	3	3	0	£278.16
0007820174	PCB DISC FIFLOPPY CONTROLLER	NORTEL	NT30660010	12	8	4	£1,869.60
0007751728	PCB DISC INTERFACE	MARS DEFAU	MC20788	1	0	1	£1,237.14
0007824759	PCB DISP STN ANALOG	NORTEL	NT170525-1	8	5	3	£1,178.56
0007820015	PCB DISP CONT IDC 186	NORTEL	ILC 9884	8	1	7	£1,616.96
0007824729	PCB DISPLAY CONTROLLER	NORTEL	7824729	1	0	1	£77.67
0007729369	PCB DLAA	LPS	736465	1	0	1	£368.79
0007823470	PCB DOCU RDR-FML 1-4	NORTEL	7823470	2	0	2	£55.74
0007823466	PCB DOCU RDR-FML 1-4	NORTEL	7823466	2	0	2	£62.10
0007823467	PCB DOCU RDR-FML 1-4	NORTEL	7823467	2	0	2	£55.34
0007822144	PCB DOCUMENT READER FML 1-4	NORTEL	7822144	2	0	2	£56.16
0007734157	PCB DP100A-DS 1/F CONTLR	OFFPTR ASF	956-002-004	18	7	11	£6,008.22
0007762243	PCB DPGA(APA1-CONTROLLER LOCATION AB/12)	LPS 40 NDX	1674170	1	1	0	£526.31
0007725474	PCB DPLB	LPS	382884	22	22	0	£6,628.16
0007771192	PCB DPT SCSI ADAPTOR EISA SCSI-2	MARS DEFAU	PN2122-95	2	0	2	£1,614.00
0007820387	PCB DRAM BOARD	NORTEL	NT30420004	8	8	0	£362.16
0007725612	PCB DRBF	LPS	504858	2	2	0	£288.32
0007757208	PCB DRIVER KX-P4450	OFFPTR P44	PJWP3P4450U	22	21	1	£917.18
0007759480	PCB DRIVER KX-P4450I	OFFPTR P44	PJWP3P4450IU	7	0	7	£251.79
4950043601	PCB DRRB	LPTR	4950043601	5	3	2	£567.85
0007758732	PCB DS SERVO LOGIC MD	MT3	402741502	6	0	6	£2,282.76
4950037401	PCB DSCA	LPTR	4950037401	6	0	6	£615.12
0007762239	PCB DSSAA(APA1-CONTROLLER LOCATION AB/9)	LPS 40 NDX	01164928	1	1	0	£865.58
0007757810	PCB DV07AA DRIVER NO 1	OFFPTR DL5	D16B-9612-0001	27	14	13	£3,652.02
0007756386	PCB E & M	NETWK OSMU	2SUSG00722DFV	1	0	1	£314.42
0007758749	PCB ED OPERATORS PANEL DISPLAY	MT3	410555203	2	1	1	£670.84
0007758812	PCB EI (FITS IN FE PANEL)	MT3	410563504	1	1	0	£217.73
0007713129	PCB ELECT CARD 1 (101A)	KEY EDIT	7713129	1	0	1	£82.66
0007755156	PCB ENGINE DRIVE	OFFPRINTER	G0005100	55	41	14	£10,286.65
0007758748	PCB EO READY/REWIND/CONTROL	MT3	410554302	18	14	4	£54.70
0007758916	PCB EOT/BOT	MTU MTS780	9512081001	2	1	1	£78.74
0007726540	PCB EOT/BOT SENSOR	MTU 60KB	7726540	1	1	0	£637.81
0007731456	PCB EPO RELAY	MTU	7731456	13	4	9	£2,200.00
0007770732	PCB EPS NETWORK LANTRONIX	MARS DEFAU	LANTRONICEPS	4	0	4	£155.30
0007725470	PCB EST	LPS	717614	2	2	0	£270.00
0007772039	PCB ETHERLINK III 3COM ETHERNET ADAPTOR	MARS DEFAU	3C180	3	3	0	£1,560.00
0007772043	PCB ETHERLINK PLUS NETWORK I/F	MARS DEFAU	3C505	3	3	0	£89.00
0007772046	PCB ETHERNET 10-BASE-T 3COM	MARS DEFAU	7772046	1	0	1	£504.45
0007820179	PCB ETHERNET CONTROLLER AOC	NORTEL	7820179	1	0	1	£5,724.68
0007820093	PCB ETHERNET INTELLIGENT CONTROLLER	NORTEL	7820093	6	0	6	£3,171.24
0007820092	PCB ETHERNET PROCESSOR INTEL 552A	NORTEL	ISBC 552A	3	0	3	£10,303.92
0007726739	PCB EVFU	LPTR PBS 3	7726739	22	10	12	£85.51
0007820953	PCB EXTENDER 73870	NORTEL	7820953	1	0	1	£6,716.55
0007739096	PCB FCOAA	LPS 10	1058495	5	3	2	£5,894.42
0007752911	PCB FCOAB	LPS 10	1096532	3	0	3	£420.33
0007725632	PCB FDAS	LPS	549002	1	1	0	£1,421.20
0007725633	PCB FDAT	MEDIA	742252	2	0	2	£975.15
0007729387	PCB FDAU	LPS	S26241-D624-V2	1	0	1	£851.64
0007729410	PCB FDAX	LPS	S26241-D678-V1	4	4	0	£477.00
0007725640	PCB FDAY	MEDIA	560324	2	2	0	£464.14
0007762251	PCB FDCAH(APA1-CONTROLLER LOCATION C/20)	LPS 40 NDX	01205706	1	1	0	£2,610.00
0007765715	PCB FEATURE C EXP 4683 IBM	IBM POS	IBM6110803	15	13	2	£207.46
0007725487	PCB FECE	LPS	536635	1	1	0	£357.06
0007725565	PCB FESA	LPS	519707	2	2	0	£425.50
0007756468	PCB FILTER LINE	LPTR	N203404A	1	1	0	£249.72
0007761719	PCB FLOPPY DISC CONTROLLER CS434	NETWK SERV	MOD070	2	1	1	£5,181.86
0007764850	PCB FM FORMATTER	MTU	B05L-1090-0103A	2	2	0	£84.25
0007823572	PCB FML 11-SEL JUMP-810	NORTEL	7823572	1	0	1	£84.36
0007737562	PCB FMT LAMP UNIT	MTU MTS780	B18B-7390-0210AU	1	0	1	

0007755269	PCB FOBAH S2631D 539X-14	LPS 200	1237012	3	0	0	£2,698.50
0007770262	PCB FORMATTER	MARS DEFAU	C2002-69001	1	0	1	£493.00
0007726535	PCB FORMATTER	MTU 60KB	79250	80	6	74	£79,301.60
0007750137	PCB FP2000 BACKBOARD	LPTX LP200	220892A	1	0	1	£759.46
0005307313	PCB FP6 FRONT PANEL	NETWK CREA	5307313	1	0	1	£96.00
0007762131	PCB FUPAB(IN FUSER STATION/STACKER)	LPS 40 NDX	01857207	6	0	6	£14,983.44
0007732411	PCB FVEAA	LPS 14/2	S26321-D327-X3	3	2	1	£3,402.81
0007725466	PCB FWS	LPS	328235	2	2	0	£401.00
0007821749	PCB FZQN CDC DM80/M	NORTEL	7821749	1	0	1	£294.48
0034901276	PCB G276 STORE	NORTEL	34901276	20	15	5	£6,665.80
0034901361	PCB G361 DATA COUPLER	MPSU	34901361	2	1	1	£2,205.48
0034901365	PCB G365	MTLAN 200	34901365	2	2	0	£5,721.08
0035908378	PCB G370 C/W F/OPTIC CABLEFORM	MCUX	35908378	73	0	73	£39,557.97
0088804437	PCB G437	MCUX	88804437	1	1	0	£313.01
0088804438	PCB G438	MCUX	88804438	4	2	2	£1,302.92
0088800640	PCB G640 INTERCONNECT LINK	MARS DEFAU	88800640	2	0	2	£12.68
0088800675	PCB G675	ME29	88800675	34	20	14	£10,639.62
0088800698	PCB G698 DC CONTROL	ME29	88800698	29	15	14	£8,834.85
0088800711	PCB G711	MTU GTS 47	88800711	1	0	1	£71.95
0088800720	PCB G720 DC CONTROL	MARS DEFAU	88800720	1	0	1	£2.68
0088800751	PCB G751	ME29	88800751	11	0	11	£1,585.98
0088800777	PCB G777	ME29	88800777	11	0	11	£1,908.50
0088800778	PCB G778	MARS DEFAU	88800778	2	0	2	£53.90
0088800803	PCB G803	ME29	88800803	1	0	1	£114.36
0088800812	PCB G812	ME29	88800812	13	5	8	£1,819.09
0088800878	PCB G878 OSLAN I/F	NTWKOSLN	88800878	11	0	11	£3,909.18
0005310280	PCB G924 ASSY LESS FROM SET	NETWK PILA	5310280	8	3	5	£1,916.72
0005311338	PCB G938	NETWK PILA	5311338	18	0	18	£1,227.06
0005312573	PCB G973	MCU1	5312573	7	2	5	£1,044.05
0005312584	PCB G984	NTWKOSLAN	5312584	4	2	2	£232.04
0005315174	PCB G986 + G995 LESS PROM	NTWKOSLAN	5315174	3	0	3	£4,176.03
0005312587	PCB G987	NTWKOSNET	5312587	8	7	1	£5,568.00
0007814178	PCB GCPU	MARS DEFAU	85UPB20004AADPCS1	3	0	3	£495.00
0007738926	PCB GENERATOR FREQUENCY S2631E74V13	LPS 10	1093185	3	1	2	£5,431.56
0007754608	PCB GHPAA S2631D421 -13	LPS ND3	1239678	2	0	2	£642.84
0007725621	PCB GPAA	LPS	1055987	4	2	2	£3,776.08
000772322	PCB GRAP ISA 1MB (UPTO 2MB) CLONE	MARS DEFAU	7772322	2	0	2	£140.00
0007820175	PCB GRAPHICS ADAPTER MONO EUROPE	NORTEL	06920033	6	1	5	£863.10
0007751620	PCB H-2 MAIN I/F	OFFPTR 160	7751620	2	2	0	£350.48
0007822331	PCB H S PRINTER FML 11	NORTEL	7822331	2	0	2	£55.16
0007822291	PCB H S PRINTER FML 5-	NORTEL	7822291	2	0	2	£63.76
0007822317	PCB H S PRINTER WAS 81006	NORTEL	NT81006342	1	0	1	£32.43
0007820237	PCB HAMMER CONTROL	NORTEL	NTD2743951	3	0	3	£1,638.75
0007713718	PCB HAMMER DRIVER	LPTX	7713718	1	1	0	£223.66
4901154021	PCB HAMMER DRIVER	LPTX	4901154021	1	0	1	£307.20
4901363481	PCB HAMMER DRIVER	LPTX	4901363481	2	0	2	£360.76
0007733404	PCB HAMMER DRIVER	LPTX LW40	44694150-4001	89	0	89	£49,654.88
0007715380	PCB HAMMER DRIVER	LPTX PBS36	44687338	59	17	42	£31,344.34
0007820194	PCB HAMMER DRIVER 30XXCOMM	NORTEL	251165-002	12	0	12	£5,163.24
4901154044	PCB HAMMER TIMING	LPTX	50469701	10	1	9	£3,863.10
4901154070	PCB HAMMER TIMING 55/56	LPTX	50469702	10	2	8	£3,132.10
0007725672	PCB HASL	LPS	537292	28	26	2	£21,987.56
0007758029	PCB HC081	NIP PP240	N204563A	1	1	0	£17.71
0007728048	PCB HD 75 IPS	MTU GTS 47	401221308	20	13	7	£7,176.20
0007728058	PCB HD CD 125 IPS	MTU GTS 47	400521309	10	1	9	£3,618.10
0007728047	PCB HD CD 50IPS	MTU GTS 47	401220308	2	2	0	£932.36
0007750316	PCB HD081 HAMMER DRIVER 160PP	LPTX LP200	111127A	17	1	16	£13,356.05
0007752445	PCB HD112 HAMMER DRIVER	LPTX	N100728A	9	2	7	£7,747.47
0007750133	PCB HD091 HAMMER DRIVER 132PP	LPTX LP200	111183A	21	5	16	£13,563.90

0007758929	PCB HEAD AMP	MTU MTS780	9512458102	4	3	1	£534.32
0007820302	PCB HEAD ASSY DOWN CDC-DMBDM	NORTEL	NT75010102	5	5	0	£926.50
0007725629	PCB HLAE	LPS	7725629	18	11	7	£3,751.74
0007725630	PCB HLAJ	LPS	528633	1	1	0	£302.94
0007731100	PCB HLP A	OFFPTR ML8	7731100	153	0	153	£24,342.30
0007731129	PCB HLP S-2	OFFPTR ML8	LY-43361-2	1	0	1	£67.58
0007731114	PCB HLSW	OFFPTR ML8	LY-43359	18	11	8	£335.54
0007752755	PCB HOST ADAPTER	NTWKOSPAC	F-0013-0	2	0	2	£2,523.22
0007725549	PCB HRAB	LPS	514799	2	2	0	£609.98
0007738927	PCB HVGAA PSU LASER	LPS 10	1095048	4	1	3	£19,187.60
0007726927	PCB HX	MTU	403648203	22	5	17	£6,819.12
0007751922	PCB HYTYPE 2 I/F INC MCODE	OFFPTR	M14880-2010	5	4	1	£1,334.00
0007722717	PCB HZAB	LPS	1093169	5	4	1	£1,689.85
0007730667	PCB I/F	LPTR	7730667	8	0	8	£478.00
0007730203	PCB I/F	OFFPTR R16	7730203	28	25	3	£4,854.92
0007751389	PCB I/F	OFFPTR GP17	50667004	7	7	0	£362.88
0007727570	PCB I/F ADAPTOR CARD	OFFPTR LX1	52531 UK	17	9	8	£1,012.52
0007727569	PCB I/F ADAPTOR CARD	OFFPTR LX2	55251UK	4	3	1	£46.36
0007755761	PCB I/F CENTRONICS	OFFPTR 402	140K04890	1	0	1	£95.39
0007755295	PCB I/F CENTRONICS	OFFPTR ML2	7755295	14	3	11	£2,436.00
0007761709	PCB I/F CONN COMPLETE	OFF PTR	PJWP2P4455U	4	4	0	£130.28
0007757141	PCB I/F CONN KX-P4450	OFFPTR P44	PJWP4P4450M	13	6	7	£398.24
0007759478	PCB I/F CONN KX-P4450I	OFFPTR P44	PJWP4P4450IU	4	0	4	£124.36
0007737589	PCB I/F CONTROL MTU	MTU MTS780	C16B-5324-0030JU	8	5	3	£3,620.64
0007750988	PCB I/F CONTROLLER ADAPTOR BOX	LPTR	M14901-1010	1	0	1	£815.48
0007739260	PCB I/F DP-150 REV C	OFFPTR ASF	350-074-513	2	2	0	£250.42
0007732532	PCB I/F FOR 00711201	OFFPTR R13	7732532	4	4	0	£1,937.68
000770288	PCB I/F MIO	MARS DEFAU	28644-69002	1	0	1	£321.32
0007771624	PCB I/F PARALLEL MT131/24	MARS DEFAU	046280	1	0	1	£88.00
0007757406	PCB I/F PERSONALITY	LPTR	44694202	1	1	0	£676.25
0007754465	PCB I/F RS232C	OFFPTR 402	140K04800	1	0	1	£209.42
0007730668	PCB I/O	LPTR	7730668	3	0	3	£315.54
4901154066	PCB I/O	LPTR	59635101	9	2	7	£3,427.83
0007751086	PCB I/O ADAPTOR	LPTR	44692029	1	1	0	£189.89
0007750322	PCB I/P PWR BRD 360X50HZ	LPTR LW40	44690411	82	0	82	£18,898.12
0007773374	PCB IBM Y	MARS DEFAU	72X8287	1	0	1	£0.01
0007764861	PCB IC (PSU BOARD)	MTU	B17B-0160-0070AUJ	3	3	0	£1,326.24
0007715516	PCB ICL PBS INFACE BD AS	LPTR PBS36	44691795	34	11	23	£28,737.08
0007756812	PCB ICL UK SPECIAL IBM PAYLESS	OFFPTR ML2	PM2941	14	10	4	£2,260.58
0007754629	PCB IFAAF S26311D471 -10	LPS ND3	01169246	1	0	1	£1,663.01
0007734246	PCB IMAGE CONTROL (LESS EPROM)	OFFPTR ML8	IM850	8	0	8	£1,831.44
0007824810	PCB INDICATOR ASSY	NORTEL	NT30650033	8	8	0	£198.88
4901338942	PCB INPUT CONTROL	LPTR	4901338942	2	2	0	£416.72
0007713731	PCB INPUT CONTROL 2	LPTR	7713731	1	1	0	£173.07
0007770091	PCB INTEGRATOR I/F CARD ISDN-B	NTWRK	UK-INTEG-PICO-HW-IS-BA	2	2	0	£928.00
0007767656	PCB INTERFACE	MT908	393857	2	2	0	£150.00
0007759680	PCB INTERFACE AK	OFFPTR MT9	7759680	1	0	1	£97.73
0007732443	PCB ISAC	LPS 14/2	S2611-D498-1	1	1	0	£226.06
0007732438	PCB ISAD	LPS 14/2	S26241-D540-8	2	2	0	£288.78
0007732442	PCB ISAE	LPS 14/2	S26241-D596-1	9	9	0	£1,809.00
0007726928	PCB JA PRE AMP	MTU GTS 47	7726928	10	6	4	£1,746.10
0007759681	PCB JADE CONTROLLER	OFFPTR MT9	075641	5	5	0	£2,078.00
0007726926	PCB JF	MTU GTS 47	401224201	16	7	9	£1,755.52
0007726920	PCB JH	MTU GTS 47	401699203	14	0	14	£5,183.22
0007726921	PCB JJ2	MTU GTS	7726921	9	2	7	£1,601.64
0007731605	PCB JJ2M	MTU GTS	7731605	119	13	106	£28,586.18
0007726922	PCB JK	MTU GTS 47	7726922	3	0	3	£945.60
0007730179	PCB JK OSC4	MTU	401595202	1	0	1	£192.18
0007726923	PCB JL	MTU GTS 47	43106506	8	2	6	£1,463.52

0007726924	PCB JP	MTU GTS 47	43107410	11	3	8	£1,519.87
0007726925	PCB JS	MTU GTS 47	401227303	13	12	1	£1,764.75
0007725522	PCB JTA	LPS	465313	2	2	0	£273.48
0007730686	PCB JW TRIDENSITY	MTU	40648201	2	2	0	£564.68
0088808367	PCB KBRD CONTROLLER	MTS	88808367	2	0	2	£47.56
0007756389	PCB K30 SYNC/ASYNC HORIZ	NETWK OSMU	350-2205-005	1	0	1	£260.13
0088808368	PCB K368 RS232 I/F	MTS	88808368	1	0	1	£57.13
0088808523	PCB K523	LPTR	88808523	1	0	1	£189.14
0088808529	PCB K529 COMMS I/F(V11)	MCU MK3 X	88808529	2	1	1	£319.32
0007730683	PCB KD	MTU	43304206	2	2	0	£288.92
0007727003	PCB KD	MTU GTS 47	7727003	5	3	2	£1,775.30
0007732029	PCB KE (YA MICROCODE)	MTU GTS	43305411	5	1	4	£1,675.40
0007730684	PCB KE TRI-D SX	MTU	402540201	1	1	0	£352.36
0007727004	PCB KEJ (PE/GCR OPTIONAL)	MTU GTS 47	7727004	2	0	2	£713.56
0007730685	PCB KF	MTU	43306306	2	1	1	£452.82
0007730085	PCB KG	MTU	43307507	12	2	10	£3,693.24
0007727006	PCB KG	MTU GTS 47	7727006	1	0	1	£277.25
0007730086	PCB KH	MTU	43308404	71	5	66	£34,069.35
0007732431	PCB KIAA	LPS 14/2	S26241-D538-12	1	1	0	£157.85
0007732432	PCB KIAB	LPS 14/2	S26241-D538-4	1	1	0	£102.63
0007730087	PCB KK	MTU	43309405	5	0	5	£1,079.95
0007727016	PCB KK	MTU GTS 47	43309404	6	2	4	£2,073.54
0007727019	PCB KL	MTU GTS 47	43318304	2	2	0	£77.42
0007727008	PCB KM	MTU GTS 47	43310201	5	4	1	£2,348.60
0007727009	PCB KN	MTU GTS 47	43311202	6	5	1	£2,455.68
0007725575	PCB KOAB	LPS	380288	16	15	1	£8,563.36
0007725576	PCB KOAC	LPS	380296	2	2	0	£276.38
0007732434	PCB KOAE	LPS 14/2	S26241-D530-12	1	1	0	£252.49
0007725577	PCB KOAH	LPS	380326	3	2	1	£536.76
0007725578	PCB KOAJ	LPS	380334	2	2	0	£786.72
0007725579	PCB KOAK	LPS	380342	1	1	0	£275.20
0007725566	PCB KOAM	LPS	514829	2	2	0	£266.68
0007725622	PCB KOAN	LPS	521310	1	1	0	£143.70
0007732433	PCB KOAQ	LPS 14/2	S26241-D601-1	1	1	0	£200.50
0007727010	PCB KP	MTU GTS 47	43312305	6	6	0	£931.08
0007727011	PCB KQ	MTU GTS 47	7727011	3	0	3	£818.10
0007727012	PCB KR	MTU GTS 47	401529301	6	3	3	£936.36
0007733625	PCB KT	MTU	43315613	14	3	11	£5,599.72
0007727013	PCB KT	MTU GTS 47	7727013	6	6	0	£2,480.78
0007727014	PCB KV	MTU GTS 47	43316707	7	4	3	£3,625.51
0007754626	PCB LBFAA S26311D436V1-6	LPS ND3	1150316	1	0	1	£802.08
0007763589	PCB LCH CONTROLLER	LPS PP250	B17B-0140-0840AU	4	4	0	£2,054.96
0007752914	PCB LD CONTROL	OFFPRINTER	53535609	40	39	1	£4,372.00
0007763026	PCB LD LMU	MTU RCS	410244301	1	1	0	£282.37
0007725478	PCB LDMA	LPS	382830	4	4	0	£400.52
0007725479	PCB LDMB	LPS	382949	1	1	0	£91.17
0007722712	PCB LEOA S26311D258X -3	LPS	577235	1	0	1	£47.23
0007739385	PCB LEPV-11	OFFPTR ML8	LY-41565-11	56	5	51	£7,018.48
0007739386	PCB LEPV-12	OFFPTR ML8	7739386	147	19	128	£17,860.50
0007729530	PCB LEPW-2 POWER	OFFPTR ML8	LX-86727-2	27	17	10	£467.91
0007729656	PCB LEPW3	OFFPTR ML8	LX-86727-3	1	0	1	£14.65
0007729670	PCB LEPW4	OFFPTR ML8	LX-86727-4	20	7	13	£351.40
0007823537	PCB LG SCR -DISPLAY FM	NORTEL	7823537	1	0	1	£681.59
0007754618	PCB LIBAC S26311D520V1-7	LPS ND3	01895975	5	1	4	£4,935.10
0007813757	PCB LLI	MARS DEFAU	85UPB20007AAA	44	0	44	£12,668.04
0007731232	PCB LOGIC	LPTR PB144	7731232	6	4	2	£1,439.10
0007820276	PCB LOGIC	NORTEL	7820276	1	0	1	£48.00
0007820409	PCB LOGIC	NORTEL	NT21530147	2	1	1	£510.30
0007770897	PCB LOGIC	OFFPTR	PJWPP4430U	5	4	1	£3,261.50

0007824834	PCB LOGIC-MT490	NORTEL	027647	4	4	0	£3,380.88
0007820040	PCB LOGIC - 036042	NORTEL	036042	8	2	6	£6,208.64
0007824720	PCB LOGIC ATC186	NORTEL	ACO 9888-24	29	0	29	£5,541.61
0007822219	PCB LOGIC BISYNC FML	NORTEL	NT81003505	1	0	1	£93.45
0007820118	PCB LOGIC BISYNC FML	NORTEL	NT81002344	1	1	0	£103.61
0007823493	PCB LOGIC BOARD-POWER SUPPLY	NORTEL	7823493	1	0	1	£91.22
0007822187	PCB LOGIC BRIDGE C/RE	NORTEL	7822187	2	0	2	£51.76
0007765725	PCB LOGIC C/W PCBs 3683 IBM	IBM POS	7765725	2	1	1	£255.64
0007822342	PCB LOGIC FEEDBACK OD3	NORTEL	7822342	2	0	2	£48.64
0007822220	PCB LOGIC H S PRINTER	NORTEL	7822220	2	0	2	£75.52
0007726307	PCB LOGIC LX113	OFFPTR LX1	785080	5	5	0	£112.85
0007726308	PCB LOGIC LX213	OFFPTR LX2	7726308	19	9	10	£9,760.30
0007820280	PCB LOGIC MDL77	NORTEL	NT81006991	5	0	5	£330.00
0007820279	PCB LOGIC MDL77	NORTEL	NT81006911	3	2	1	£319.26
0007822282	PCB LOGIC MODEL 73	NORTEL	7822282	1	0	1	£93.37
0007822210	PCB LOGIC MODEL 73 KE	NORTEL	NT81003131	1	0	1	£59.31
0007820031	PCB LOGIC PARALLEL	NORTEL	NT10180037	2	1	1	£969.98
0007822194	PCB LOGIC PRINTER FML	NORTEL	NT81002563	2	0	2	£39.38
0007822193	PCB LOGIC PRINTER FML	NORTEL	NT81002552	2	0	2	£48.70
0007822192	PCB LOGIC PRINTER FML	NORTEL	NT81002542	4	0	4	£63.80
0007822190	PCB LOGIC PRINTER FML	NORTEL	7822190	2	0	2	£130.76
0007822195	PCB LOGIC PRINTER 600	NORTEL	7822195	4	1	3	£1,642.08
0007820032	PCB LOGIC SERIAL	NORTEL	7820032	4	2	2	£3,419.68
0007820222	PCB LONG LIFE I/F	NORTEL	267570-001	3	2	1	£888.06
0007820200	PCB LONG LINE I/F	NORTEL	257240-002	1	0	1	£326.10
0007753254	PCB LPE 4 CHANNEL RS449	NTWKOSPAC	F-0059-0	1	0	1	£811.03
0007753252	PCB LPM 2 CHANNEL RS232	NTWK	F-0054-0	2	2	0	£4,280.44
0007753253	PCB LPM 2 CHANNEL RS449	NTWKOSPAC	F-0056-0	5	4	1	£10,701.10
0007753251	PCB LPM 2 CHANNEL V35	NTWKOSPAC	F-0055-0	3	3	0	£6,420.66
0007760142	PCB LQEW-2 SENSOR	OFFPTR 393	4YA4042-1462G2	7	5	2	£250.74
0007758843	PCB LOPH I/F CONN	OFFPTR ML3	4YA4042-1293G12	6	0	6	£490.80
0007758844	PCB LOSW OPERATION	OFFPTR ML3	4YA4042-1299G1	7	2	5	£217.14
0007722698	PCB LRAB	LPS	582301	1	0	1	£701.70
0007732448	PCB LRGAC	LPS 14/2	1065360	1	1	0	£740.10
0005306175	PCB LS0180	NETWK CREA	5306175	3	2	1	£2,147.70
0005306651	PCB LS0380	NETWK CREA	5306651	1	0	1	£870.02
0007725602	PCB LSLB	LPS	380679	1	1	0	£120.15
0007725603	PCB LSLD	LPS	380695	3	3	0	£338.30
0007725628	PCB LSLK	LPS	328617	2	2	0	£265.54
0007768176	PCB LXHI (RS232 I/F)	OFFPTR	IFF390	6	0	6	£258.72
0007763013	PCB LZ	MTU RCS	410250514	1	1	0	£1,815.18
000772144	PCB M/BOARD (DX4) AST BRAVO LC	MARS DEFAU	7772144	3	2	1	£2,100.00
000772006	PCB M/BOARD 256/640KB (XT-5160)	MARS DEFAU	IBM6489806	1	0	1	£45.00
000771144	PCB M/BOARD P75 (0mb + NO CPU) PREMMIA MX	MARS DEFAU	202637-XXX	9	8	0	£3,654.00
4901915301	PCB M001 PSU	MARS DEFAU	4901915301	22	12	10	£2,056.56
0007767104	PCB M2482 AUTO CASSETTE LOADER	MTU	B17B-1540-0230A	1	0	1	£596.53
0007759680	PCB M34 HIGH SPEED X21	NETWK OSMU	32UPB00302DEA	2	1	1	£1,433.76
0007725493	PCB MAAQ	LPS	564281	2	2	0	£337.62
0007725509	PCB MAAR	LPS	464473	3	3	0	£578.22
0007820266	PCB MAG TAPE	NORTEL	NT81005580	1	1	0	£141.76
0007820273	PCB MAG TAPE	NORTEL	NT81005613	1	1	0	£219.16
0007756740	PCB MAIN	OFFPTR TTP	7756740	5	5	0	£388.60
0007820299	PCB MAIN ASSY DRIVER	NORTEL	NT241630-3	2	0	2	£1,142.12
0007765682	PCB MAIN BOARD	KX-P4451	PJWPP4451U	13	6	7	£9,033.83
0007750861	PCB MAIN ICL-SIF	OFFPTR 150	7750861	49	14	35	£9,575.58
0007761702	PCB MAIN LOGIC 240V	OFF PTR	PJWP1P4455U	5	4	1	£4,901.75
0007757175	PCB MAIN LOGIC 240V KX-P4450	OFFPTR P44	PJWP1P4450U	44	29	15	£23,883.32
0007820043	PCB MAIN LOGIC AT084	NORTEL	7820043	6	6	0	£3,209.94
0007760145	PCB MAIN LQEM-4	OFFPTR 393	4YA4042-1460G14	14	0	14	£3,198.72

0007751535	PCB MAIN MOTOR DRIVE	OFFPRINTER	53535303	19	17	2	£1,176.29
0007733338	PCB MAIN S-I/F	OFFPTR R16	77333338	8	3	6	£2,600.81
0007759901	PCB MAM 4MB	NTWKOSPAC	F-0108-0	1	0	1	£2,252.86
0007725596	PCB MBAA	LPS	380598	1	1	0	£147.40
0007725510	PCB MBAD	LPS	517135	12	12	0	£1,905.96
0007725495	PCB MBAE	LPS	999897	2	2	0	£452.12
0007725610	PCB MBAJ	LPS	401498	2	2	0	£716.76
0007725559	PCB MBAM	LPS	526606	2	2	0	£346.10
0007725568	PCB MBAN	LPS	539724	2	2	0	£401.00
0007725626	PCB MBAP	LPS	531324	3	3	0	£690.66
0007739179	PCB MC345AA SCDC	MARS DEFAU	MC345AA	2	0	2	£4,021.50
0007722675	PCB MCPA	LPS	826693	1	0	1	£144.14
0007729365	PCB MDAP	LPS	793388	2	2	0	£599.94
0007725547	PCB MDAP	MEDIA	793302	8	8	0	£2,177.20
0007767660	PCB MECHANICAL CONTROLLER	MT908	393859	3	3	0	£381.99
0007759682	PCB MECHANICAL CONTROLLER	OFFPTR MT9	730233	2	0	2	£180.78
0007759626	PCB MEMORY 0 5MB SMARTNET 4000	NTWKOSPAC	4002-000	1	0	1	£811.03
0007759687	PCB MEMORY 1MB OSPAC MODEL 20	NTWKOSPAC	4002-001	5	3	2	£4,383.05
0007752803	PCB MEMORY 4 MEGABYTE	NTWK	F-0048-0	1	0	1	£10,813.74
0007756572	PCB MEMORY MODULE	NTWKOSPAC	7756572	2	1	1	£337.96
0007725571	PCB MERG	LPS	00848123	1	1	0	£200.49
0080062940	PCB MEZZANINE I/F XIM-DG	IMAGE	80062940	3	3	0	£828.24
0080062941	PCB MEZZANINE I/F XIM-FG	IMAGE	80062941	2	2	0	£429.20
0007763022	PCB MF	MTU RCS	410214304	1	1	0	£214.17
0007761950	PCB MG	MTU RCS	410190402	1	1	0	£143.21
0007733958	PCB MIA	NTWKPRINT	1512 32 50-100	37	0	37	£16,181.21
0007727689	PCB MICROPROC CONTROLLER	LPTR P8S 3	7727689	25	10	15	£19,381.00
0007731203	PCB MICROPROCESSOR	LPTR PB144	44688333	17	3	14	£11,608.79
0007820327	PCB MINI DISC CONTROLLER	NORTEL	180730-6	6	0	6	£1,866.06
0007814970	PCB MLIN	MARS DEFAU	4YA4042-1062G1	2	0	2	£287.62
0007754623	PCB MMCA S26311D383X -8	LPS ND3	1151142	1	0	1	£1,498.59
0007758071	PCB MMU	NIP PP240	71011910-002	7	5	2	£38,606.75
0007755271	PCB MMYAA S26311D 490V4-1	LPS 200	1110721	1	0	1	£839.17
0007762000	PCB MMYAA(STORE-APA1 CONTR LOCATION C11-14)	LPS 40 NDX	01201964	1	1	0	£537.37
0007762042	PCB MMYAA(STORE-APA1 CONTROLLER LOCATION C5-10)	LPS 40 NDX	01202901	1	1	0	£660.65
0007761830	PCB MOD OSLAN 200 LINE CARD	NTWKOSLAN	1201-400-X02-1	2	0	2	£756.32
0007761828	PCB MOD OSLAN 300 LINE CARD ST	NTWKOSLAN	1201-8-ICL	1	0	1	£414.12
0007822281	PCB MODE 73-14IN FML 01	NORTEL	7822281	1	0	1	£42.91
0007822289	PCB MODEL BRISGE FML 3-	NORTEL	7822289	4	1	3	£258.96
0007819505	PCB MODEM AA 1950 RACK MOUNTED	MODMIAL	195002	3	0	3	£643.83
0080061155	PCB MODEM OS6032R V32M33 A/A RACK MOUNTED	MODM	350-4030-005	85	13	72	£55,216.00
0007752177	PCB MODEM V26	MODM	S82426DR	1	1	0	£323.67
0080061250	PCB MODULAR OSLAN 100 LINE CARD	NTWKOSLAN	1201-000-X02-1	5	0	5	£2,849.50
0007824821	PCB MON TEXT ADAPTOR	NORTEL	7824821	1	0	1	£49.99
0007822304	PCB MONITOR 14IN BISYNC FML	NORTEL	7822304	1	0	1	£27.93
0007822303	PCB MONITOR 14IN BISYNC FML	NORTEL	7822303	1	0	1	£72.83
0007822298	PCB MONITOR 14IN SYNC	NORTEL	NT81005135	1	0	1	£133.90
4901154036	PCB MOS MEMORY	LPTR	47787901	9	1	8	£4,365.09
0007820196	PCB MOTHER	NORTEL	251190-001	1	0	1	£141.59
0007726306	PCB MOTHER BD LX213	OFFPTR LX1	7726306	5	2	3	£356.30
0007751920	PCB MOTHER BRD	OFFPTR	MIA800-3090	2	2	0	£104.40
0007728661	PCB MOTHERBOARD	MTU GTS 47	40009303	1	0	1	£178.94
0007732941	PCB MOTHERBOARD	MTU MTS61M	108700	72	6	66	£34,907.04
0007724544	PCB MOTHERBOARD CONTROL UNIT TYPE 2	OFFPTR QUM	90712-02	1	0	1	£251.34
0007766059	PCB MOTHERBOARD PROLINEA 486DX2/66 LOCAL BUS	MT3	404532201	3	3	0	£6,536.19
0160178001	PCB MOTHERBOARD WITHOUT PC/MIA THINKPAD 350C.1B	MARS DEFAU	160178-001	2	1	1	£1,790.00
0007775524	PCB MOTOR AMPLIFIER	MARS DEFAU	7775524	2	2	0	£1,500.00
0007728331	PCB MOTOR CONTROL B	OFFPTR LX2	7728331	13	9	4	£6,122.87
0007728624	PCB MOTOR CONTROL B	MICROPOLIS	100472-01-8	42	19	23	£14,022.12

0007763588	PCB MOTOR DRIVER	LPS PP250	B17B-0140-0830AJU	5	3	2	£2,779.20
0007768361	PCB MPU	MARS DEFAU	309805301	2	0	2	£3,944.16
0007750146	PCB MS011 MECH SENSOR	LPTR LP200	220973A	11	5	6	£8,991.40
0007756381	PCB MUX CONTROLLER	NETWK OSMU	25UMU00722DBR	4	2	2	£2,050.88
0007770517	PCB MV	MTU RCS	404811508	1	0	1	£538.52
0007770515	PCB MW	MTU RCS	404514302	1	1	0	£303.06
0007754612	PCB MXMAC S2631D399V2	LPS ND3	1019015	2	1	1	£1,761.42
0007754619	PCB MXMAF S2631D540X -9	LPS ND3	1699265	3	0	3	£3,357.93
0007763016	PCB NB	MTU RCS	410279302	1	1	0	£145.36
0007761976	PCB ND	MTU RCS	410640201	1	1	0	£59.35
0007726313	PCB NEEDLE AMPLIFIER Z10	OFFPTR LX1	403780	9	3	6	£899.82
0007752756	PCB NETWORK COMMS PROCESSOR FOR CPA ONLY	NTWKOSPAC	7752756	6	1	5	£21,627.48
0007757835	PCB NETWORK CONTROLLER	MODM	130/NT160002-107B	4	4	0	£2,213.32
0007820177	PCB NT DISPLAY CONTROLLER	NORTEL	AC40010	29	8	21	£2,678.44
0007824630	PCB NT DISPLAY CONTROLLER (V1144)	NORTEL	15972024	3	0	3	£174.00
0007725593	PCB OCAA	LPS	573132	2	2	0	£355.38
0007725594	PCB OCAB	LPS	732877	1	1	0	£152.23
0007725595	PCB OCAC	LPS	380571	1	1	0	£118.20
0007722711	PCB OCDA S2631D27X -8	LPS	1113828	3	0	3	£216.15
0007756575	PCB OCTAL CAM DCE	NTWKOSPAC	2022-000	1	0	1	£168.97
0007756574	PCB OCTAL CAM DTE	NTWKOSPAC	2021-000	3	1	2	£473.10
0007756573	PCB OCTAL CEM	NTWKOSPAC	2023-000	12	0	12	£4,190.28
0007823521	PCB ODEC-CONT BUFFER	NORTEL	NT81004491	1	0	1	£34.14
0007822279	PCB ODEC HAMMER DRIVER A6	NORTEL	7822279	4	1	3	£239.56
0007822274	PCB ODEC INTF 64/96	NORTEL	7822274	1	0	1	£35.86
0007822277	PCB ODEC REGIST 48/96	NORTEL	7822277	1	0	1	£68.17
0007738931	PCB OMLAA	LPS 10	1073745	2	1	1	£1,228.38
0007754633	PCB OMPAA	LPS ND3	1119729	1	0	1	£1,111.88
0007737587	PCB OP CONTROL PANEL FMT	MTU MTS780	B16B-9810-0010A	5	2	3	£1,063.45
0007758588	PCB OPERATION LXSP	OFFPTR ML3	4YA4021-1048G1	11	1	10	£332.31
0007758525	PCB OPERATION LXSP-2	OFFPTR ML3	4YA4021-1048G2	3	0	3	£47.94
0007760125	PCB OPERATION LXSP-5	OFFPTR	7760125	11	10	1	£266.42
0007750853	PCB OPERATION PANEL	OFFPTR 150	7750853	24	21	3	£1,222.80
0007729504	PCB OPERATOR PANEL	OFFPTR ML8	LY-40069	105	56	49	£1,961.40
0007734105	PCB OPTION D25	OFFPTR ASF	7734105	19	14	5	£707.56
0007728219	PCB OSC HORIZ + VERT	LPTR PBS 3	44880656	13	10	3	£6,263.53
0007722676	PCB OSCA	LPS	7722676	1	0	1	£1,014.29
0088808651	PCB OSLAN INTERFACE PP250	LPS PP250	88808651	20	17	3	£6,119.20
0007730060	PCB OVLAA S26313D 33X -6	LPS	1082965	3	1	2	£1,725.30
0088800041	PCB P041 DATA LOW	ME29	88800041	22	11	11	£8,529.62
0088800042	PCB P042 DATA HIGH	ME29	88800042	12	7	5	£7,240.80
0088800049	PCB P049 CONTROL STORE	ME29	88800049	17	2	15	£4,753.03
0088800050	PCB P050 H3	ME29	88800050	15	7	8	£7,050.00
0088800052	PCB P052 DIAGNOSTIC	ME29	88800052	18	8	10	£8,213.76
0088800097	PCB P097	ME29	88800097	15	4	11	£11,263.50
0088822611	PCB P226	ME29	88822611	27	0	27	£17,071.02
0088800300	PCB P300 (2900 PERIF IF)	MARS DEFAU	88800300	4	0	4	£480.00
0088800303	PCB P303 (RECLAIM) MICRO PROCESSOR	MARS DEFAU	88800303	13	3	10	£1,809.60
0088800304	PCB P304 (ENGINEERS)	MTU	88800304	7	2	5	£840.00
0088800305	PCB P305	MTU	88800305	9	3	6	£4,110.03
0088800327	PCB P327 MAINSTORE	ME29	88800327	78	18	60	£3,234.66
0088800353	PCB P353	ME29	88800353	15	6	9	£9,004.95
0088800355	PCB P355	ME29	88800355	23	14	9	£6,931.51
0088800356	PCB P356	ME29	88800356	5	2	3	£1,104.85
0088803509	PCB P509	ME29	88803509	28	8	20	£15,174.88
0088803524	PCB P524	ME29	88803524	10	0	10	£6,140.70
0088803525	PCB P525	ME29	88803525	21	7	14	£13,452.39
0088803526	PCB P526	ME29	88803526	18	7	11	£13,625.82
0088803528	PCB P528	ME29	88803528	10	5	5	£9,397.40

008803529	PCB P529	ME29	88803529	10	7	3	£11,743.60
008803530	PCB P530	ME29	88803530	24	15	9	£11,539.68
008803531	PCB P531 (64K CHIP)	ME29	88803531	29	21	8	£11,141.22
008803549	PCB P549	MTU GTS 47	88803549	4	0	4	£556.80
008803570	PCB P570 (RECLAIM) 2800 PERIF 1/IF	MTU	88803570	2	1	1	£278.40
008803582	PCB P582 512KB MAIN STORE 128KB RAM FOR ME2	ME29	88803582	8	6	2	£10,761.84
008803583	PCB P583 (RECLAIM ONLY)	ME29	88803583	2	0	2	£670.54
008800954	PCB P954	ME29	88800954	21	10	11	£20,124.51
0007765445	PCB PACAB	LPS 40 (ND)	1752885	2	0	2	£2,912.40
0007754586	PCB PADAE	LPS ND3	1189450	1	0	1	£216.84
4901154024	PCB PAPER DRIVE	LPTR	4901154024	26	4	22	£7,727.72
0007820224	PCB PAPER FEED	NORTEL	270130-003	1	1	0	£414.86
4901154063	PCB PAPER MOTION 53/54	LPTR	59652600	12	0	12	£2,298.48
4901154064	PCB PAPER MOTION 55/56	LPTR	4901154064	11	2	9	£2,283.49
0007820657	PCB PARITY EXT - 405/445	NORTEL	7820657	1	0	1	£73.80
0007726172	PCB PAS38	LPS	789908	2	1	1	£519.46
0007771518	PCB PASSTRHU	MTU ATL288	309807801	1	1	0	£883.94
0007762111	PCB PAWAE-SENSOR(IN PAPER TRANSPORT)	LPS 40 NDX	01175939	1	0	1	£56.80
0007824911	PCB PC LINK2 NETWORKING	NORTEL	15972021	9	0	9	£2,897.73
0007771721	PCB PC/XT TSD INTERFACE CARD OIC-02 MAYNARD	MARS DEFAU	OIC02-GA	3	1	2	£435.00
0007768585	PCB PC1050 I/FACE FOR M300-05 CONTROLLER	ORSS00	497568	14	11	3	£1,680.00
0007752447	PCB PCI UNIT	LPTR	N100865A	7	3	4	£5,977.79
0007762135	PCB PCIAG(IN MAINS INTERFACE)	LPS 40 NDX	01732960	3	0	3	£1,424.16
0007770427	PCB PCIAI	LPS 40 (ND)	1902652	1	0	1	£689.52
0007738953	PCB PCOAB S26311D	LPS 10	1107941	1	0	1	£344.85
0007752444	PCB PD041	LPTR	N201682A	4	0	4	£1,714.08
0007756694	PCB PD051 RH CONSULE	LPTR	N101269A	7	6	1	£1,346.24
0007762125	PCB PDAA(IN PAPER TRANSPORT)	LPS 40 NDX	1684647	2	0	2	£965.76
0007738932	PCB PDHAA	LPS 10	1187392	1	1	0	£1,212.51
0007754613	PCB PDHAC S26311D505V1-0	LPS ND3	1178926	11	3	8	£10,762.07
0007756393	PCB PDMX POWER 6AMP	NETWK OSMU	7756393	1	0	1	£324.22
0007754785	PCB PERSONALITY CENTRONICS ICL STEP 2	OFFPTR ML2	7754785	1	0	1	£45.24
0007758910	PCB PERSONALITY EPSON LQ	OFFPTR ML3	19050001	2	0	2	£69.60
0007759686	PCB PERSONALITY MODULE OSPAC MODEL 20	NTWKOSPAC	3019-002	1	0	1	£67.59
0007770505	PCB PLE (LED LAMPS)	MTURCS	308405302	1	1	0	£224.74
0007770521	PCB PLR	MTURCS	308401504	1	1	0	£405.82
0007770520	PCB PMC	MTURCS	308423303	1	1	0	£236.37
0007762242	PCB PMCAA(APA1-CONTROLLER LOCATION AB/11)	LPS 40 NDX	01133772	1	1	0	£573.72
0007762247	PCB PMIAA(APA1-CONTROLLER LOCATION AB/17)	LPS 40 NDX	01155598	1	1	0	£605.86
0007725546	PCB PMOA	LPS	920177	2	2	0	£276.56
0007754592	PCB POSAB	LPS ND3	1106236	1	0	1	£200.52
0007820207	PCB POWER	NORTEL	263040-001	1	1	0	£320.28
000782364	PCB POWER	OFFPTR 160	7752364	11	8	3	£3,128.51
0007730204	PCB POWER	OFFPTR R16	7730204	31	18	13	£8,987.21
0007764862	PCB POWER CONTROL	MTU	C16B-9914-0490/U	7	7	0	£2,591.33
0007769878	PCB POWER DISTRIBUTION BOARD	MARS DEFAU	504427-002	1	1	0	£14.33
0007820211	PCB POWER DRIVER	NORTEL	263040-001	4	3	1	£1,469.56
0007820838	PCB POWER DRIVER (420)	NORTEL	022615	1	0	1	£740.93
0007820035	PCB POWER FAIL SAFE A	NORTEL	021838	1	0	1	£653.34
0007752751	PCB POWER SEQUENCE	NTWKOSPAC	7752751	1	0	1	£190.40
0007729591	PCB POWER SUP+LOG DP26370	NTWKNPS	23065	7	4	3	£3,564.68
0007820217	PCB POWER SUPPLY	NORTEL	NTD2637051	1	0	1	£141.60
0007820229	PCB POWER SUPPLY	NORTEL	273835-001	1	0	1	£436.52
0007820837	PCB POWER SUPPLY (420)	NORTEL	022825	9	3	6	£3,737.61
0007820034	PCB POWER SUPPLY (420)	NORTEL	020847	6	4	2	£611.28
0007820013	PCB POWER SUPPLY COMP	NORTEL	7820013	1	0	1	£126.00
0007762244	PCB PPGA(APA1-CONTROLLER LOCATION AB/13)	LPS 40 NDX	01183052	1	1	0	£412.26
0007762245	PCB PPRAA(APA1-CONTROLLER LOCATION AB/18)	LPS 40 NDX	01209981	1	1	0	£775.51
0007729371	PCB PRAN	LPS	781202	2	0	2	£1,800.86

0007750147	PCB RB021 RELAY BOARD	LPTR LP200	220826A	1	0	1	0	1	0	£214.98
0007725499	PCB R8GB	LPS	517127	30	30	0	0	0	0	£6,260.40
0007732348	PCB RCAA	LPS 14/2	S26321-D308-X-9	2	1	1	0	1	0	£985.74
0007732347	PCB RCSAA	LPS 14/2	01128031	1	0	1	0	1	0	£1,178.38
0007725599	PCB RDA	LPS	380644	2	2	0	0	0	0	£554.64
0007725600	PCB RDAB	LPS	380652	2	2	0	0	0	0	£348.26
0007737567	PCB RDF512188U FMT READ CONTROL	MTU MTS780	C16B-5121-0880U	11	4	7	0	7	0	£7,557.99
0007726538	PCB READ 37.5 IPS	MTU 60KB	79021	18	4	14	0	14	0	£6,526.80
0007732944	PCB READ LOGIC	MTU MTS61M	108702	15	8	7	0	7	0	£3,245.40
0007722770	PCB READ PE 50 IPS	LPS	573531	2	0	2	0	2	0	£1,854.38
0007706012	PCB READ WRITE	MARS DEFAU	7706012	5	1	4	0	4	0	£475.55
0007725712	PCB RECEIVE INTERLOCK	LPS	531081	4	1	3	0	3	0	£483.52
0007820197	PCB RECIFIER	NORTEI	251985-001	8	7	1	0	1	0	£2,211.68
0007726312	PCB RECTIFIER CARD 036V	OFFPTR LX1	781900	4	1	3	0	3	0	£144.76
0007725533	PCB REGE	LPS	517224	4	2	2	0	2	0	£457.36
0007725563	PCB REGL	LPS	534609	1	1	0	0	0	0	£135.35
0007725544	PCB REGM	LPS	534579	1	1	0	0	0	0	£97.96
0007756141	PCB RELAY BRD 121 ASSY	LPTR	N203350A	1	0	1	0	1	0	£206.12
0007726255	PCB RES1	LPS	297984	1	1	0	0	0	0	£120.61
0007762040	PCB RGCAC(APA1-CONTROLLER LOCATION AB/14)	LPS 40 NDX	01216562	1	1	0	0	0	0	£746.00
4901154022	PCB RIBBON DRIVE	LPTR	44865003	21	8	13	0	13	0	£7,700.28
0007721258	PCB RISER PCBA CARD	MARS DEFAU	202616-001	7	7	0	0	0	0	£560.00
0007771145	PCB RISER PCI PCBA PREMIA MX	MARS DEFAU	PC40CBM	4	4	0	0	0	0	£2,552.00
0007724757	PCB RLEAA	LPS	S26311D-302-1	2	1	1	0	1	0	£139.44
0007762241	PCB RMCA(APA1-CONTROLLER LOCATION AB/10)	LPS 40 NDX	01133764	1	1	0	0	0	0	£703.06
0007757753	PCB ROM CARD	OFFPTR DL5	D05B-2971-D202	7	2	5	0	5	0	£446.60
0007725597	PCB ROMB	LPS	541729	2	2	0	0	0	0	£463.28
0007725598	PCB ROMC	LPS	541737	1	1	0	0	0	0	£426.65
0007725524	PCB ROMK	LPS	514756	3	3	0	0	0	0	£355.08
0007725525	PCB ROML	LPS	514764	3	3	0	0	0	0	£451.71
0007725567	PCB ROMM	LPS	517410	1	1	0	0	0	0	£177.89
0007725552	PCB ROMN V1	LPS	537837	1	1	0	0	0	0	£304.05
0007725553	PCB ROMN V2	LPS	537845	2	2	0	0	0	0	£623.58
0007725555	PCB ROMP	LPS	530821	2	2	0	0	0	0	£67.92
0007725556	PCB ROMQ	LPS	783353	1	1	0	0	0	0	£153.79
0007725551	PCB ROMR	LPS	514802	2	2	0	0	0	0	£331.58
0007732915	PCB RS232 I/F	OFFPTR R13	7732915	4	2	2	0	2	0	£1,093.60
0007750685	PCB RS232 I/F	OFFPTR ML1	4YA4021-1002G-001	28	0	28	0	28	0	£1,543.36
0007756353	PCB RS232 I/F IF243	OFFPTR DY4	714890W	14	5	9	0	9	0	£1,432.90
0007758652	PCB RS232 I/F ML320/321/390/391	OFFPTR ML3	18358001	1	0	1	0	1	0	£34.80
0080212342	PCB RS232 I/FACE FOR ECLIPSE SCALE	MARS DEFAU	59841001	5	5	0	0	0	0	£116.00
0007820182	PCB RS232 TDCON 188/48	NORTEI	188/48	21	7	14	0	14	0	£41,412.00
0007820349	PCB RS422 CONVERTOR	NORTEI	15792014	12	8	4	0	4	0	£876.96
0007732561	PCB RSCH-3 H/SPEED I/F FOR 80021007	OFFPTR ML8	LY-45161-3	71	30	41	0	41	0	£8,484.50
0007729487	PCB RSCL RS232 I/F	OFFPTR	4YA4050-1085G4	13	3	10	0	10	0	£1,908.53
0007750989	PCB RX/TX ADAPTOR BOX	LPTR	7750989	4	1	3	0	3	0	£1,670.40
0007772151	PCB S/BOARD 4/100T AST MS BRAVO	MARS DEFAU	202612-100	1	0	1	0	1	0	£650.00
0007734160	PCB SW FACIA ASSY	MTU	76257	2	1	1	0	1	0	£115.48
0005306176	PCB S91890	NETWK CREA	5306176	7	6	1	0	1	0	£4,315.36
0005306177	PCB S91990	NETWK CREA	5306177	4	1	3	0	3	0	£384.00
0005307259	PCB S92990	NETWK CREA	5307259	2	0	2	0	2	0	£1,441.76
0005307260	PCB S93090	NETWK CREA	5307260	31	4	27	0	27	0	£9,467.09
0007725519	PCB SAMA	LPS	474738	2	2	0	0	0	0	£343.62
0007725531	PCB SAME	LPS	517208	2	2	0	0	0	0	£294.96
0007725560	PCB SAMF	LPS	560112	2	2	0	0	0	0	£247.48
0007725570	PCB SAMG	LPS	530980	2	2	0	0	0	0	£247.84
0007725562	PCB SASG	LPS	831557	3	3	0	0	0	0	£279.09
0007725645	PCB SCAA	LPS	809039	2	2	0	0	0	0	£828.86
0007751532	PCB SCANNER MOTOR DRIVE	OFFPRINTER	53531661	22	16	6	0	6	0	£1,029.38

0007755173	PCB SCANNER MOTOR DRIVE	OFFPRINTER	G0005761	29	26	3	£585.22
0007725507	PCB SCDDL	LPS	355755	1	1	0	£101.10
0007759591	PCB SCPI/1	LPTR 4410	44B502440-G01	8	8	0	£89.60
0007721778	PCB SCSI BIPLANE MANHATTEN SERVER AST	MARS DEFAU	202460-002	1	0	1	£300.00
0080061241	PCB SCSI HOST ADAPTOR	MTS	80061241	3	1	2	£402.39
0007764971	PCB SCSI I/F SEDIFF USE ON DRS6000 TEAMSERVER	MTU	8009502	4	4	0	£4,060.00
0007725517	PCB SDAB	LPS	355933	1	1	0	£166.22
0007733626	PCB SEL SENSOR W/S ONLY	OFFPTR R16	7733626	3	3	0	£49.53
0007763590	PCB SENSOR INTERFACE	LPS PP250	B17B-0140-0850AU	2	1	1	£1,061.16
0007754628	PCB SEQAG S26311D437V1 -12	LPS ND3	1220969	5	1	4	£2,525.50
0007762041	PCB SERAJ/APA1-CONTROLLER LOCATION A(4)	LPS 40 NDX	01216562	1	1	0	£340.34
0007732179	PCB SERIAL I/F	OFFPTR QUM	91332-07	2	0	2	£1,005.72
0007726536	PCB SERVO	MTU 60KB	76241	9	0	9	£3,651.84
0007722767	PCB SERVO AMP 50 IPS	LPS	797308	1	1	0	£1,001.24
0007731201	PCB SERVO AMP POWER	LPTR PB144	44683662	3	0	3	£1,365.12
0007725606	PCB SGAC	LPS	823031	1	1	0	£282.73
0007725607	PCB SGAD	LPS	470066	4	4	0	£1,050.84
0007725504	PCB SHPC	LPS	355712	3	3	0	£458.22
0007756089	PCB SINGLE BRD MEMORY 4MB	NTWKSPAC	F-0068-0	5	1	4	£47,310.15
0007731195	PCB SKEWRELAY	LPTR PB144	7731195	1	0	1	£115.44
0007754948	PCB SLBP CONN BOARD	OFFPTR ML1	2PU4003-5723P1	30	27	3	£84.00
0007750680	PCB SLBS CONN BOARD	OFFPTR ML1	2PU4003-5624P1	39	21	18	£109.20
0007811549	PCB SLC	MARS DEFAU	39UJPB20001BMD	10	0	10	£1,796.40
0007725690	PCB SLKB	LPS	796816	1	0	1	£178.81
0007750686	PCB SLMC-1 CTRL LESS PROMS	OFFPTR ML1	7750686	74	5	69	£8,381.98
0007754950	PCB SLMP-2 CTRL LESS PROMS	OFFPTR ML1	7754950	22	0	22	£2,804.44
0007763691	PCB SLMR	OFFPTR ML1	4YA4021-1001G012	1	1	0	£99.85
0007751717	PCB SLPB-3	OFFPTR ML1	3YU5003-5611G3	20	12	8	£432.40
0007750678	PCB SLPB-4 PSU 240V	OFFPTR ML1	3YU5003-5611G4	307	292	15	£454.36
0007756045	PCB SMDP/6	LPTR 4410	44B502439-G06	2	0	2	£85.94
0007767580	PCB SMHI/5	LP1400	44C502565-G05	1	0	1	£286.94
0007766156	PCB SMMB/3	LPTR 4410	44C502592-G03	1	0	1	£138.69
0007756029	PCB SMP/2	LPTR 14/2	44C502591-G02	2	0	2	£231.30
0007732446	PCB SNA4	LPS	554413	1	1	0	£305.10
0007725644	PCB SNAH	LPS	722812	5	3	2	£1,512.05
0007722707	PCB SNAH	LPS	721654	1	1	0	£250.87
0007725619	PCB SNAI	LPS	401684	4	3	1	£434.16
0007725620	PCB SNAK	LPS	502855	2	2	0	£188.94
000CNX0045	PCB SOUND AWE-32 CREATIVE LAB	MARS DEFAU	CNX0045	1	1	0	£0.01
0007760754	PCB SP3	MT3	410846201	4	3	1	£1,554.60
0007725497	PCB SPAC	LPS	483141	8	8	0	£2,638.72
0007725520	PCB SPAD	LPS	539716	2	2	0	£233.00
0007756079	PCB SPSD/2	LPTR 4410	44B502454-G03S	1	1	0	£85.88
0007756050	PCB SPSX/3	LPTR 4410	44B502441-G03	2	0	2	£85.94
0007725463	PCB SRA	LPS	464880	1	1	0	£130.55
0007758555	PCB SRBS	OFFPTR ML3	4YA4021-1049G1	8	6	2	£158.48
0007725468	PCB SRG	LPS	328251	5	1	4	£2,884.75
0007762240	PCB SRLAA(APA1-CONTROLLER LOCATION AB:5-8)	LPS 40 NDX	01134310	1	1	0	£489.96
0007725604	PCB SSAP	LPS	464589	3	3	0	£656.34
0007729367	PCB SSAS	LPS	531405	2	2	0	£303.66
0007725627	PCB SSAT	LPS	528609	1	1	0	£225.57
0007725535	PCB SSJB	LPS	598755	2	2	0	£400.88
0007750155	PCB ST011 STKR RELAY DRIVE	LPTR LP200	2218AAA	7	0	7	£1,504.86
0007764111	PCB STACKER	LPS PP250	B17B-0140-0960AU	2	2	0	£848.94
0007732428	PCB STAD	LPS 14/2	S26241-D533-8	1	1	0	£134.00
0007732429	PCB STAE	LPS 14/2	S26241-D534-9	1	1	0	£139.81
0007732430	PCB STAF	LPS 14/2	S26241-D535-7	2	1	1	£263.34
0007732440	PCB STAG	LPS 14/2	S26241-D537-8	1	1	0	£255.14
0007732427	PCB STAR	LPS 14/2	S26241-D598-1	1	1	0	£165.67

0007824627	PCB STREAMER CONTROLLER	NORTEL	NT30670041	1	1	0	£237.12
0007813815	PCB STST 64K MEM RAM KRR	MARS DEFAU	56702 22541	9	9	0	£24,311.52
0007763545	PCB SUB-PANEL	LPS PP250	B17B-0140-0890AU	2	2	0	£404.24
0007713723	PCB SUBSCAN CENTRE	LPTR	7713723	4	3	1	£892.88
0007739463	PCB SVBAB	LPS 10	1129481	1	0	1	£1,941.91
0007739131	PCB SVBAC	LPS 10	1123783	3	0	3	£908.52
0007739132	PCB SVNAA	LPS 10	1116401	3	0	3	£484.38
0007764841	PCB SW SERVO WRITE	MTU	B17B-1540-0120A	5	4	1	£4,548.95
0007819092	PCB SWITCH CARD 16100	MODMIAL	16100/00	1	0	1	£174.01
0007726539	PCB SWITCH FACIA	MTU 60KB	7726539	2	1	1	£49.64
0007732947	PCB SWITCH FACIA	MTU MTS61M	108704	11	6	5	£1,350.47
0007820297	PCB SYC00181 ENCODER	NORTEL	241228-1	1	0	1	£481.82
0138319001	PCB SYSTEM BOARD LITE 25C	MARS DEFAU	138319-001	1	0	1	£820.00
0112571001	PCB SYSTEMBOARD DESKPRO 386/20E CPQ	MARS DEFAU	112571-001	1	0	1	£1,226.12
0035200032	PCB T032	MARS DEFAU	35200032	34	32	2	£4,080.00
0035200064	PCB T064	MARS DEFAU	35200064	150	143	7	£18,000.00
0035200198	PCB T198	MARS DEFAU	35200198	2	0	2	£240.00
0007725500	PCB TABB	LPS	355674	3	3	0	£333.75
0007725588	PCB TABE	LPS	380431	1	0	1	£196.78
0007725561	PCB TABK	LPS	510939	6	6	0	£559.88
0007754801	PCB TBMB CNTRL	OFFPTR ML2	7754801	30	0	30	£6,303.30
0007753321	PCB TBPN OPERATION PANEL	OFFPTR ML2	2YU5003-5669G1	1	0	1	£17.92
0007753322	PCB TBWB CONNECTION	OFFPTR ML2	2PU4003-5038P1	33	26	7	£531.96
0007757808	PCB TC24AA CONTROL	OFFPTR DL5	D16B-8608-0801	39	25	14	£7,030.14
0007732416	PCB TDBAA S26321D332V5GS8	LPS 14/2	1062190	8	8	0	£5,645.84
0007820138	PCB TDCON 188/56 RS232	NORTEL	188/56	1	0	1	£1,611.24
0007756535	PCB TDE/2 S22761L 222X -4	LPS 20	1129775	1	1	0	£185.08
0007725523	PCB TDLG	LPS	401471	17	17	0	£1,534.08
0007728370	PCB TDLL	LPS	739472	2	2	0	£680.84
0007758915	PCB TENSION ARM	MTU MTS780	9512101006	1	0	1	£47.88
0007820185	PCB TERMINAL DISPLAY CONTROLLER	NORTEL	NT30670025	1	1	0	£23.20
0007725471	PCB TGE	LPS	328367	3	3	0	£343.95
0007757752	PCB T124AA RS232/CENTRONICS I/F	OFFPTR DL5	D16B-9612-0501	44	40	4	£3,725.92
0007811547	PCB TIELINE AC15	MARS DEFAU	39UPB20001APA	6	0	6	£2,241.12
0007820213	PCB TIMING STATUS DP26308	NORTEL	263080-001	1	1	0	£260.61
0007737590	PCB TKBMU TAPE DRIVE MTU	MTU MTS780	B16B-7190-0020AU REV-K	30	2	28	£14,847.90
0007725532	PCB TKEE	LPS	534668	2	2	0	£451.24
0007813761	PCB TKI	MARS DEFAU	85UPB20010AAA	12	0	12	£2,074.08
0007762253	PCB TLA(AA/APA1-CONTROLLER LOCATION ABC/2)	LPS 40 NDX	01209990	1	1	0	£1,072.63
0007811550	PCB TLC LD	MARS DEFAU	39UPB20001BME	4	0	4	£649.60
0007725486	PCB TMXH	LPS	532975	1	1	0	£378.37
0007725490	PCB TMXX	LPS	504823	1	0	1	£280.74
0007762008	PCB TRACK(IN BASIC UNIT SUBMODULE 2)	LPS 40 NDX	01144219	3	0	3	£722.49
0007722725	PCB TRAD	LPS	842893	5	3	2	£3,337.90
0007757152	PCB TRANSFER HIGH VOLTAGE KX-P4450	OFFPTR P44	PJPM8Z	4	4	0	£85.84
0007759482	PCB TRANSFER HIGH VOLTAGE KX-P4450I	OFFPTR P44	PJPM12Z	2	2	0	£67.32
0007738925	PCB TRCAA	LPS 10	1189484	9	4	5	£13,547.52
0007824722	PCB TUBE BASE	NORTEL	SMH 054	2	2	0	£138.10
0007739133	PCB TUCAB	LPS 10	1107089	1	0	1	£600.08
0086022797	PCB TURBO IMAGE WITHOUT INTERFACE	IMAGE	51948/002	4	4	0	£3,201.60
0007737591	PCB TVAMU CAPSTAN POWER MTU	MTU MTS780	B16B-7200-0200AU	14	3	11	£5,963.86
0007737592	PCB TVBMU REEL POWER MTU	MTU MTS780	B16B-7210-0200AU	12	0	12	£6,254.16
0007737566	PCB TWIF512636U FMT TAPE UNIT I/F	MTU MTS780	C16B-5126-0360U	4	1	3	£1,961.52
0007756383	PCB TWIN AGGREGATE	NETWK OSMU	25UJU00722DJL	7	2	5	£4,660.88
0007725530	PCB TXAC	LPS	517194	2	2	0	£192.38
0007725569	PCB TYAB	LPS	522678	2	0	2	£224.04
0007732031	PCB UC 50 IPS CAPSTAN	MTU GTS	402672601	3	1	2	£529.05
0007730177	PCB UC 75 IPS	MTU	401934201	3	2	1	£1,308.90
0007730079	PCB UC 75+125 IPS DUAL SPD	MTU	402000206	61	6	55	£20,679.61

0007730028	PCB UHZAA	LPS	741256	1	1	0	£222.78
0080061249	PCB UTP LINE MODULE	NTWKOSLAN	1201-200-X02-1	4	1	3	£1,814.24
0080062351	PCB V24VRS232 I/F FOR REMOTE H/S BRIDGE	NTWK OSLAN	80062351	1	0	1	£366.56
0007759222	PCB V24V35 CAM DTE PCI 3000	NTWKOSPAC	3006-000	1	1	0	£189.24
0007767544	PCB VDU CONTROL FOR IBM 4683 9" MONITOR	IBM POS	IBM83X7601	1	0	1	£452.40
0007824648	PCB VDU NT CONN	NORTEL	SCX368	6	5	1	£175.38
0007820023	PCB VDU VTC 186	NORTEL	7820023	7	7	0	£153.72
0007725673	PCB VERA	LPS	537454	8	8	0	£368.80
0007725608	PCB VIAA	LPS	380776	1	1	0	£157.60
0007820026	PCB VID/CRT SMA008 & SMH009	NORTEL	SMA008 + SMH009	13	6	7	£1,806.48
0007820027	PCB VID/CRT SMA008 & SMH026	NORTEL	SMA008 + SMH026	75	20	55	£9,397.50
0007820028	PCB VID/CRT SMA032A & SMH031	NORTEL	SMA032A + SMH031	31	11	20	£3,884.30
0007758074	PCB VIDEO I/F	NIP PP240	7758074	3	2	1	£859.05
0007737593	PCB VQMMU POWER MTU	MTU MTS780	B16B-7220-0020AU	6	4	2	£1,893.60
0007725614	PCB WANB	LPS	559458	1	1	0	£396.97
0007725573	PCB WBAH	MEDIA	523615	4	4	0	£678.84
0007732435	PCB WDA A	LPS 14/2	499633	1	1	0	£189.50
0007732436	PCB WDAC	LPS 14/2	S26241-D595-1	1	1	0	£129.09
0007725574	PCB WFR A A	LPS	815020	1	0	1	£1,122.42
0007724010	PCB WRAC	LPS	7724010	2	2	0	£325.90
0007726537	PCB WRITE 37.5 IPS	MTU 60KB	78570	23	8	15	£7,236.72
0007735578	PCB WRMMU 125IPS READ/WRITE TRI	MTU MTS780	B16B-7230-0100AU	5	4	1	£6,760.75
0007737565	PCB WTF512186U FMT WRITE CONTROL	MTU MTS780	7737565	3	0	3	£1,674.69
0007725615	PCB WZDC	LPS	724084	1	1	0	£392.22
0007756382	PCB X21.6 CHANNEL	NETWK OSMU	7756382	15	2	13	£5,768.10
0007769994	PCB XT286 MOTHER BOARD (640K) IBM	MARS DEFAU	IBM2122	1	1	0	£200.00
0007725501	PCB YXAA	LPS	355682	14	14	0	£1,717.80
0007725502	PCB YXAB	LPS	355690	8	8	0	£1,545.04
0007765451	PCB ZGSAC	LPS 40 (ND)	1818317	8	2	6	£11,452.64
0007725494	PCB ZRAA	LPS	7725494	14	14	0	£2,807.00
0007725496	PCB ZRAB	LPS	517097	15	14	1	£2,279.70
0007756534	PCB ZS2/2 S22761L 202X -1	LPS 20	1157752	1	1	0	£49.90
0007725518	PCB ZTAA	LPS	355941	2	2	0	£341.12

Disp3

0007920496	3990 PCB MCDL	PCNDNOKIAC	6962045102	1	0	1	£106.47
0007737057	PANEL PCB AD 90AA	POS9516	D16L-9349-0038	13	11	2	£924.43
0007737055	PANEL PCB ND 90AA	POS9516	D16B-9424-0501	1	0	1	£102.47
0007920405	PCB	PCNDNOKIAC	15127420-30	2	0	2	£286.20
4900709802	PCB	POS	4900709802	2	2	0	£159.68
0007769186	PCB	PP2125	B17B-1410-0210AU	1	1	0	£89.17
0007769184	PCB	PP2125	B17B-1410-0190AU	1	1	0	£146.87
0007769257	PCB	PP2125	B17B-1410-0170AU	1	1	0	£537.45
0007769258	PCB	PP2125	B17B-1410-0180AU	1	1	0	£1,122.88
0007920479	PCB-A	PCNDNOKIAC	7920479	5	4	1	£130.90
0007920157	PCB (PRD 2)	PCNDNOKIAC	15132420-20RD	84	2	82	£23,929.24
0007769254	PCB 7777	PP2125	B17B-1410-0250AU	2	2	0	£435.12
0007769099	PCB 7777	PP2125	B17B-1410-0240AU	1	1	0	£51.54
490123102	PCB 0850 POWER SUPPLY	POS TERMIN	4901723102	59	3	56	£8,025.18
0007734951	PCB 16K CPU	PERQ 2	111332-00	12	1	11	£24,793.56
0080019910	PCB 16K CPU	PERQ 2	110196-00	3	1	2	£4,241.64
0007734949	PCB 1MB	PERQ 2	110241-00	3	0	3	£4,306.59
0007765265	PCB 2 SLOT ID1	PSCLCLASSI	55 89302 001	30	27	3	£184.20
0088830587	PCB 2 SLOT M30/286	PCTPM30-00	88830587	122	111	11	£707.60
0007830061	PCB 23662/001 MAIN ASSEMBLY	POS SCANNE	0428-0473-1	5	2	3	£1,687.80
0007734947	PCB 2MB	PERQ 2	7734947	5	0	5	£20,890.10
0080061117	PCB 2MB STORE MODULE	PCTM2MBMEM	55 13007 001	28	11	17	£4,567.08
0007920929	PCB 3COM 16 BIT ETHERNET	PCNDNOKIAC	3C507	2	0	2	£500.00
0007759586	PCB 4 SLOT - PCT	PCTPM50-00	55 11904 201	132	130	2	£2,022.24

0007758359	PCB 4 SLOT FOR M45 PC TERMINAL	PCTPM4540M	7758359	21	10	11	£180 18
0088830585	PCB 4 SLOT M35/286	PC M35-04	88830585	26	24	2	£258 70
0007760002	PCB 4 SLOT M75	PCTPM75BAS	7760002	1	0	1	£15 31
0088830568	PCB 4 SLOT PCT	PCTPM75BAS	88830568	100	93	7	£1,106 00
0007920581	PCB 4565 DRIVE	PCNDNOKIAC	55366004-01	2	1	1	£19 84
0080061116	PCB 512KB STORE FOR 8086	PCTMST2KME	55 13007 011	8	4	4	£648 80
0007958537	PCB 7404 DUAL HOST EXT I/F V24/V28/V35 & CABLE	PCNDNOKIAC	470-000120-000	2	2	0	£2,182 00
0007920497	PCB 9185-001 DCA	PCNDNOKIAC	7920497	16	8	8	£3,968 96
0007920567	PCB 9191-001 DME	PCNDNOKIAC	7920567	8	8	0	£50 96
0007920475	PCB 9192-001 CME	PCNDNOKIAC	7920475	35	30	5	£776 65
4901694005	PCB 9510 01 PROC (-ROMS)	POS TERMIN	4901694005	1	1	0	£145 64
4901694004	PCB 9512 01 PROC (-ROMS)	POS TERMIN	4901694004	94	0	94	£14,914 98
0007729863	PCB A PROCESSOR	POS TERMIN	APEE1450BA	1	0	1	£167 22
0088830510	PCB A510 386 MOTHERBOARD	PWSFBASEUN	88830510	6	0	6	£186 18
0088830520	PCB A520 MOTHERBOARD	PWS BASEUN	88830520	116	22	94	£35,971 60
0088830521	PCB A521 1MB MEMORY	PWS BASEUN	88830521	20	10	10	£3,340 20
0088830522	PCB A522 4MB MEMORY	PWSM 4MBME	88830522	16	12	4	£7,081 04
0088830555	PCB A555 MODULE OSLAN 100/200	PCT16BTPCB	88830555	36	0	36	£2,034 72
0088830558	PCB A558 OSLAN 500 INTERFACE MODULE	PCT 16BTPC	88830558	54	9	45	£3,132 00
0088830604	PCB A604 POWER DISTRIBUTION BOARD	PCP TYRANT	88830604	4	4	0	£326 48
0005154129	PCB AC DIST	PERQ 1	515-4129	2	2	0	£26 20
0007920573	PCB ACA	PCNDNOKIAC	7920573	17	16	1	£171 02
0007920664	PCB ACA-A	PCNDNOKIAC	7920664	49	45	4	£135 73
0007920226	PCB ACA-B PCB (4199-001)	PCNDNOKIAC	7920226	106	102	4	£611 62
0007920490	PCB ACA-D	PCNDNOKIAC	E341930110	9	9	0	£15 93
0007920556	PCB ADA	PCNDNOKIAC	7920556	53	51	2	£1,693 35
0080212980	PCB ADAPTOR 1542CF SCSI I/F	PCTPM95-00	80212980	15	0	15	£1,429 65
0007767539	PCB ADAPTOR CARD AT1 VLB Mach 32	PS ADAPTOR	PD013035	6	6	0	£1,187 04
0007767538	PCB ADAPTOR CARD GAZI	PS ADAPTOR	PD013033	71	55	16	£10,752 24
0007940161	PCB ADAPTOR I/F WAN V 35	PCSCSPRING	AC40018 1	3	3	0	£42 39
0007737058	PCB A190AC	POS9516	D16B-8425-0202	20	7	13	£2,642 60
0007949352	PCB APPLIQUE V 3 FOR A-CHASSIS	PCNDNOKIAC		1	1	0	£120 64
0007720451	PCB ASSY 2 VERT FORMAT	PRINTER	7720451	1	0	1	£34 53
0007770942	PCB AT SERIAL/PARALLEL	PS BQ1	IBM8286147	9	9	0	£522 00
0007920500	PCB ATTACHMATE SDC BOARD	PCNDNOKIAC	AC-09999 62	5	0	5	£560 15
0007920674	PCB B3100 MASTER LOGIC BOARD	PCNDNOKIAC	KDY1981001	10	0	10	£2,300 70
0005154461	PCB B82 VER 2 IOB G PERQ	PERQ 1	5154461	3	1	2	£1,070 79
4901654402	PCB BACKBOARD	POS TERMIN	4901654402	10	0	10	£1,094 80
0005155480	PCB BB11 ADAPTOR	PERQ 2	5155480	4	0	4	£600 16
0005156002	PCB BB50 I/O SYNC	PC2	5156002	8	3	5	£618 40
0005156431	PCB BB56 16BIT	PC2 16BITE	5156431	19	9	10	£2,624 47
0005403286	PCB BE 97 VER 1 UTILITY FOR FXD DISC	PWS BASEUN	5403286	74	10	64	£13,835 78
0005402660	PCB BE21 1 MB MEMORY	PWS BASEUN	5402660	15	9	6	£1,561 95
0005402862	PCB BE22 4MB MEMORY	PWS BASEUN	5402862	2	0	2	£894 90
0005402865	PCB BE60 VERSION 2	PWS BASEUN	5402865	11	7	4	£3,370 07
0005403735	PCB BE61 MMU VERSION 4	PWS BASEUN	5403735	1	1	0	£40 96
0005405450	PCB BE61 MMU VERSION 5	PWS BASEUN	540540	134	132	2	£5,081 28
0005402683	PCB BE65 HDLC/RS232 COMMS	PWSCOMMS23	5402683	64	56	8	£9,181 44
0005402558	PCB BE69 CONTROL PANEL	PWS BASEUN	5402558	8	6	2	£61 36
0005402879	PCB BE87 RS232 SYNCHRONOUS COMMS	PWSSUNCOMM	5402879	16	9	7	£1,380 32
0005403110	PCB BE88 VIDEO	PWS BASEUN	5403110	25	12	13	£3,463 75
0005403297	PCB BE98 UTILITY VERSION 1	PWS BASEUN	5403297	5	4	1	£484 05
0007737107	PCB BM915A BUBBLE SUB	POS9516	7737107	211	47	164	£57,558 69
0007737106	PCB BM91AB BUBBLE MAIN	POS9516	7737106	98	55	43	£13,246 66
0007756398	PCB BRD ROM	POS SCANNE	D11B-7002-D201F	2	0	2	£539 36
0007765943	PCB BUS ASSY	PS DKGMODL	42DOKBAIC15	4	3	1	£67 56
0007764501	PCB C-COUPLER	POS SPECIA	MB/C	3	1	2	£1,566 00
0007729864	PCB C PRINTER/DRAWER	POS TERMIN	APEEA072CA	14	0	14	£2,702 70
0007920211	PCB CCC-1	PCNDNOKIAC	7920211	43	28	15	£1,403 52

0007920212	PCB CCC-2	PCNDNOKIAC	7920212	4	2	2	2	£130.56
0007920289	PCB CNE-A 1MB	PCNDNOKIAC	7920289	12	7	5	5	£2,455.32
0007936505	PCB CNTRU/MUX	PCNDNOKIAC	7936505	1	0	1	1	£106.21
0007920315	PCB CONTROL	PCNDNOKIAC	7920315	4	2	2	2	£4,050.72
0007920208	PCB CPB	PCNDNOKIAC	N2696-63-02N	5	3	2	2	£93.45
0007920559	PCB CPB	PCNDNOKIAC	7920559	6	4	2	2	£205.80
0007765235	PCB CPU	PCNDNOKIAC	W13104-ZZ0	3	2	1	1	£1,595.04
0007950816	PCB CPU 16MHZ	PCNDNOKIAC	AC41208 1	26	21	5	5	£5,320.12
0080062649	PCB CPU 33MHZ WITH INTEGRATED CACHE	PCTPM9533M	91 51110 024	17	14	3	3	£10,846.17
0007920788	PCB CPU 3405 JCPU/1	PCNDNOKIAC	44C510003-G01	7	0	7	7	£2,576.84
0007764285	PCB CPU 386SX/20MHZ(CX386S)	PCSCSPRING	AC41208	38	0	38	38	£4,570.26
0007767913	PCB CPU 486/33MHZ LESS CPU SD433D	PS SD48625	51-60153-34	14	7	7	7	£1,612.94
0007767125	PCB CPU 486DX33/66 WITH P24T FACILITY SKT	PCSCSPRING	AC41356/9	37	0	37	37	£6,867.20
0007766354	PCB CPU 486SX-33MHZ (D433XG)VDU,SCSI,LAN,AIO	PS BASEUNI	AC41346	25	21	4	4	£9,243.50
0005154122	PCB CPU 4K	PERQ 1	5154122	2	1	1	1	£1,776.88
0007764322	PCB CPU I486DX/33MHZ	PCSCSPRING	7764322	3	0	3	3	£985.23
0007764321	PCB CPU I486SX/20MHZ	PCSCSPRING	AC41238	37	27	10	10	£3,540.16
0007766743	PCB CPU PENTIUM	PCSCSPRING	AF33061	4	1	3	3	£5,801.24
0007920220	PCB CRB	PCNDNOKIAC	E3411100.10	90	0	90	90	£2,792.70
0007920313	PCB CRB/2	PCNDNOKIAC	7920313	19	0	19	19	£3,152.86
0007755774	PCB CRT (LESS TUBE+YOKE)	PCDUM7381L	7755774	1	0	1	1	£82.30
0007933214	PCB CSVX MOTHER	PCNDNOKIAC		5	5	0	0	£3,105.00
0007920095	PCB CU2	PCNDNOKIAC	7920095	27	20	7	7	£2,984.30
0080061743	PCB DAUGHTER BOARD FOR M30	PCTPDISCLE	55 13010 201	89	88	1	1	£485.94
0007959915	PCB DEFLECTION	PCNDNOKIAC	SMB032	64	0	64	64	£3,760.00
0080062443	PCB DIN JACK	PCSCSPRING	55 11203 201	10	0	10	10	£26.10
0007750980	PCB DISC ADAPTOR	PERQ 2	111269-00	5	0	5	5	£2,173.20
4901555404	PCB DISPLAY 16 DIGIT	POS TERMIN	4901555404	2	0	2	2	£428.74
0007752348	PCB DISPLAY ASSY	POS 9500	91000002	104	64	40	40	£12,399.92
0088830566	PCB DISTRIBUTION	PCTPM95-00	88830566	42	40	2	2	£1,366.26
0007950882	PCB DPG ASCII	PCNDNOKIAC	7950882	349	147	202	202	£51,002.86
0007764845	PCB DPG BOARD FOR ALUC10	PCNDNOKIAC	7764845	25	5	20	20	£1,658.25
0007951063	PCB DS348 MEMORY 8MB	PCNDNOKIAC	7951063	32	28	4	4	£21,207.04
0007947373	PCB DSC/3	PCNDNOKIAC	7947373	24	22	2	2	£3,320.64
0007950826	PCB DT226 286/16 MHZ	PCNDNOKIAC	AC41227	9	5	4	4	£1,727.64
0007920210	PCB DTC-B	PCNDNOKIAC	2ROA1195302	85	54	31	31	£13,637.40
0007920396	PCB DTC-C	PCNDNOKIAC	7920396	12	10	2	2	£852.36
0007920398	PCB DTC-D	PCNDNOKIAC	7920398	14	13	1	1	£289.60
0007770948	PCB DUAL DRIVE IBM	PS BQ1	IBM8286125	2	2	0	0	£116.00
0007933212	PCB DVCX CONTROL	PCNDNOKIAC	47126057	10	3	7	7	£9,966.40
0007729866	PCB E MOTHERBOARD	POS TERMIN	21000-0102	30	27	3	3	£4,010.40
0005155496	PCB EIO	PERQ 2	PCB E10	12	5	7	7	£18,191.88
0080061889	PCB EISA/SCSI HOST ADAPTOR AHA1740A	PCP M95-20	80061889	2	2	0	0	£524.88
0080051463	PCB ENGA VIDEO	PWS EMGAPC	80051463	550	534	16	16	£137,951.00
0007763813	PCB EPHIC	POS ATM	D16B-9629-O401	1	1	0	0	£28.90
0007920154	PCB ETHERNETLINK II 3CON 3C503 E21	PCNDNOKIAC	AF33201	48	17	31	31	£6,542.40
0007769780	PCB ETHERTEAM 16i DUO	PS ETHTEAM	PN010116	29	0	29	29	£1,110.12
0007755773	PCB F1021 LOGIC	PCDUM7381L	7755773	3	0	3	3	£174.00
0007730304	PCB F3098	PCDUM2000C	C2LD6306	7	3	4	4	£902.02
0007731826	PCB F325B LOGIC	PCDUM2000C	7731826	13	2	11	11	£2,277.08
0007739264	PCB F467 LOGIC	PCDUMKOKMK	30001	16	12	4	4	£2,627.20
0007750578	PCB F547 LOGIC	PCDUMKOKLS	PCB F547 LOGIC	22	5	17	17	£4,830.98
0007750175	PCB F560	PDCUCOK73	7750175	103	1	102	102	£57,408.08
0007754397	PCB F654 LOGIC	PCDUMKOKLC	7754397	28	16	12	12	£6,317.64
0007920297	PCB FACIT 4513 MASTER LOGIC	PCNDNOKIAC	55368936005	3	3	0	0	£900.00
0007920298	PCB FACIT 4514 MASTER LOGIC	PCNDNOKIAC	55368930008	4	2	2	2	£732.76
0007920471	PCB FDA	PCNDNOKIAC	7920471	17	15	2	2	£46.58
0007920397	PCB FDA	PCNDNOKIAC	7920397	24	12	12	12	£513.60
0007920474	PCB FDP	PCNDNOKIAC	7920474	77	49	28	28	£508.97

0007764768	PCB FF C03 V 24 AT CARD	PCNWFIREFO	NSNCC3A	1	0	1	£159 50
0007764766	PCB FF X 25 V24 DTSX13 MCA CARD	PCNWFIREFO	NSNCX2M	1	0	1	£631 62
0080035912	PCB FIXED DISC CONT	PC1 MOD 30	80035912	2	2	0	£677 50
0007750228	PCB FIXED DISC CONTROLLER	POS OST	7750228	5	2	3	£1,873 40
0007763928	PCB FL50AA MOP	POS ATM	D16B-9684-Q301	1	0	1	£36 11
0007763933	PCB FL90BA AMBIENT LIGHT	POS ATM	D16B-9708-O601	14	14	0	£829 36
0007929458	PCB FLEXIBLE	PCNDNOKIAC	55368262-00	8	8	0	£57 28
0088800830	PCB G830 PROCESSOR	PC1 MOD 10	88800830	2	1	1	£72 60
0088800831	PCB G831 FLEXIDISC CNTLR	PC1 MOD 10	88800831	26	24	2	£4,815 46
0088800858	PCB G858	PC1 MOD 10	88800858	11	8	3	£964 37
0088800884	PCB G884 MPU	PC2 MODEL1	88800884	16	13	3	£881 92
0088800885	PCB G885 SAS1	PC2 MODEL2	88800885	62	17	45	£3,636 30
0088800895	PCB G895	PERQ 2	88800895	3	2	1	£3,042 36
0088800896	PCB G896 64KB RAM	PC2 MODEL2	88800896	9	8	1	£640 26
0005312582	PCB G982	PCQ 348KBS	5312582	6	4	2	£1,035 90
0007764303	PCB GAMMAFAX	PCSCSPRING	AF33189	1	0	1	£587 15
0007950884	PCB GRAPHICS	PCNDNOKIAC	7950884	21	20	1	£3,444 00
0007920564	PCB HARD DISK CONTROLLER	PCNDNOKIAC	ROF1976252/1	31	19	12	£10,769 09
0007769536	PCB HOPPER CONTROLLER	PP2125	B17B-1410-0200AVU	2	2	0	£518 36
0007759684	PCB HOST ADAPTOR	PCT180TPEE	4251	2	0	2	£167 20
0005155092	PCB I/O ETH/CANNON	PERQ 1	100266-00	2	0	2	£577 32
0007751811	PCB I/F READER FOR V40 PROCESSOR	POS 9500	F02376/11	37	6	31	£8,584 00
0080035926	PCB I/O 2 PT PER CONT	PC1 MOD 10	80035926	1	1	0	£22 43
0080035927	PCB I/O PERIPH/CONT	PC MOD 31	80035927	2	2	0	£225 04
0007920214	PCB ICBO	PCNDNOKIAC	7920214	21	20	1	£1,010 94
0007766745	PCB IFA	PCSCSPRING	AC41354	4	3	1	£147 04
0088808177	PCB K177	PC2 MODEL1	88808177	12	10	2	£1,114 44
0088808235	PCB K235	PC2 MODEL	88808235	45	11	34	£4,002 30
0088808236	PCB K236	PC2 MODEL	88808236	68	25	43	£7,861 48
0088808237	PCB K237	PC2 MODEL	88808237	31	4	27	£3,689 93
0088808261	PCB K261 512KB STORE	PCQ 0 5 ME	88808261	49	10	39	£7,868 42
0088808341	PCB K341 1MB MEMORY	PCQ MOD249	88808341	25	10	15	£4,642 25
0088808342	PCB K342 CPU PC2	PCQ MOD249	88808342	44	0	44	£10,964 80
0088808355	PCB K355 I/O	PCQ MOD249	88808355	32	6	26	£3,347 84
0088808373	PCB K373 SCSI I/F	PCQ MOD249	88808373	39	1	38	£3,605 55
0088808437	PCB K437 DUAL I/O	PC QUATTRO	88808437	9	5	4	£1,506 06
0088808439	PCB K439 4MB STORE	PCQ 4MBMEM	88808439	8	2	6	£4,278 48
0088808644	PCB K644	POS FISCAL	88808644	3	0	3	£261 00
0007720328	PCB KIT ASSY (DRICO)	PRINTER	7720328	15	0	15	£6,294 15
0088830548	PCB LCD DRIVER A548	PCTPM95-00	88830548	21	17	4	£1,097 67
0088830589	PCB LCD/BIOS MX486	PCP M95-20	88830589	12	2	10	£2,935 92
0007757368	PCB LED	PCTPDISCLE	55 13002 211	47	38	9	£157 92
0088830569	PCB LED	PCTPM75BAS	88830569	75	74	1	£239 25
0007765944	PCB LED ASSY	PS DKGMODL	43DOKLAIC16	78	78	0	£96 72
0007765266	PCB LED ID1 (HOA)	PSCLCLASSI	55 99303 011	11	9	2	£39 60
0007920468	PCB LEPV-1 (WITHOUT PROMS)	PCNDNOKIAC	71503854	21	16	5	£447 93
0007737105	PCB LN92AA (WHOLE UNIT-F2386/01)	POS9516	7737105	39	34	5	£4,931 16
0007734315	PCB LOGIC	PCDUCOLKOK	20005	21	4	17	£4,740 96
0007752347	PCB LOGIC ASSY	POS 9500	92000003	14	5	9	£2,073 82
0007770760	PCB LOOP ADAPTOR CARD (4680)	PS SOMER	83X7575	6	4	2	£2,784 00
0007759215	PCB M40/45 ADAPTER FOR ARCHIVE VIPER 150e CMT	PCTT150TPE	21131-001	8	6	2	£189 20
0007737205	PCB MAIN	POS SCANNE	7737205	28	16	12	£15,971 20
0007765277	PCB MAIN 100/286 12MHZ 1MB	PSCLCLASSI	55 99201 001	17	9	8	£2,980 27
0007765259	PCB MAIN 1M ID1-1101 16MHZ	PSCLCLASSI	55 99301 021	11	5	6	£3,090 78
0007765337	PCB MAIN 386SX/25MHZ	PSPCLASSIC	55 33201 061	25	16	9	£7,096 75
0007732929	PCB MAIN ASSY	POS OST	7732929	41	3	38	£22,887 02
0007737190	PCB MAIN MP92AA	POS TERMIN	7737190	41	21	20	£47,847 00
0007757378	PCB MAIN WITH 640K STORE	PCTPDISCLE	55 13006 003	51	3	48	£11,489 78
0007920586	PCB MASTER EU (B3150)	PCNDNOKIAC	KDY1981002	48	13	35	£11,518 08

PCB

0007920587	PCB MASTER EU (B3350)	PCNDNOKIAC	KDY1981003	21	17	4	£5,408.13
0007752239	PCB MD90BA EXTERNAL MODEM	POS	D16B-9439-0001 REV D	21	13	8	£4,333.98
0007737104	PCB MD90BA REV C (WHOLE UNIT-F2386/03)	POS9516	D16B-9439-0001	14	9	5	£2,241.12
0007754806	PCB MDIIOC + RS232 SUB	POS 9516	7754806	52	40	12	£9,837.88
0005154434	PCB MEMORY 1MB	PERQ 1	PCB MEMORY 1MB	8	3	5	£3,382.72
0080062018	PCB MEMORY MX486	PCP M95-20	80062018	14	7	7	£2,271.92
0007765236	PCB MO/MO	PCNDNOKIAC	W13101-ZZ6	1	1	0	£593.86
0007949283	PCB MONITOR BOARD FOR TD051121	PCNDNOKIAC	7949283	67	25	41	£30,384.50
0007770941	PCB MONO DISPLAY ADAPTOR	P S BQ1	IBM8529148	6	6	0	£139.20
0007761729	PCB MOTHERBOARD 1116SX M50/M55/16	PCTPM50-00	55 11201 241	168	0	168	£36,471.12
0086023604	PCB MOTHERBOARD 486DX/33MHZ	PS 486SDX3	86023604	15	11	4	£3,444.45
0088830576	PCB MOTHERBOARD A576	PCP M35-04	88830576	195	0	195	£87,477.00
0088830610	PCB MOTHERBOARD A610	PCP TYRANT	88830610	8	7	1	£4,456.88
0007760364	PCB MOTHERBOARD M75 EARLY VERSION	PCTPM75BAS	81 48701 S01	4	0	4	£7,180.24
0007763307	PCB MOTHERBOARD QC339 386SX 20MHZ	PCNB NOTEB	31339MB0002	22	0	22	£7,731.68
0007731811	PCB MOTOR	POS TERMIN	C901054000	39	17	22	£880.23
0007751466	PCB MOTOR DRIVER	POS SCANNE	D16L-9349-0065	14	9	5	£1,950.20
0007737182	PCB MP80CA 128K	POS9516	7737182	51	17	34	£28,945.67
0007752036	PCB MP92CA MAIN	POS 9518	7752036	49	0	49	£57,183.00
0007920411	PCB MRW-A	PCNDNOKIAC	E341910010	44	42	2	£1,436.16
0007920472	PCB MRW-B	PCNDNOKIAC	7920472	6	4	2	£54.96
0007920487	PCB MRW C	PCNDNOKIAC	E341910021	9	3	6	£417.60
0007920344	PCB NCTB (3980)	PCNDNOKIAC	5962026103	39	12	27	£4,325.10
0007768937	PCB NEWPORT SYSTEMS XCI ENHANCED - X25	PS UK SPEC	CI-XCI-10065	3	2	1	£2,784.00
0007920579	PCB NLB 4440 30M	PCNDNOKIAC	11424610-30	3	0	3	£56.55
0007768749	PCB ONYX (V28 VSN)	PS SPECIAL	ONYXP	2	0	2	£1,136.80
0007737224	PCB OPT	POS SCANNE	7737224	6	0	6	£1,460.58
0007752791	PCB OSLAN I/F PC	PCQQTROSI/	7752791	7	4	3	£2,827.37
0080061215	PCB OSLAN V7 100/200 CNTRL	PWS OSLAN	80061215	69	9	60	£10,405.20
0007761848	PCB PANEL ASSY ICL-OP-A1	PCT UPSM15	P36A0021	9	9	0	£28.35
0007920316	PCB PARALLEL I/O	PCNDNOKIAC	608290-2	7	6	1	£1,610.00
0007769774	PCB PARALLEL MICROCONTROLLER UNBUFFERED	PS UK SPEC	P1881	7	0	7	£883.27
0007756186	PCB PC2 ADAPTER	PC STM6/B	965010	6	6	0	£183.24
0007756772	PCB PC2 ADAPTER FOR ARCHIVE 2150L CMT PWS	PWSITPECAR	21131-102	4	0	4	£205.48
0007737081	PCB PD91AA PTR DRIVER	POS9516	D16B-9473-0901	17	10	7	£4,894.30
0088830608	PCB POWER DISTRIBUTION MX486	PCSCSPRING	88830608	25	22	3	£2,478.75
0007820614	PCB POWER RECT CIRC	PCNDNOKIAC	7920614	6	4	2	£251.94
0007754845	PCB POWER SUPPLY COMPLETE WITH HEATSINK	POS TERMIN	5AAPEE1550BA	43	7	36	£8,886.81
0007920868	PCB POWER/VIDEO PRE-AMP	PCNDNOKIAC	SMA106	1	0	1	£54.24
0007736911	PCB PPD3BA	POS TERMIN	D16B-9508-0402	52	0	52	£4,918.68
4901664902	PCB PRINT HEAD	POS TERMIN	005-9016649-02	9	2	7	£522.54
4901681003	PCB PRINTER	POS TERMIN	9016810-03	32	6	26	£6,645.44
4901894904	PCB PROCESSOR 127 TOTALS	POS TERML	4901894904	26	12	14	£5,915.78
0007734324	PCB PROCESSOR A05	POS TERMIN	7734324	1	0	1	£192.66
0007920086	PCB PROCESSOR MP2	PCNDNOKIAC	7920086	9	1	8	£35,112.78
0007755775	PCB PSU	PCDUM7381L	7755775	1	0	1	£25.69
0007959903	PCB PSU	PCNDNOKIAC	SMA083	23	23	0	£1,351.25
0007752733	PCB PSU	POS SCANNE	454850-0450	2	2	0	£89.44
0007729872	PCB PSU	POS TERMIN	7729872	2	0	2	£110.76
0007958381	PCB PSU/CRT	PCNDNOKIAC	ROA1195327	7	0	7	£283.99
0080061297	PCB QUATTRO XM OSLAN	PCQ QXMLAN	80061297	8	4	4	£3,248.00
0007936496	PCB READ/WRITE PRE-AMP	PCNDNOKIAC	4901661301	3	2	0	£218.00
4901661301	PCB READER	POS TERML	4901661301	3	1	2	£163.50
0080060744	PCB REGULATOR CARD ASSY	POS MOST 3	20P00024	1	0	1	£6.96
0007758991	PCB ROM BOARD 60HZ	POS SCANNE	D11B-7002-D101	4	4	0	£789.96
0007763721	PCB ROM IBM	POS SCANNE	D11B-7002-D148	1	1	0	£275.17
0007764771	PCB ROM SWAN MK2	POS SCANNE	D11B-7002-D221	24	24	0	£5,778.72
4901841910	PCB RP8 MEMORY 64K	POS	4901841910	1	0	1	£158.65
0080060009	PCB S1410A WINCHESTER DISC CTRLR	PC2 MODEL	80060009	44	5	39	£9,991.08

0005156192	PCB SASI BUS SW BB55	PC HDA10M	5156192		2	0	2	£235.44
0007733647	PCB SATELLITE	POS OST	7733649		8	5	3	£478.16
0007920602	PCB SCA	PCNDNOKIAC	E341940000		9	5	4	£80.54
0007920473	PCB SCA-B	PCNDNOKIAC	7920473		19	17	2	£58.33
0007920597	PCB SCA-D	PCNDNOKIAC	7920597		11	9	2	£65.67
0007770775	PCB SCSI DISK ADAPTOR CARD	PS SOMER	IBM85F0002		3	3	0	£365.40
0007751801	PCB SCSI FORMATTER & FIRMWARE	PC STMR TP	7751801		78	1	77	£30,139.20
0007920610	PCB SERIAL I/O RS232C	PCNDNOKIAC	608860-4		2	0	2	£503.40
0007732739	PCB SERVO	PC1 MOD.10	7732739		4	4	0	£59.52
0007936499	PCB SERVO FINE	PCNDNOKIAC			1	1	0	£109.00
0007757370	PCB SLOT	PC1PDISCLE	55 13008 001		118	117	1	£625.40
0007758354	PCB SLOT FOR M40	PC1PM40BAS	7758354		37	29	8	£202.02
0007765094	PCB SMART CARD TOKEN RING 16/4 EISA	PCSCSPRING	PN011010		7	6	1	£3,524.15
0007771642	PCB SOUNDBLASTER 16 BIT SCSI2	PCSCSPRING	CJ194		3	3	0	£382.80
0007761843	PCB ST68-CM-A0/230V	PCT UPSM15	7761843		1	0	1	£39.32
0007761844	PCB ST68-PC-A0	PCT UPSM15	P32A0016		6	5	1	£213.24
0007730463	PCB STEPPER	PERQ 1	7730463		3	3	0	£307.38
4902061801	PCB STORE EXPANSION	POS B900	4902061801		1	0	1	£127.82
0007765945	PCB SWITCH ASSY	PS DKGMODL	44DOKSAIC14		13	13	0	£219.57
0007920284	PCB SYSTEM	PCNDNOKIAC	ROA1196570/1		52	32	20	£39,645.32
0007920118	PCB SYSTEM BAT	PCNDNOKIAC	7920118		125	67	58	£61,202.50
0007767347	PCB SYSTEM BOARD 80486SL-25MHZ (MONO)	PS NBK 486	31SK5NB0001		87	30	57	£31,360.02
0007920447	PCB SYSTEM BOARD E17	PCNDNOKIAC	7920447		5	3	2	£1,500.00
0007766141	PCB SYSTEM BOARD SL385s/25 TechnICL	PS BASEUNI	PL060520		4	0	4	£405.80
0007766143	PCB SYSTEM BOARD SL486/33 TechnICL	PS BASEUNI	PL060522		39	0	39	£12,511.59
0007766142	PCB SYSTEM BOARD SL486s/25 TechnICL	PS BASEUNI	PL060521/AF33058		22	21	1	£4,456.76
0007920213	PCB TAB	PCNDNOKIAC	7920213		73	54	19	£1,562.20
0007920568	PCB TAPE STREAMER CONTROL	PCNDNOKIAC	2195549/1		4	4	0	£95.88
0007920229	PCB TCC	PCNDNOKIAC	E349320000		103	24	79	£53,263.36
0080061206	PCB TCP/IP LAN	PWS TCP/IP	80061206		26	0	26	£2,201.94
0007920492	PCB TIA	PCNDNOKIAC	E340630000		24	23	1	£2,227.68
0007920491	PCB TIA A	PCNDNOKIAC	7920491		96	92	4	£879.36
0007920225	PCB TUA	PCNDNOKIAC	7920225		59	50	9	£2,060.28
0007920264	PCB TUA	PCNDNOKIAC	7920264		6	3	3	£178.02
0007920605	PCB TUA-2 CONN	PCNDNOKIAC	E341800001		60	50	10	£355.80
0007920598	PCB TUA-T 8 CONN	PCNDNOKIAC	7920598		12	8	4	£38.64
0007920504	PCB TUM EXP	PCNDNOKIAC	ROF1876207		3	2	1	£15.51
008808325	PCB TYPE K325 PLUGIN	POS 9518	88808325		2	1	1	£22.42
008808326	PCB TYPE K326	POS 9516	88808326		24	24	0	£237.36
0007920557	PCB VGA	PCNDNOKIAC	7920557		16	12	4	£332.64
0080062025	PCB VGA 8214	PC1PM75BAS	80062025		1	0	1	£57.87
0007763313	PCB VGA AT1 M75/20/33	PCP M7520	7763313		5	0	5	£833.55
0007761730	PCB VGA M50/55/16/20	PC1PM50-00	7761730		5	0	5	£522.00
0007763236	PCB VGA M50/55/16/20 (ACUMOS)	PC1PM50-00	7763236		2	0	2	£71.68
0080062109	PCB VGA MX486	PCP M95-20	80062109		3	0	3	£144.96
0080061030	PCB VGA VIDEO	PWS VGAVIB	VGA8		11	10	1	£1,100.99
0007739267	PCB VIDEO	PCDUMKOKMK	30004		9	0	9	£634.14
0007731446	PCB VIDEO BRD	PCDUM2000C	10050		11	2	8	£1,812.25
0007756729	PCB VIDEO PCB FOR 6404/02	PDCUCKOK73	7756729		6	2	4	£1,255.50
0007920333	PCB XC TRANS ADAPTER BOARD SYNC/ASYNC	PCNDNOKIAC	7920333		1	1	0	£12.20
0080019789	PCB XEBEC CONTROLLER 1410	PC2 MODEL2	80019789		43	22	21	£4,105.64
0007769262	PCB???	PP2125	B17B-1410-0480A		1	1	0	£1,281.28
0007769263	PCB???	PP2125	B17B-1410-0470A		1	1	0	£828.10

Disp4

4901576591	PCB	S10	4901576591		1	0	1	£70.67
0007706017	PCB (UNOBTAINABLE) HEAT SINK	S10	7706017		10	0	10	£1,403.00
0007769508	PCB 128K MEM THRU CON RX5741	SPECRETAIL	SHP2068		7	0	7	£455.00
0007728481	PCB 128K MEMORY	SPECRETAIL	22100		3	2	1	£2,923.20

0007771240	PCB 16 BIT JUMPERLESS ENET	SPECRETAIL	249227	2	2	0	0	£160 08
0007769078	PCB 16MB MEMORY FOR NCR TOWER	SPECRETAIL	150-0008343	2	0	2	0	£1,639 08
0005307545	PCB 1936 (BASIC)	SPECNETWK	5307545	1	0	1	0	£209 35
0005308424	PCB 1945	SPECNETWK	5308424	2	2	0	0	£159 14
0007702299	PCB 1UDV	S10	7702299	1	0	1	0	£40 12
0007702301	PCB 1WZV DIFFERENCE COUNT	S10	7702301	2	0	2	0	£133 84
0007775903	PCB 2 PORT PC SERIAL	SPECRETAIL	7775903	9	9	0	0	£167 04
0007770912	PCB 2 SERIAL 1 PARALLEL PORT EXPANSION	SPECRETAIL	AT10-V8(PART OF COMPUADD)	1	1	0	0	£120 00
0085199218	PCB 2840 VAR 2	SERVICE AI	85199218	1	0	1	0	£34 64
0084207216	PCB 2892	UNKNOWN MA	84207216	2	1	1	0	£39 74
4900890786	PCB 2FQJ ANALOG GATE AMP	S10	4900890786	2	0	2	0	£80 02
4900890784	PCB 2JAV	S10	4900890784	2	0	2	0	£363 96
0007771407	PCB 2MB MEMORY	SPECRETAIL	530-0023295	20	18	2	0	£8,800 00
0080212610	PCB 2ND SCANNER I/F FOR ECLIPSE CONTROL UNIT	SCNRECLIPS	52322001	3	3	0	0	£153 12
4901217383	PCB 3JTV	S10	4901217383	2	0	2	0	£111 14
0007766314	PCB 4 PORT BUFFERED SERIAL CARD	SPECRETAIL	120-CC/4B	2	1	1	0	£592 76
0007769513	PCB 4 PORT CARD	SPECRETAIL	INP0001FPC	13	8	5	0	£1,950 00
4901425864	PCB 4JUV	S10	4901425864	2	0	2	0	£406 78
0007766158	PCB 4MB FILE IT	SPECRETAIL	COM0034	6	6	0	0	£7,864 80
0007769511	PCB 7 SEGMENT DISPLAY OMRON	SPECRETAIL	5531015	8	0	8	0	£1,200 00
0007766151	PCB 8 BIT ETHERNET	SPECRETAIL	SMC LAN-EPRE	9	0	9	0	£647 28
0007763281	PCB 8 PORT V35 PI DPN	SPECNTWK	7763281	1	1	0	0	£1,109 16
0007761836	PCB 8MHZ MOD BMF021105R	SPECRETAIL	PCLID 8MHZ	3	3	0	0	£1,374 60
0765530562	PCB 9FQJ ANALOG GATE SPL	S10	765530562	2	0	2	0	£80 24
0007767226	PCB ACK 2780 SYNKARD	SPECRETAIL	85230	8	0	8	0	£835 20
0007706004	PCB ADDRESS LOGIC 1	S10	7706004	4	2	2	0	£456 20
0007706005	PCB ADDRESS LOGIC 2	S10	7706005	4	2	2	0	£378 28
0007819265	PCB ALARM INTERFACE DPN	SPECNTWK	NT9P31	3	2	1	0	£1,589 22
0007767603	PCB ANALOG FOR MODEL 2010 COMPACT SCANNER	SCN2010	B4062	3	0	3	0	£295 80
0007766220	PCB APT CHECK-IT 2	SPECRETAIL	POS 0060-APT	4	2	2	0	£1,856 00
0007766221	PCB APT E2POS 2/2	SPECRETAIL	E2POS 2/2	3	0	3	0	£696 00
4901916303	PCB ASSY CRT CONTROL	S25	4901916303	146	3	143	0	£25,675 56
0035908660	PCB ASSY G374 + PATCHCORDS	S39	35908660	4	4	0	0	£3,014 84
0088804428	PCB ASSY G428	S39 L80	88804428	1	1	0	0	£420 65
4901275739	PCB ASSY I/F 1	S10	4901275739	5	0	5	0	£1,886 80
4901275740	PCB ASSY I/F 2	S10	4901275740	5	0	5	0	£540 45
0088808462	PCB ASSY K462	S39	88808462	1	0	1	0	£481 63
0007849386	PCB AT HOST ADAPTOR + 1 X TAB ADAPTOR	TMLTEAMWAR	7949386	7	0	7	0	£2,084 96
0005518427	PCB AUX PSU I/F	TS3 KS	5518427	1	0	1	0	£47 24
0007702304	PCB AVVY	S10	7702304	2	0	2	0	£80 24
0007751353	PCB AW RIBBON CABLE FINGER BRD	S10	7751353	4	4	0	0	£22 32
0007707449	PCB AWMV	S10	7707449	1	1	0	0	£60 76
0088825002	PCB B002 SCSI	S25	88825002	1	0	1	0	£740 00
0088825006	PCB B006 8 CHANNEL ASYNCHRONOUS E COUPLER	S25	88825006	17	7	10	0	£5,630 40
0088825007	PCB B007 UNIX APPLICATION PROCESSOR	S25	88825007	10	4	6	0	£8,730 60
0088825008	PCB B008 8MB UNIX STORE	S25	88825008	10	3	7	0	£5,417 30
0088825010	PCB B010 1 COUPLER	S25 ICPLR	88825010	1	0	1	0	£395 48
0088825016	PCB B016 16MB UNIX STORE	S25	88825016	5	4	1	0	£4,797 65
0088825042	PCB B042 SINGLE BOARD PROCESSOR	S25	88825042	8	0	8	0	£2,820 16
0088825088	PCB B088 CONTROL BOARD	S25 M405	88825088	11	4	7	0	£560 34
0005152810	PCB BA02 S CONTROLLER-VERSN 2	S25/2 PROC	5152810	34	14	20	0	£4,756 84
0005152862	PCB BA03 T COUPLER VERSION 2	S25/2 PROC	5152862	121	10	111	0	£21,369 81
0005153168	PCB BA04 U1 CON VSN 2	S25 U CTLR	5153168	3	0	3	0	£369 72
0005153674	PCB BA05 IP1 VERSION 2	S25/2 PROC	5153674	23	17	6	0	£3,490 02
0005152010	PCB BA06 IP2	S25/2 PROC	5152010	25	14	11	0	£3,302 75
0005153019	PCB BA07 CP VERSN 2	S25/2 PROC	5153019	14	1	13	0	£2,131 64
0005155859	PCB BA07 CP VSN4	S25	5155859	88	0	88	0	£40,663 92
0005152014	PCB BA10 FL DISC ADAPTOR	S25 DIS AD	5152014	12	5	7	0	£2,883 84
0005152044	PCB BA15 C COUPLER	S25 C COUP	5152044	20	19	1	0	£3,358 80

0005152047	PCB BA16 U2 CONTROLLER	S25 U CTRL	5152047	4	0	4	£421 52
0005152056	PCB BA19 CLOCK MODULE	S25 CLOCK	5152056	15	3	12	£2,284 50
0005152159	PCB BA24 I/O (6 WAY)	S25/2 PROC	5152159	19	17	2	£242 25
0005152187	PCB BA26 UZUFAC I/C	S25 U CTRL	5152187	1	0	1	£64 36
0005152226	PCB BA27 MICROP ADAPTOR	S25/2 PROC	5152226	24	8	16	£3,203 52
0005152225	PCB BA28 STORE 80K	S25/2 PROC	5152225	23	7	16	£5,169 71
0005152351	PCB BA31 R COUPLER	S25/2 PROC	5152351	32	0	32	£12,591 04
0005152590	PCB BA32 SMD/MMD AD1	S25 EDS80	5152590	104	5	99	£16,962 40
0005152592	PCB BA33 SMD/MMD AD2	S25 EDS80	5152592	74	12	62	£16,224 50
0005152816	PCB BA34 M CONTRLR	S25 MT CPL	5152816	10	4	6	£2,108 30
0005153577	PCB BA46 IP3	S25	5153577	19	0	19	£8,824 17
0005153580	PCB BA47 FILE CONTR	S25	5153580	3	0	3	£647 58
0005153860	PCB BA50 G CONTRLR	S25	5153860	19	14	5	£19,281 96
0005153702	PCB BA54 320K STORE (WHOLE UNIT 003423704)	S25 STORE	5153702	65	9	56	£20,358 00
0005154341	PCB BA56 ICP VERSION 2	S25	5154341	50	20	30	£11,432 50
0005154175	PCB BA59 401C T CPLR	S25 4IOC T	5154175	48	12	36	£9,162 24
0005154057	PCB BA63 V PCA84	S25	5154057	3	0	3	£562 08
0005155001	PCB BA97	S25	5155001	2	0	2	£1 84
0007728493	PCB BARRIER CARD V24	SPECRETAIL	27780	3	3	0	£516 72
0005158845	PCB BB02 V3 SINGLE BRD PROC	S25 S/B PR	5158845	44	1	43	£21,323 28
0005158939	PCB BB04 PWA LIST VER 2	S25	5158939	11	6	5	£9,286 20
0005157195	PCB BB04 SMD I/F ADAPTOR	S25	5157195	1	0	1	£397 73
0005155537	PCB BB26 COMMS CPLR	S25	5155537	7	5	2	£1,229 06
0005155538	PCB BB27 T/D COUPLER	S25	5155538	14	8	6	£3,083 50
0005156238	PCB BB32 (RMA)	S25	5156238	34	0	34	£4,720 22
0005156566	PCB BB33 (RECLAIM ONLY) A D C CLOCK FOR SYS25	SYS25	5156566	2	1	1	£300 00
0005158920	PCB BB45 FOR CCPM APPL PROC	S25 APPPRO	5158920	9	7	2	£3,361 59
0005157139	PCB BB59 4T COUPLERS	S25 S25 PL	5157139	99	0	99	£33,095 70
0005158108	PCB BB63 MEMORY	S25 M80 VD	5158108	1	0	1	£44 64
0088829087	PCB BB87	S25 CP/DUA	88829087	1	0	1	£51 21
4950163701	PCB BBU	S10	4950163701	6	0	6	£671 82
0007702302	PCB BCWV ACCESS CONTROL	S10	7702302	1	0	1	£46 62
0080155244	PCB B1SYNC COMMS	SPECUSA	80155244	3	2	1	£69 60
0007728489	PCB BLOCK LEVEL PROCESS	SPECRETAIL	22698	18	11	7	£16,683 12
0088825012	PCB BO12 X COUPLER	S25	88825012	1	1	0	£441 65
0088825027	PCB BO27 T/D COUPLER	S25 PLUS	88825027	19	0	19	£7,186 18
0007758455	PCB BR5 DATEX 100	SPECNETWK	95UAP00016AAA	6	0	6	£541 32
0007763284	PCB BRUMBY 4 PORT ASYNC	SPECRETAIL	BRD005-MMB	11	8	3	£6,316 20
0007771408	PCB BUS (BACKPLANE) NCR 600 TOWER	SPECRETAIL	530-244808	3	3	0	£990 00
0007728482	PCB BUS CONTROLLER	SPECRETAIL	22897	7	2	5	£6,728 68
0007769439	PCB CENT RZ5700	SPECRETAIL	SHP2053	53	46	7	£3,830 31
0007728490	PCB CLP 4 LINE SYNC/A	SPECRETAIL	22699	18	5	13	£14,407 20
4901451702	PCB CMMM	S10	4901451702	12	3	9	£5,555 28
4901985005	PCB CNTR N/F (W/SQ LED)	S25 M85C V	4901985005	20	6	12	£5,071 80
0007758308	PCB CO-PROCESSOR	SPECRETAIL	COM0020	9	8	1	£3,915 00
0007771600	PCB COMMAND CABLE	SPECRETAIL	530-002362A	3	3	0	£609 00
0007761673	PCB COMMIT 3	SPECRETAIL	COM0050	5	5	0	£1,653 00
0007761744	PCB COMMIT 4 CLUSTER	SPECRETAIL	COM0080	4	2	2	£1,531 20
0007761745	PCB COMMIT 4 SPLITTER	SPECRETAIL	COM0081	1	1	0	£156 60
0007819269	PCB COMMON MEMORY CM16 DPN	SPECNTWK	NT9P27	5	0	5	£6,720 70
4901968401	PCB COMMS (2384)	S25 M84 VI	4901968401	38	9	29	£4,708 20
0007771211	PCB CONNECT BOARD	SPECRETAIL	93F1790	2	2	0	£100 00
0007760621	PCB CONTROLLER IMAGE LABELLING	SPECRETAIL	ME29S	3	0	3	£915 24
0007728483	PCB CPLN 1-CP	SPECRETAIL	22748	16	3	13	£25,909 76
0007728484	PCB CPLN 2-LN	SPECRETAIL	22750	14	9	5	£12,974 92
4902418702	PCB CRT CNTRLR 3	S25 M89 VD	4902418702	4	0	4	£278 40
4901985004	PCB CRT CONTROL (BASIC)	S25 M85C V	4901985004	169	24	145	£29,945 11
4902478814	PCB CRT CONTROLLER 3 FUNC	S25 M90 VD	003-9024788-14	1	0	1	£69 60
0007728353	PCB CRT SCAN(MOTOROLA)	S25	7728353	12	0	12	£1,135 20

4901100701	PCB CX0001	S10	4901100701	10	2	8	£869 10
4901360101	PCB CX0002	S10	4901360101	4	3	1	£462 08
4950072801	PCB CZ4B	S10F	4950072801	1	0	1	£104 25
0007735800	PCB CZQM ANALOG	SW3	7735800	1	0	1	£465 24
0007735789	PCB CZQM ENCODER/DECODER	SW3	B16B-8370-0010A	9	8	1	£626 40
0007767137	PCB D-LINK 10 BASE T DE-220T	SPECRETAIL	DE-220T	15	0	15	£938 60
0088836534	PCB D534 OPERATOR PANEL	TEAMPOS	88836534	44	44	0	£818 28
4950085301	PCB DBCC	S10	4950085301	20	2	18	£1,897 40
0007715815	PCB DCS	S10	7715815	1	1	0	£58 50
4901260673	PCB DCWV	S10	4901260673	1	1	0	£207 28
0007706015	PCB DECODER	S10	7706015	4	4	0	£226 20
4901191969	PCB DEFLECTION REGULATOR	S10	4901191969	24	5	19	£12,803 84
0007771597	PCB DHP5IO DUAL 16 PORT	SPECRETAIL	530-24816	2	1	1	£700 00
0007769697	PCB DIGIBOARD	SPECRETAIL	IBD8 /IPC202	13	1	12	£1,560 00
0007767604	PCB DIGITAL FOR MODEL 2010 COMPACT SCANNER	SCN2010	B4060	2	1	1	£301 60
0007769271	PCB DISC CONNECT FOR NCR 7052 POS TERMINAL	SPECRETAIL	250-0043127	8	8	0	£352 64
0007771406	PCB DISC CONTROLLER	SPECRETAIL	530-0024410	3	0	3	£750 00
0007771588	PCB DISC CONTROLLER HPMSD SCSI	SPECRETAIL	348-0017398D	1	0	1	£774 88
4901400680	PCB DISPLAY CONTROLLER	S10	4901400680	1	0	1	£264 90
0007756645	PCB DRIVE CONTROL	SW4	7756645	11	1	10	£7,789 44
4950080201	PCB DRRC	S10	4950080201	7	3	4	£500 71
4950121901	PCB DRWB	S10	4950121901	6	0	6	£593 04
4901238701	PCB DSC1	S10	4901238701	9	3	6	£620 64
4901239401	PCB DSC2	S10	4901239401	11	2	9	£1,006 72
4950081501	PCB DSC5	S25 U CTLR	4950081501	8	3	5	£650 80
0007735802	PCB DUAL CHANNEL	SW3	B16B-8380-0010A	13	8	5	£3,566 03
0007702300	PCB DWEV RW/E FAULT	S10	7702300	1	0	1	£40 12
0007732326	PCB ELECTRONICS	S25	ASY5023	28	10	18	£1,745 80
0007750398	PCB ELECTRONICS	S25	ASY5136	6	5	1	£547 92
0007722026	PCB ENCODE DECODE	S10	7722026	2	0	2	£449 94
0007767119	PCB ETHERNET I/F FOR HOSPITALITY TERMINAL	SPECRETAIL	7767119	6	2	4	£17 78
0007769506	PCB EXP RAM 128K RZ5700	SPECRETAIL	SHP2065	1	0	1	£150 00
0007769507	PCB EXP RAM 256K RZ5700	SPECRETAIL	SHP2066	22	17	5	£3,520 00
0007819704	PCB FILE I.T.2MB	SPECRETAIL	COM003070	17	7	10	£15,381 60
4902417601	PCB FIXED DISC CONTROLLER WITH PROMS	SPECUSA	4902417601	8	5	3	£1,964 40
4901359501	PCB FO261300 LX001	S10F	4901359501	5	1	4	£300 20
0034901092	PCB G092 STORE BD 256K	S39 L30	34901092	17	8	9	£2,711 50
0034901093	PCB G093 U PROG ST 32K	S39 L30	34901093	24	10	14	£2,495 52
0034901097	PCB G097 MESSAGE BUFFER	S39 L30	34901097	11	0	11	£1,043 02
0034901098	PCB G098 SCRATCHPAD	S39 L30	34901098	24	4	20	£1,527 84
0034901099	PCB G099 CONT RAM	S39 L30	34901099	33	7	26	£2,366 10
0034901100	PCB G100 DATA SLAVE	S39 L30	34901100	13	4	9	£1,162 33
0034901101	PCB G101	S39 L30	34901101	1	0	1	£71 85
0034901103	PCB G103 AC CONT	S39 L30	34901103	1	0	1	£161 81
0034901104	PCB G104 ETHERNET 1	S39 L30	34901104	2	1	1	£331 76
0034901108	PCB G108 STORE	S39 L30	34901108	9	6	3	£545 22
0034901109	PCB G109 SCHEDULER	S39 L30	34901109	15	13	2	£1,624 35
0034901111	PCB G111 PANEL DISP	S39 L30	34901111	1	0	1	£179 94
0034901113	PCB G113	S39 L80	34901113	10	3	7	£427 60
0034901115	PCB G115 PLO	S39 HSPC	34901115	9	0	9	£1,948 41
0034901117	PCB G117	S39 L80	34901117	16	0	16	£1,280 96
0034901118	PCB G118	S39 L80	34901118	2	0	2	£1,265 56
0034901119	PCB G119	S39 L80	34901119	1	0	1	£100 87
0034901120	PCB G120	S39 L80	34901120	3	0	3	£195 48
0034901141	PCB G141	S39 L30	34901141	7	0	7	£1,200 15
0034901144	PCB G144 TQ TERM	S39 L30	34901144	1	0	1	£67 15
0034901167	PCB G167 U PROG LOG	S39 L30	34901167	7	6	1	£289 24
0034901170	PCB G170 PORT FIBRE TXCR	S39 L30	34901170	1	0	1	£478 71
0034901171	PCB G171 PORT SW TX/RX	S39 L30	34901171	2	0	2	£593 74

0034901174	PCB G174 SATELLITE	S39 L30	34901174	4	1	3	£790.28
0034901175	PCB G175 SATELLITE	S39 L30	34901175	8	0	8	£1,586.88
0034901184	PCB G184 CL TERM	S39 L30	34901184	1	0	1	£14.05
0034901186	PCB G186 DVB CLOCK	S39 L30	34901186	3	1	2	£111.60
0034901205	PCB G205	S39 L80	34901205	4	4	0	£289.80
0034901206	PCB G206	S39 L80	34901206	3	0	3	£241.56
0034901210	PCB G210	S39 L30	34901210	3	1	2	£158.22
0034901214	PCB G214	S39 L80	34901214	5	0	5	£537.30
0034901219	PCB G219	S39 L80	34901219	4	2	2	£1,009.12
0034901245	PCB G245	S39 L80	34901245	7	2	5	£595.28
0034901277	PCB G277	S39 L30	34901277	8	6	2	£427.68
0034901280	PCB G280	S39 L30	34901280	8	5	3	£179.12
0034901300	PCB G300	S39 L80	34901300	19	16	3	£2,062.26
0034901301	PCB G301	S39 L80	34901301	5	0	5	£422.70
0034901303	PCB G303	S39 L80	34901303	4	3	1	£1,014.20
0034901304	PCB G304	S39 L80	34901304	40	0	40	£5,330.00
0034901307	PCB G307	S39 L30	34901307	5	1	4	£3,058.40
0034901341	PCB G341 LINK BOARD	S39 L35D	34901341	3	3	0	£392.07
0034901350	PCB G350	S39	34901350	1	0	1	£262.36
0034901351	PCB G351	S39	34901351	4	1	3	£628.12
0034901356	PCB G356 RAM FOR OCP	S39-DX	34901356	2	0	2	£657.70
0034901371	PCB G371 TX/RX	S39 L30	34901371	9	1	8	£1,943.10
0035908379	PCB G371 WITH FIOPTIC C/F 285MM LG	S39 L30	35908379	58	50	8	£15,528.92
0035908324	PCB G372 PLUS OPTICAL SW	S39 L30	35908324	8	1	7	£5,013.04
0034901380	PCB G380 NSC	S39 L35D	34901380	1	1	0	£166.81
0034901385	PCB G385	S39 L35	34901385	1	0	1	£61.42
0034901394	PCB G394 NSC ASSY	S39 L35D	34901394	11	10	1	£2,192.63
0034901401	PCB G401	S39 L30	34901401	9	0	9	£1,380.60
0088804409	PCB G409 DECODE	S39 L30	88804409	21	17	4	£1,524.60
0088804418	PCB G418 CHANNEL TX/RX CONTROL LIST	S39	88804418	2	2	0	£73.18
0088804432	PCB G432 FUNCT ASSY	S39 HSPC	88804432	10	0	10	£1,132.20
0088804440	PCB G440	S39	88804440	1	0	1	£76.30
0088804442	PCB G442 DATA STORE 0 ASSY	S39	88804442	1	0	1	£136.90
0088804444	PCB G444 DATA STORE 0 ASSY	S39 L30	88804444	13	7	6	£1,221.22
0088804450	PCB G450 SEQ PROM	S39 L30	88804450	6	0	6	£344.82
0088804451	PCB G451 MESS BUFF	S39 L30	88804451	13	1	12	£1,248.13
0088804452	PCB G452 DATA ST	S39 L30	88804452	22	11	11	£2,324.96
0088804453	PCB G453 PROG PROM	S39 L30	88804453	16	7	9	£1,106.72
0088804454	PCB G454 WKG STORE	S39 L30	88804454	16	2	14	£1,031.68
0088804455	PCB G455 IMAGE STR	S39 L30	88804455	10	0	10	£964.20
0088804456	PCB G456 CLOCK	S39 L30	88804456	20	14	6	£1,647.80
0088804457	PCB G457 START SEQ	S39	88804457	15	12	3	£610.20
0088804459	PCB G459	S39 L30	88804459	19	0	19	£720.67
0088804460	PCB G460 DISC FORM	S39 L30	88804460	7	4	3	£501.34
0088804465	PCB G465 DATA	S39 L30	88804465	7	5	2	£360.01
0088804466	PCB G466 TX	S39 L30	88804466	9	5	4	£632.43
0088804467	PCB G467 RX	S39 L30	88804467	18	0	18	£1,678.68
0088804468	PCB G468 DISPLAY DRIVE	S39 L30	88804468	1	0	1	£168.76
0088804473	PCB G473	S39 L30	88804473	12	9	3	£1,101.96
0088804474	PCB G474 LCMT TX	S39 L30	88804474	4	2	2	£437.64
0088804475	PCB G475 LCMT RX	S39 L30	88804475	1	0	1	£124.49
0088804476	PCB G476 EAGLE TX	S39 L30	88804476	9	0	4	£395.52
0088804477	PCB G477	S39 L30	88804477	4	0	9	£1,254.06
0088804478	PCB G478	S39 L30	88804478	7	6	1	£415.45
0088804479	PCB G479 TX	S39 L30	88804479	15	9	6	£827.85
0088804480	PCB G480 RX	S39 L30	88804480	7	6	1	£589.61
0088804481	PCB G481 DATA	S39 L30	88804481	4	0	4	£51.04
0088804482	PCB G482 GTS TX	S39 L30	88804482	3	0	3	£379.02
0088804483	PCB G483 GTS RX	S39 L30	88804483	9	0	9	£1,431.63
0088804485	PCB G485	S39 CAFS	88804485	9	0	9	

0088804486	PCB G486	S39 CAFS	88804486	19	0	19	£1,752.75
0088804487	PCB G487	S39 L30	88804487	6	2	4	£159.60
0088804494	PCB G494	S39 CAFS	88804494	16	4	12	£2,408.48
0088804495	PCB G495 SW DISC PANEL	S39 L30	88804495	4	3	1	£667.80
0088804496	PCB G496 DC CONTROL	S39 L30	88804496	18	0	18	£4,804.02
0088804497	PCB G497 DC CONT D	S39 L30	88804497	4	0	4	£314.24
0088804498	PCB G498	S39	88804498	25	19	6	£4,296.00
0088800654	PCB G654	S252 PROC	88800654	1	0	1	£96.63
0080031363	PCB G714 VESRION 2	SERVICE AI	80031363	1	1	0	£2.29
0088800854	PCB G854	SPECRETAIL	88800854	31	3	28	£3,647.46
0088800871	PCB G871	S39 L80	88800871	9	2	7	£1,442.16
0088800873	PCB G873	S39 L80	88800873	4	3	1	£648.68
0088800881	PCB G881	S39 HSPC	88800881	4	1	3	£480.00
4902030701	PCB GROUND OPTION	S25 M84 VI	676149	8	4	4	£213.28
0007771405	PCB HPSIO	SPECRETAIL	530-0025310	15	11	4	£2,250.00
4901275749	PCB I/F & RESET	S10	4901275749	1	0	1	£64.75
0007715817	PCB I/F ADAPTOR ASSY 1	S10	7715817	2	1	1	£118.90
0007715818	PCB I/F ADAPTOR ASSY 2	S10	7715818	2	0	2	£313.92
0007756644	PCB I/F CONTROL	SW4	B17B-1360-0010AVJ	13	7	6	£8,828.04
0007715814	PCB I/O 1	S10	7715814	2	1	1	£125.24
4950120501	PCB IACB 2	S10	4950120501	20	6	14	£2,581.20
4902446602	PCB IBC/RTC	SPECUSA	4902446602	2	1	1	£712.44
0007759792	PCB INTELLIGENT SERIAL CARD B PORT	SPECRETAIL	INT 001/8	8	8	0	£3,480.00
0007769722	PCB INTERFACE FOR SHARP BAR CODE READER	SPECRETAIL	RZ-8627	8	8	0	£560.00
0007769717	PCB INTERFACE PARALELL CITIZEN	SPECRETAIL	Y8300	1	0	1	£30.16
0765530501	PCB ITDV TRANSMITTER	S10	765530501	4	2	2	£160.48
4900890722	PCB IWDV	S10	4900890722	4	2	2	£12.20
0007728509	PCB K/B/D	SPECRETAIL	23508	2	0	2	£668.12
4901191919	PCB K/B/D NUM CONTROL	S10	4901191919	4	3	1	£462.96
4901191970	PCB K/B/D STANDARD	S10	4901191970	8	3	5	£699.52
0088808663	PCB K663 CONTROL PANEL	TITAN	88808663	36	36	0	£459.36
0088808664	PCB K664 MOTHERBOARD	TITAN	88808664	2	0	2	£2,547.68
0088808665	PCB K665 BACKPLANE	TITAN	88808665	11	11	0	£574.20
0088808666	PCB K666 COMMS	TITAN	88808666	30	17	13	£7,843.80
0088808763	PCB K763 DISC ADAPTOR	TS3 KS	88808763	7	0	7	£2,579.22
0080212895	PCB K766 HI DATA RAID CONTROLLER	TS3 RAID H	80212895	2	2	0	£13,922.98
0007769445	PCB KEYBOARD INT SHARP RZ5700	SPECRETAIL	SHP2059	71	60	11	£6,971.49
0007737550	PCB KGBM LOGIC I/F	SW3	B16B-9360-0020A	11	5	6	£7,051.66
0007736914	PCB KGKM	SW3	B16B-9340-0030A	16	9	7	£17,708.48
0088803588	PCB KP588 PLATTER	S39 CAFS	88803588	7	5	2	£5,720.47
4901545201	PCB LARA	S10	4901545201	5	1	4	£325.35
0035210255	PCB LARGE W255	S39 HSPC	35210255	5	2	3	£6,352.35
4901585101	PCB LDXA	S10	4901585101	10	3	7	£722.40
0007740584	PCB LED EXT (WHEN STOCK EXHAUSTED USE 7740850)	SERVICE AI	7740584	1	0	1	£590.66
4901669901	PCB LINE UNIT 1	S25	4901669901	33	8	25	£3,361.71
4901400688	PCB LINE UNIT 2	S10	4901400688	18	1	17	£1,869.12
4901400686	PCB LINE UNIT II	S10	4901400686	5	1	4	£383.15
4902027301	PCB LIST CONTROLLER DPN	S25	005-9020273-01	110	16	94	£20,178.40
0007819281	PCB LIXA	SPECNTWK	QPA12	4	4	0	£13,306.64
4901507901	PCB LOGIC	S10	4901507901	11	1	10	£905.63
0007728511	PCB LOGIC (MT350/360)	SPECRETAIL	23506	5	5	0	£10,904.00
0007770685	PCB LOGIC 3	SPECRETAIL	047186	1	1	0	£688.89
0007722475	PCB LOGIC POWER SUPPLY	S10	7722475	5	2	3	£958.60
4901224318	PCB LRXA	S10	4901224318	1	0	1	£60.00
4901503901	PCB LU1	S10	4901503901	14	1	13	£981.82
4900033700	PCB LU2	S10	4900033700	1	0	1	£40.16
4900034000	PCB LX002	S10	4900034000	3	3	0	£138.57
4901359801	PCB M/F I/O B317 I/F	S10F	671063	4	4	0	£324.80
0088825317		TS3 KI	68825317	3	3	0	£440.91

0007758307	PCB MAGNETLINK	SPECTRETAIL	MAG0040	15	9	6	£6,003.00
0007769492	PCB MAIN BOARD INPHASE	SPECTRETAIL	INF0001MB	21	3	18	£3,654.00
0007771645	PCB MAIN CPU PMC V	SPECTRETAIL	530-0033225	1	1	0	£1,009.20
00077728480	PCB MARG & OV PROTECTOR	SPECTRETAIL	22594	2	1	1	£468.66
0080212609	PCB MDL (SDL)IFACE FOR ECLIPSE CONTROL UNIT	SCNRECLIPS	51108/001	5	5	0	£112.25
0007771409	PCB MEMORY BUS	SPECTRETAIL	530-0023677	4	4	0	£1,000.00
0007771687	PCB MEMORY BUS	SPECTRETAIL	530-0028759	1	1	0	£574.20
0007814980	PCB MLWB	SPECUSA	7814980	3	3	0	£28.14
0088808614	PCB MODULAR PROX DETENT	SCNR ORION	88808614	85	83	2	£1,127.10
0007732324	PCB MOTOR SPEED CONTROL	S25	ASY5024	58	12	46	£1,416.94
4950121501	PCB MTI OC3	S10	4950121501	12	2	10	£2,063.52
0005158227	PCB MTIOC I/F ASSY 8B58	S25 M91 VI	5158227	42	0	42	£10,178.70
0007771688	PCB MULTIBUS MOTHERBOARD	SPECTRETAIL	530-0032449	1	1	0	£200.00
4902404801	PCB N PROCESSOR WITH PROMS	SPECUSA	4902404801	1	1	0	£158.91
0007765383	PCB NE2000 NORVELLE CARD	SPECTRETAIL	888-000556-002	15	0	15	£1,078.80
0765530567	PCB OAFN HEAD SELECT SPL	S10	765530567	1	0	1	£40.12
0765530498	PCB OCAV VOLT ERROR DETECTOR	S10	765530498	2	0	2	£80.24
0765530443	PCB OCPV READ RECOVERY	S10	765530443	2	0	2	£80.24
0007750880	PCB OCR KBD/PRL	SCNROCR	015-0214-004	12	5	7	£7,565.88
0007703201	PCB OCRV/PLUG	SPECUSA	7703201	2	2	0	£958.76
0765530444	PCB OCSV DIA CONVERTOR	S10	54116501	1	1	0	£182.53
0765530446	PCB OCVV CDC 54-117301	S10	765530446	2	0	2	£80.24
0765530447	PCB OCXV SERVO 3	S10	765530447	1	1	0	£232.07
0007702306	PCB OCXV	S10	7702306	4	1	3	£186.48
0007760409	PCB ONYX X25 NDL	SPECTRETAIL	AA0001	15	12	3	£21,054.00
0765530496	PCB OPAV INDICATOR DRIVER	S10	765530496	2	0	2	£80.02
4900890703	PCB ORFV	S10	4900890703	2	0	2	£467.18
0765530487	PCB OSAV SWITCH RECEIVER	S10	765530487	1	0	1	£248.84
0765530503	PCB OSBV SECTOR DEMOULATOR	S10	765530503	2	0	2	£82.40
4901630612	PCB OSC	S10	4901630612	3	3	0	£236.64
4901338948	PCB OSC + DATA DEC 56	S10	4901338948	2	1	1	£89.04
4900890775	PCB OWJV	S10	4900890775	3	1	2	£661.02
0765530508	PCB OWVY CON SEL/FUNCT-STEER	S10	765530508	3	1	2	£120.36
0088803516	PCB P516	S39 L80	88803516	9	4	5	£1,252.80
0088803554	PCB P554	S39 CAFS	88803554	8	0	8	£2,725.84
0088803586	PCB P586	S39 CAFS	88803586	24	13	11	£8,205.84
0007819254	PCB PBUS EXTENDER DPN	SPECNTWK	OPA152C	1	0	1	£122.96
0007819271	PCB PI 1 PORT V35/V24/SCSI DPN	SPECNTWK	OPA137	5	4	1	£4,421.50
0007819272	PCB PI 1 PORT X21/V24/SCSI DPN	SPECNTWK	OPA182	20	0	20	£15,934.40
4950103501	PCB PIC2	S10	4950103501	4	3	1	£734.36
0007766222	PCB POS EZPOS 1/2	SPECTRETAIL	EZPOS 1/2	1	0	1	£162.40
0007761679	PCB POS LINK MK2 B CHANNEL	SPECTRETAIL	POS0040	6	3	3	£2,088.00
0007758309	PCB POSLINK B CHANNEL	SPECTRETAIL	POS0010	8	5	3	£1,670.40
0007703250	PCB POSN TRSDUCER PREAMP	S10	7703250	3	1	2	£869.39
0007761672	PCB POSNET 4	SPECTRETAIL	POS0030	3	2	1	£1,566.00
0007756647	PCB POWER AMPLIFIER	SW4	B17B-0700-0020AMU	5	0	5	£1,216.35
0007710671	PCB POWER AMPLIFIER	S10	7710671	11	2	9	£2,433.97
0007703912	PCB POWER DRIVER	S10	7703912	4	1	3	£488.72
0088840623	PCB POWERCACHE XL S623	TS2 POWER	88840623	2	0	2	£1,843.04
0007769440	PCB PRINT RZ5700	SPECTRETAIL	SHP2054	67	45	22	£7,284.91
0007750873	PCB PRLL L ADAPT - ICL	SCNROCR	015-0230-004	1	0	1	£82.42
0007819263	PCB PROC ELEMENT PE286AA DPN	SPECNTWK	N19P26	2	0	2	£5,164.74
4900547808	PCB PROCESSOR	S10	4900547808	2	1	1	£159.68
0088808765	PCB PROCESSOR 40 MHZ SSMOD	TS1 ES E37	80212757	24	19	5	£11,249.52
0007769074	PCB PROCESSOR NCR TOWER	SPECTRETAIL	150-0015452	3	0	3	£3,027.60
4901915302	PCB PSU	S25 M89 VD	4901915302	18	3	15	£2,445.12
0007771482	PCB PSU FOR NCR 2155	SPECTRETAIL	230-0066452	2	0	2	£240.00
0007728510	PCB RASTOR GENERATOR	SPECTRETAIL	23509	7	5	2	£3,978.80
4901507001	PCB RAXA	S10	4901507001	4	1	3	£531.68

4950076701	PCB RBXB	S10	4950076701	5	2	3	£394.50
4901534101	PCB RDXA	S10	4901534101	14	1	13	£996.52
0007722022	PCB READ WRITE	S10	7722022	2	1	1	£415.76
0007710169	PCB RELAY 73676303	S10	73676303	5	0	5	£1,224.50
0007706016	PCB RETIMER	S10	7706016	4	2	2	£417.24
0007769450	PCB RF MODULATOR RZ5700	SPECRETAIL	SHP2064	67	59	8	£6,852.76
0007767429	PCB RS232 I/F FOR SLIMLINE 1000	SCNCAROL2	CA02244-J001	1	1	0	£117.84
0080212604	PCB RS232 I/FACE FOR ECLIPSE CONTROL UNIT	SCNRECLIPS	CA02378-J051	1	0	1	£34.80
0007771686	PCB RS232 SMD	SPECRETAIL	S30-0031832	2	2	0	£500.00
0088803936	PCB S936	S10	88803936	9	9	0	£8,487.83
0005309976	PCB S940/90	SPECNETWK	5309976	12	10	2	£4,249.20
0007771403	PCB SATELLITE (ONE SHOT)	SPECRETAIL	530-0028209	3	3	0	£1,642.56
4902400902	PCB SCB (UK)4902400903	SPECUSA	4902400902	5	1	4	£1,500.00
0007769080	PCB SC51 BUS NCR TOWER	SPECRETAIL	515-0000263	3	2	1	£1,792.20
4950114101	PCB SC5T-6	S10	4950114101	8	0	8	£4,585.44
0007715812	PCB SENSOR	S10	7715812	5	0	5	£760.35
0007706009	PCB SEQUENCE LOGIC	S10	7706009	2	2	0	£103.36
0007720378	PCB SERVO	S10	7720378	4	1	3	£804.66
0007719483	PCB SERVO ELECTRONICS	S10	7719483	1	0	1	£119.13
0007819268	PCB SHELF INTERCONNECT DPN	SPECNETWK	QPA139	5	4	1	£1,789.70
0080056625	PCB SIMM MODULE 4MB	TITAN	80056625	7	5	2	£439.88
0007771472	PCB SPECIALEX I/O 4 *	SPECRETAIL	I/O4+POCL	1	0	1	£63.80
4901523941	PCB SQ	S10	4901523941	5	3	2	£469.00
0007813762	PCB SSAC15	VOICE OCS3	85UPB20012AAA	1	0	1	£280.58
0007769032	PCB STARLAN FOR NCR TOWER SYSTEM	SPECRETAIL	497-00008476	3	0	3	£1,050.00
0007771404	PCB STREAMER CONTROLLER	SPECRETAIL	348-0013804	4	4	0	£672.80
0007756646	PCB SUB	SW4	B17B-0690-0090A	15	6	9	£7,774.05
0007769496	PCB SYNC/ASYNC INPHASE	SPECRETAIL	INP0002	3	0	3	£870.00
0007763293	PCB SYNKARD 2780 COMMS	SPECRETAIL	278 SYNKARD	8	6	2	£1,439.76
4900224700	PCB TC2	S10	4900224700	1	0	1	£49.46
0007769494	PCB TCB TIL INPHASE	SPECRETAIL	INP0001-TCB	3	0	3	£450.00
0007707709	PCB TEMPERATURE COMPENSA	S10	7707709	4	2	2	£222.00
0007720756	PCB TIMING FENCE 101AL	S10	63002594-6001	11	11	0	£90.09
4901507301	PCB TMNA	S10	4901507301	10	2	8	£1,062.80
0007763283	PCB TOPAZ CARD (TANGOGATE)	SPECRETAIL	BRD016-MMB	2	0	2	£580.00
4902059002	PCB TRANSLATE (220V)	S25	4902059002	4	1	3	£1,481.24
0007769282	PCB TREE ACTIVE I/F FOR NCR 7052 WITH DISC	SPECRETAIL	497-0006405	2	1	1	£809.68
4901507601	PCB TSTA	S10	4901507601	2	0	2	£181.44
0007735801	PCB TVQM POWER AMP	SW3	B16B-9250-0010A	8	5	3	£1,844.32
0007767520	PCB TW1 MRU ASSY	WOLFCREEK	308636206	1	1	0	£1,169.86
0007767519	PCB TWP MRU ASSY	WOLFCREEK	308635205	4	3	1	£12,390.04
0007767527	PCB TWR PSU 5V DC MRU ASSY	WOLFCREEK	308637203	1	1	0	£991.63
0088836516	PCB UFIF 2 INTERFACE FOR ORION SCANNER	SCNRORION	88836516	19	13	6	£508.06
4901236147	PCB UNIVERSAL SERIAL I/O	S10	4901236147	2	0	2	£108.00
0007720356	PCB VIDEO AMP & CABLE	S10	63002668-4001	3	1	2	£265.41
0005154219	PCB W TRAY	S25	5154219	2	0	2	£420.32
0035210230	PCB W230 ASSY LARGE	S39 L30	35210230	5	2	3	£8,066.65
0035210232	PCB W232 LARGE	S39 L30	35210232	12	8	4	£13,640.88
0035210234	PCB W234 LARGEBOARD	S39 L80	35210234	8	3	5	£19,933.44
0035210242	PCB W242 16MB STORE MOTHERBOARD	S39 L35D	35210242	1	0	1	£1,283.51
0035210257	PCB W257 LARGE ASSY	S39	35908727	1	0	1	£1,438.62
0035210259	PCB W259 LARGEBOARD	S39 L80	35210259	3	3	0	£2,400.18
0035210353	PCB W353 LARGE PCB	S39 HSPC	35210353	15	10	5	£9,426.30
0035210953	PCB W953 LARGE PCB	S39 L30	35210953	6	6	0	£1,439.94
0035210954	PCB W954	S39	35210954	5	4	1	£5,125.00
0007719479	PCB WRITE ELECTRONICS	S10	7719479	1	0	1	£151.15
0034907208	PCB X017	S39 L30	34907208	5	0	5	£648.25
0034907209	PCB X018	S39 L30	34907209	1	0	1	£92.80
0034907212	PCB X019 FUNCT ASSY	S39 L30	34907212	4	0	4	£482.52

0034907213	PCB X020 FUNCT ASSY	S39 L30	34907213	5	1	4	£715 90
0034907217	PCB X021 FUNCT ASSY	S39 L30	34907217	5	1	4	£979 10
0034907215	PCB X022 FUNCT ASSY	S39 L30	34907215	15	7	8	£2,040 30
0034907244	PCB X040	S39 L80	34907244	6	5	1	£110 88
0034907246	PCB X041 FUNCTIONAL ASSY	S39 L30	34907246	16	9	7	£2,290 88
0034907251	PCB X042	S39 L80	34907251	2	1	1	£202 46
0034907250	PCB X043 FUNCTIONAL ASSY	S39 L30	34907250	4	4	0	£296 20
0034907254	PCB X044 FUNCT ASSY	S39 L30	34907254	6	0	6	£485 82
0034907255	PCB X045 FUNCT ASSY	S39 L30	34907255	2	0	2	£253 34
0034907256	PCB X046 FUNCT ASSY	S39 L30	34907256	1	0	1	£147 48
0034907257	PCB X047 FUNCT ASSY	S39 L30	34907257	8	0	8	£1,301 44
0034907274	PCB X053 ASSY	S39 L35	34907274	4	3	1	£838 68
0034907272	PCB X054	S38 L80	34907272	6	5	1	£1,752 18
0034907268	PCB X057 FUNCTIONAL ASSY	S39 L30	34907268	1	0	1	£157 25
0034907269	PCB X058 FUNCTIONAL ASSY	S39 L30	34907269	1	0	1	£117 90
0034907276	PCB X71 FUNCT ASSY	S39	34907276	9	2	7	£2,619 36
0034907278	PCB X72 FUNCT ASSY	S39	34907278	8	4	4	£1,366 72

Relay

7007057001	RELAY 12V	DATA CHECK	1018-007057-001	8	8	0	£15.92
0027560410	RELAY 26V 4C/O MIN PLUG IN VP4	2900	27560410	3	3	0	£9.00
0080009599	RELAY 2M 250V 7.5A	2903 TAPE	V23016/A0006/A202	2	2	0	£4.34
0005090845	RELAY 3-32V DC 1500 OHMS 10A AC	1900	D2410	3	2	1	£32.61
0080048595	RELAY 4POLE C/O	D20FPROLVL	80048595	2	2	0	£7.12
0007734956	RELAY DPST 240V	D40P MOD25	042PCA2242	2	2	0	£141.64
0007764957	RELAY MAIN DISCONNECT	D60 UPS SL	61709130	5	5	0	£368.40
0080048369	RELAY PLUG IN CS247	EDS 65 ADA	80048369	10	8	2	£24.60
0080005555	RELAY PLUG IN 2C/O 7.5A 4C/O 5A	2903 TAPE	R10-270	24	24	0	£107.76
0007727789	RELAY POWER	FDS 640	7727789	2	2	0	£20.52
0007755192	RELAY SOLID STATE	2900	31809D	9	9	0	£127.98
0007729820	RELAY SOLID STATE CDC 95689305	FDS 160	D4825	39	39	0	£546.78
0007708736	RELAY VOLTAGE	2900	7708736	1	0	1	£772.19

Disp2

0007723030	RELAY	LPS	265349	2	2	0	£8.72
0007822608	RELAY	NORTEL	NT887008	2	2	0	£2.18
0007815530	RELAY 12VDC NAT MATSUSHITA NF4-12V	MODMIAL	030420G	3	3	0	£13.29
0005090065	RELAY 24V	LPTR	5090065	4	4	0	£18.20
0007815533	RELAY 24VDC NAT MATSUSHITA NF2E-24V	MODMIAL	026034G	11	11	0	£46.53
0010690433	RELAY 24VDC NAT MATSUSHITA NF4E-24V	MODMIAL	690433	9	9	0	£47.07
0080003825	RELAY 2C/O 0.2A 24V	MARS DEFAU	V23012/A0105/A004	16	15	1	£82.56
0080019595	RELAY 5A 250V AC	MARS DEFAU	G2L13PV(24DC)	22	22	0	£47.74
0027560004	RELAY 90-280VAC INT.RECT NOA2410	ME29	31806X	2	2	0	£24.54
0007750103	RELAY ASSY	LPTR LP200	7505768	1	1	0	£18.57
0007750099	RELAY ASSY	LPTR LP200	7505767	1	1	0	£11.80
0007750100	RELAY ASSY	LPTR LP200	7511715	3	3	0	£77.64
0007757994	RELAY ASSY	NIP PP240	7511755	1	1	0	£7.09
0080049090	RELAY DIL 8PN	OPO WSTNUK	47W805T	55	55	0	£34.10
0007732793	RELAY IP IT 40A 32V SOLID STATE 750V PIV	MTU GTS	10078172	36	35	1	£388.80
0007730913	RELAY MAGNETIC 4PDT 24V	MICROPOLIS	T10-E2-Y4 VDC	5	5	0	£63.35
0005090155	RELAY OVERLOAD 1.6-2.4A	LPTR	T6-25500/GA	1	1	0	£25.13
0007735939	RELAY PSU	MTU MTS780	CS8L-0420-0005	6	0	6	£42.18
0080000571	RELAY REED 1A COIL 890OHM 12V	MT30 1ST T	80000571	20	20	0	£38.20
0080049379	RELAY REED 1POLE N/C ON/OFF	OPD WSTNUK	HE221B7081	1	1	0	£0.95
0080049377	RELAY SEALED 2POLE C/O	OPD WSTNUK	G4D287P-BT2-5V	10	10	0	£33.30
0007759216	RELAY SEALED DIL V23040	MODMIAL	346-659	2	2	0	£8.04
0005074626	RELAY SL 771336 24V DC	MARS DEFAU	5074626	4	4	0	£16.08
0007758220	RELAY SM1 PSU	MTU MTS780	B58L-0220-0001A	1	0	1	£12.04
0007751641	RELAY SOLID STATE	LPS 10	1204050	42	42	0	£373.38
0007751642	RELAY SOLID STATE -8134V1	LPS 10	1130951	3	2	1	£68.67
0007711942	RELAY START K2	KEY EDIT	KUP14A55	1	1	0	£9.63
0005012088	RELAY TYPE V 23154/B110 530 OHM	MARS DEFAU	5012088	12	12	0	£24.00

Disp3

0007768046	RELAY	PCNB NOTEB	DHX11D33208	18	18	0	£57.42
0007763091	RELAY CONTROL UPS 120V	PCT UPSM15	KUGP7A55-120V	15	15	0	£48.90
0007763090	RELAY CONTROL UPS 240V	PCT UPSM15	KUGP7A55-240	7	7	0	£51.38
0007765118	RELAY IN-RUSH	POWERVISIO	23383-00	1	0	1	£62.35

Disp4

4901583704	RELAY	S10	4901583704	2	2	0	£17.66
0007719765	RELAY 2P2T	SERVICE AI	2P2T R10-E1-W2-V185	4	4	0	£14.32
0080047892	RELAY V23016-A0002-A101	S25	V23016-A0002-A101	11	11	0	£33.22

Annex 2:

FUJITSU EUROPEAN ENVIRONMENTAL CONFERENCE

Business Conference Centre, Minutes of the General Discussion Session

20th November 1996

Attendees

Carl-Gustav Bilberg, Joy Boyce, James Carty, Dave Cassella, Gail Collins, Anita Eusala, George Hall*, Rauno Heinoonen, Val Hermaa*, Andrew Hicks, Hiroaki Higuchi, Jim Jeyan*, Shoji Kuragi, M. Kurebayashi, Juan Lopez, Miguel Merino, S. Mitrew, Roger Murphy, K. Nakayama, Kevin Ogino, Thomas Ritter, Mike Sewart, Jeff Thompson, Viki Turner & Laurie Wood.

* Indicates delegate was not present during discussion session.

Facilitator: Joy Boyce

Report Number 1

Minutes

Annex 2

Joy Boyce raised the following issues for discussion:

1. Frequency of co-operation meetings
2. Who will be responsible for organising the next Fujitsu European Environmental Conference and its venue
3. Packaging and the need for co-operation
4. Fujitsu's Environmental Principles
5. Cooperation and the way forward
6. Fujitsu environmental logo

Annex 2:

FUJITSU EUROPEAN ENVIRONMENTAL CONFERENCE

Beaumont Conference Centre, Minutes of the General Discussion Session

20th November 1996

Attendees

Carl-Gustav Biberg, Joy Boyce, James Carty, Dave Cassells, Gail Collins, Anita Enssle, George Hall*, Rauno Heinonen, Val Herman*, Andrew Hicks, Hiroaki Higuchi, Jim Jeyam*, Shouji Kunugi, M. Kurebayashi, Juan Lopez, Miguel Merino, R. Mitten, Roger Murphy, K. Nakayama, Kevin Ogino, Thomas Ritter, Mike Stewart, Jeff Thompson, Vicki Turner & Laurie Wood.

*** indicates delegate was not present during discussion session.**

Facilitator: Joy Boyce

Minutes

Joy Boyce raised the following items for discussion:

1. Frequency of co-operation meetings
2. Who will be responsible for organising the next Fujitsu European Environmental Conference and its venue.
3. Packaging and the need for co-operation
4. Fujitsu's Environmental Principles
5. Cooperation and the way forward
6. Fujitsu environmental logo

Frequency of meetings

It was suggested that the meetings should be more regular so that specific problem areas could be discussed. But the meeting also expressed concern about the time gap between this conference and the next scheduled European conference in November 1998, in the light of the importance conference delegates attached to meeting as a discrete group.

Vicki Turner suggested the possibility of a general meeting (or conference) which could feed down into smaller group meetings for more specific issues.

Joy recapped what had already been expressed and offered a way forward as being the idea of implementing a two tier system - annual or biannual conferences for all Fujitsu affiliates in Europe coupled with meetings on a specific topic or group of topics to which all would be invited but could attend as they felt necessary.

Conference delegates agreed with this suggestion. They also emphasised the importance of the integration of individual experience on specific issues.

Vicki suggested that all companies could present on an annual basis to the European group on their Environmental Management System, their environmental structures and their progress. Out of this would arise issues such as packaging or software which could be put forward for discussion at more local meetings.

Joy summarised by putting forward:

- 1.1 An Annual Meeting - as a structured conference
- 1.2 Local Meetings - frequently (as required) and on specific issues

Host for the next Annual Conference

Roger Murphy asked that the conference should set a date, and decide upon the host and venue for the meetings. Rauno Heinonen nominated Germany to host the next annual meeting. Vicki Turner offered the facilities at Newton Aycliffe, County Durham and said they would offer to host the next annual conference. It was decided that the final decision would be made at the discussion session on 21.11.96, before the conference adjourned.

Cooperation and Way Forward

Dave Cassell described a need for central databases on environmental information such as environmental legislation and hazardous chemicals.

Joy described the ICL Intranet for information availability. She then went on to suggest the possibility of setting up a Fujitsu Intranet which would be available to those at the conference and also similarly minded people.

The following publications were also mentioned as sources of information:

Croners - Environmental Management, Hazardous Substances, Agra Europe
European Environmental Law for Industry

Dave emphasised the need for information to enable independence from external consultants and mentioned an example of an expertise database on environmental chemistry. Joy pointed out the need to conserve resources and the time consuming activity of inputting and up-keeping data on such a database.

It was pointed out that requirements on products should be available and that there should be provision for answers to questions regarding these requirements.

Joy suggested an on line conference system in order to exchange views in ongoing debates, ask questions and receive answers to those questions, and obtain information. Joy offered that she and Gail Collins would be responsible for setting up such an on line conference facility.

Mr. Higuchi offered the use of Fujitsu's home page facility. Joy explained that an on line conference would simply be a messaging dialogue system that would be faster than a web site home page system. She went on to say that the home page facility would be useful to set up as a follow up - with perhaps not too many full colour graphics which are time consuming to down-load!

Vicki drew attention to the beneficial option to cooperate towards economic solutions and that this could be developed by setting up the working groups on particular issues.

Fujitsu Emblem

Joy pointed out that it was not only the words that did not translate well into the UK environment, but that the logo was very similar to the "Acid House" drugs related logo used in the UK and other parts of Europe.

It was commented that the wording of the longer version 'we look after our earth forever' was a little "over-the-top" when translated into English.

Joy suggested that the wording of the shorter version, 'we care for our earth' provided a clearer message.

21st November 1996

Attendees

Tony Adderley, Carl-Gustav Biberg, Joy Boyce, James Carty, Dave Cassells, Gail Collins, Len Davies, Anita Enssle, Val Herman*, Andrew Hicks*, Hiroaki Higuchi, Jim Jeyam, Shouji Kunugi, M. Kurebayashi, Juan Lopez, Miguel Merino, R. Mitten, Roger Murphy, K. Nakayama, Kevin Ogino, Thomas Ritter, Mike Stewart, Jeff Thompson, Vicki Turner & Laurie Wood.

Minutes

Mr. Higuchi stated that he hoped we could continue to work successfully for environmental issues and thanked Joy for coordinating a productive meeting.

Joy Boyce queried whether there was a range of issues for addition to an on line conference board, such as Environmental Management Systems (EMS).

Mr. Merino stated that access to other FJ companies' EMS documentation and manuals would speed up certification for those who were still working towards ISO14001 or similar.

Joy expressed concern that this might create a false sense of security which could prevent people from thoroughly thinking things through as they prepare their own documentation, and also that apart from the Register of Legislation if you were operating in the same country, each company's documentation would be very different, as we all operate different plants etc.

Dave Cassells pointed out that the register of regulations is useful in such a scenario but would obviously not be of use to Spain because legislation there would be different. Mr. Merino said that the main body of the manuals could be very profitable and they would only need to be adapted to their needs.

Dave stated that the Environmental Review Report and the Evaluation of Effects would be useful, but FTEL's EMS has been based on their quality systems. He suggested that it would be preferable for information to be related selectively, otherwise it would become confusing for them. Dave also said that it would be good for them perhaps to be able to look at the method of formatting to enable them to formulate their own.

Guest Speaker: Jon Andrews, said that EMS are very different to those pertaining to Quality because they deal with the geology of the plant etc. and are specific to the set of geographic and topographical situations each company is confronted with.

He stated that often it is the individual personalities within a company or site working towards certification that are the strength.

Mr. Merino reaffirmed their need for knowledge of how it works and gave examples of queries such as how D2D is organising itself for energy saving etc. He said that it would be helpful to them and to other companies.

Jon stated that the development of a system for certification is very different to that for performance. The result of the differences being that documents tend to create a hindrance rather than enhancement of performance. Tony Adderley stated the differences between the D2D sites at Kidsgrove and Byley and those between ISO14001 and EMAS. He said that even though Kidsgrove and Byley were part of the same company, it had not been useful to them to examine in detail Kidsgrove's documentation. He said that Byley had looked only at the mission statement / policy statement for Kidsgrove. He explained that there is no easy route by copying and that people have got to read things through thoroughly and fully understand it. Jon stressed the importance of the experience of staff involved in Health and Safety and Risk Assessment when preparing EMS documentation.

Joy commented on the extensive work funded by the European Commission on how and if companies were linking environmental improvements into their financial monitoring and reporting. There have been two studies carried out for which she had been interviewed where it had been apparent that ICL does not link environmental costs into financial procedures and reporting or year end statements, but that the interviewers had been up front about the fact that this was also the case for many other companies. It was inherent in some of the legislative issues that this could eventually be linked into the development of environmental legislation. This was an issue that should be considered to be important for future attention.

Joy asked if it was the wish of conference that the Fujitsu European Conference should be held annually and that local meetings should be held twice a year or more if burning issues arose. Conference decided that it would like to hold its main meeting as an annual conference, and that local or Europe wide meetings should be held twice or more per annum on a specific topic, as members felt was necessary.

Joy asked Mr. Higuchi to let her know the date for the 1997 Fujitsu Global Environmental Conference in order that there was no clash between the two. There was some discussion as to whether the annual conference should be held in June 1997, but Conference

decided that a September Annual Conference could feed into the November Global Conference. The date for the next Annual European Environmental Conference was set for September 1997 and agreed to be held at Newton Aycliffe, County Durham.

Actions

Joy Boyce and Gail Collins - on-line conference facility

Mr. Higuchi - date of 1997 Fujitsu Global Environmental Conference

Vicki Turner - date of September 1997 Fujitsu European Environmental Conference

Gail Collins, Dec. 1996

Report Number 1

Annex 3

Annex 3:

Energy Report

Introduction

ICL has signed a declaration of commitment for energy efficiency under the UK Governments 'Making a Corporate Commitment Campaign'. The campaign seeks board level commitment to energy efficiency in the private and public sectors. Senior management are encouraged to treat energy efficiency as a high priority by giving a board level Director responsibility for developing an energy efficiency strategy and ensuring that it is an item that is considered regularly at board level. The central feature of the campaign is the signing - by the Chairman or Chief Executive - of a voluntary Declaration of Commitment. The declaration states the essential management issues necessary for an effective energy policy, as follows:-

- Publish a Corporate Policy
- Establish an Energy Management Responsibility Structure
- Monitor and Evaluate Performance Levels
- Set Performance Improvement Targets
- Increase Awareness of Energy Efficiency Among Employees
- Hold Regular Reviews

- Report Performance Changes and Improvements to Employees and Shareholders

ICL has produced an Environmental Policy Statement which states that it will 'establish a comprehensive energy efficiency programme with a rigorous on-going plan for the reduction of energy consumption'. Within ICL's set of published environmental targets it has stated its commitment to energy management and that it aims to reduce its energy consumption by 3% during 1994/97 (Appendix 1, written by Joy Boyce).

The benefits to the business and the environment resulting from a reduction in energy consumption are increased profits, lower production and maintenance costs, and a reduction in ICL's environmental impact.

Data is collected on energy consumption from all ICL UK sites on a quarterly basis. The site facility managers for each site send these figures in along with other environmental information (Appendix 2). This environmental management system was set up for the purposes of raising awareness of environmental issues and responsibilities, monitoring progress and the production of ICL's first Corporate Environmental Report.

Mailshots were sent out to raise awareness and impress the importance of reducing energy consumption. These communications relating to energy efficiency were often informative of technologies or sources of help. As examples information was sent out regarding the workshops run by The Department of the Environment on both energy efficiency and waste management; and details of Ecoflow technology as a method of reducing fuel consumption (Appendix 3). In order to assess the progress of site facility managers with respect to increasing energy efficiencies on their sites a questionnaire was designed and sent out to them (Appendix 4, written by Joy Boyce). The results of these surveys were collated, summarised and distributed to provide feedback (Appendix 5).

Discussion and Conclusions

The results of the questionnaire showed that there were in fact many good projects going on at many of the sites and distributing this information was hopefully beneficial in terms of encouragement and motivation. Unfortunately, the site facility managers did not comment/ feedback on the summary table document sent to them. Many of the site facility managers expressed an interest in attending the DofE workshops though, and the environmental affairs department encouraged and aided them to attend.

Ideas have developed as to the next step possibly being to organise internal workshops between the site facility managers themselves as an opportunity for sharing experiences, information and ideas. This needs to be followed up and details of resources explored with possible links into energy expenditure. For this the purchasing officer needs to be contacted in order to gain a sanity check on the energy data collected and to gain a financial angle.

There is still some energy consumption data being collected to close 1996 and this will hopefully enable an assessment of progress to date and will be a pointer as to what further efforts are needed to reach the ICL target of 3% by the end of 1997.

Annex 3

Appendix 1

ICL's Corporate Environmental Policy Statement and Targets

By Joy Boyce

CORPORATE ENVIRONMENTAL POLICY

ICL is dedicated to the protection of all components of the environment which might be affected by its activities, and to the compliance with, and anticipation of, environmental legislation.

ICL Board members are committed to ensuring that our environmental policy is understood and implemented at every level of the organisation. ICL is committed to training and informing its staff on environmental matters. Our people are empowered to take individual actions to reduce the company's impact on the environment.

ICL will have measurable targets against which we can monitor our environmental performance. We will communicate throughout the ICL group of companies and externally our performance against the targets.

ICL will continue to work to minimise the effects of its operations and products on the environment through a process of continual improvement in our design, manufacturing and end-of-product-life processes, and will also adhere to environmental standards and legislation. We will remember the impact of our products on people - our products will exceed ergonomic standards.

ICL will introduce programmes for the recycling of products and waste, and is committed to reducing energy consumption in its products and operations.

ICL works with its suppliers to ensure that they in turn give thought and consideration to the impact of their processes and products on the environment. We also work closely with our customers to identify ways in which together we can improve awareness of, and impact on, the environment.

In particular we will monitor all parts of our business against these specific goals:

- * Design our products with a view to their eventual disassembly and their energy consumption, emission levels and ergonomic efficiency.
- * Aim to minimise the use of all materials, supplies and energy in our manufacturing operations, and, wherever possible, use renewable or recyclable materials and components and reduce levels of, or eliminate, any harmful emissions.
- * Promote the use of recycled materials where possible throughout our operations, initiate recycling programmes, and encourage re-use and refurbishment.
- * Minimise waste produced in all parts of the business and aim for continual waste reduction.
- * Expect similar environmental standards to our own from all third parties involved with our business - suppliers, vendors and contractors.
- * Assess on a continuous basis the environmental impact of our operations, and adopt an environmentally sound transport and logistics strategy.
- * Establish a comprehensive energy efficiency programme with a rigorous on-going plan for the reduction of energy consumption.
- * Support a comprehensive self-auditing environmental process throughout the organisation with our own targets and national, European and international standards as its benchmarks.
- * Encourage our staff in environmental initiatives and support them with training and awareness programmes on environmental issues.
- * Assist in developing solutions to environmental problems and support the development of public policy, and national, European and international legislation.

CORPORATE ENVIRONMENTAL TARGETS

1994/97 TARGETS

A. LIFE CYCLE OF PRODUCT

Design

ICL has already begun to design its products for disassembly, for low energy consumption, in the use of recycled plastics, and in using materials and components which are environmentally conscious. Its efforts in this area are most advanced in its PC and mainframe computer product ranges. ICL will extend its efforts for environmentally credible design to all of its products.

1994/97 Targets

ICL will continue to design its products for disassembly. New products will be designed to include maximum use of clip-on parts, standardisation of screws and the marking of plastics.

ICL will, where practicable, maximise the use of recycled plastics in new PC, terminal and mid range products which are in the design stage. In addition, ICL will look at increasing the use of recycled plastics in its specialist products for the retail and financial services markets.

ICL will, where practicable, design new products to include lithium batteries, condensers free from cadmium and poly-chloro-biphenols and will not use flame retardants nor sprayed EMI-shield coating on plastic housing.

ICL has already incorporated software which reduces energy consumption during operation in its latest range of PCs and has a mainframe range of computers with one of the lowest energy needs. It will seek to extend low energy consumption throughout its products.

1994/97 Target

ICL will, where possible, seek to design new products with increased processing power with the same or lower energy consumption, where this is applicable.

Distribution and Packaging

ICL's packaging materials and methods already meet the minimum required standards in all the countries in which it operates.

1994/97 Targets

ICL will, where practicable, offer to remove all hardware packaging on delivery, and, where condition of the material permits, will recycle or reuse it.

At present a significant percentage of ICL packaging is manufactured from recycled materials. ICL will seek to increase this proportion by 5%. ICL will continue to design its packaging for disassembly, thus ensuring more effective recycling and re-use of packaging.

In many of its operations, ICL products are received, stored and distributed on re-useable pallets. ICL will seek to increase its use of re-usable pallets by 5%.

Where feasible, ICL will work with its suppliers to identify which components can be shipped with the minimum amount of packaging, and to implement this reduction in packaging.

ICL already distributes a large proportion of its software and documentation electronically or in bulk on CD-ROM. ICL will aim to increase the amount of software and documentation distributed in this way by 50%, making a significant saving in paper, printing, packaging and transport.

End-of-Life

ICL has recycling centres throughout Europe including Denmark, France, Sweden, the Netherlands, Finland and UK where, at its Byley, Cheshire centre it refurbishes and recycles equipment from the UK and provides product for ICL's Worldwide Spares operation.

1994/97 Targets

Where legal requirements exist, ICL will take back end-of-life equipment for recycling, reuse or refurbishing. Where such requirements do not exist, ICL will offer to take back end-of-life equipment for recycling, reuse or refurbishing.

During 1994/97 ICL will seek to decrease by 1% overall of the total returns the amount of equipment which is committed to landfill by improving its recycling and refurbishing processes at Byley. This is dependent upon a similar mix of equipment being returned to Byley.

ICL will work with its operating companies to obtain statistical information on the amount of used equipment which is recycled in its European operating companies.

ICL will ensure that all recycling organisations with whom it works follow best practice. During 1994/97 we will plan to audit them on an on-going basis and will begin the auditing process.

ICL will ensure that end-of-life equipment returned to its operating companies will be inspected and refurbished and used for spares.

B. ACCREDITATION AND AUDITING

ICL has pioneered a policy of conformance to standards in the IT industry, both technological standards like open systems, and business standards such as ISO 9000. ICL will extend this policy to the management and continuous improvement of environmental issues.

1994/97 Targets

ICL will seek accreditation for the appropriate national, European and international environmental management standards. ICL will implement a programme of internal environmental audits at three key UK sites during 1994/97. The process of preparing for internal auditing will also begin at selected European sites. In addition, external auditing will be carried out at two key UK manufacturing sites.

C. ICL'S SUPPLIERS

ICL has an accredited vendor scheme which has been in operation for some years. In the past ICL has encouraged and supported its vendors during their registration for BS5750, the Total Quality Management standard.

1994/97 Target

ICL will expect its accredited vendors to apply or be planning to apply for the appropriate environmental standards and consideration will be given to this in every purchase made by the Company. We will continue the dialogue with our suppliers concerning their own environmental policies.

D. ENERGY EFFICIENCY

ICL is a signatory of the Energy Efficiency Office's Declaration of Commitment which commits the Company to responsible energy management. ICL has energy management systems in operation at many sites throughout the UK.

1994/97 Targets

ICL will put in place all of the actions required by the Energy Efficiency Office's Declaration of Commitment.

ICL will aim to reduce its energy consumption offices by 3% during 1994/97.

E. TRANSPORT AND COMMUNICATIONS

ICL already has a logistics policy which involves using the most environmentally conscious methods of moving product around the world. Its car fleet policy includes the mandatory use of unleaded petrol for all company cars and encourages the use of catalytic converters, diesel fuels and liquefied petroleum gas (LPG) engines.

ICL has long experience of using technology to help safeguard the environment. Since 1984, ICL has been building its own internal electronic mail network, thus reducing consumption of paper and energy for transportation. Today it operates one of the world's largest X.400 networks providing a range of services to support the company's business communications needs.

ICL estimates that its video conferencing network saves the company more than one million passenger kilometres per year. The network comprises some 20 plus video conferencing studios in the UK, mainland Europe, North America and Japan. ICL has also pioneered the use of telecommuting to reduce the amount of employee miles travelled each year.

1994/97 Targets

During 1994/97 ICL will increase the number of vehicles in its worldwide fleet which are fitted with catalytic convertors, and will also increase the number of diesel vehicles in the fleet.

During 1994/97 ICL will seek to increase its use of video conferencing facilities by 20%.

F. ELIMINATION OF WASTE

ICL has already put in place waste elimination systems at many of its manufacturing plants and is monitoring waste at these plants and at its administration sites. It plans to extend both the formal systems and the monitoring activities.

1994/97 Targets

During 1994/97 ICL aims to reduce its use of virgin paper by 2%, and will encourage the increased use of recycled paper.

ICL's manufacturing operations in the UK and Europe will seek to reduce their water consumption by 5% during 1994/97.

G. RECYCLING OF CONSUMABLES

In many ICL sites throughout the world, with the support and co-operation of management, ICL staff have set up their own recycling schemes for used paper, cardboard, bottles, plastic cups, aluminium cans, batteries and office equipment consumables. Many sites have won local environmental awards and have also taken action to protect the local natural environment. In formally monitoring these activities, ICL will also seek to encourage staff initiatives and enthusiasm for environmental protection.

1994/97 Targets

ICL will aim to increase the amount of virgin paper and cardboard it recycles by 2%.

Most ICL sites throughout Europe now have plastic cup recycling schemes in place. In 1994/97 ICL will aim to recycle 30% of all plastic cups used in the UK and mainland Europe.

A formal process for recycling laser printer consumables has been in operation in the UK and Europe for some time. In 1994/97 ICL will seek to increase the number of laser printer units recycled by 5% and will also make this scheme available to its customers in the UK.

H. TRAINING AND AWARENESS

ICL has an excellent record for training both its own staff and its customers and holds a UK Government "Investing in People Award". ICL's training activities will be extended to include environmental management and awareness.

1994/97 Targets

Early in 1994 we formally launched our Corporate Environmental Policy to our staff, our suppliers and our customers. During 1994/97 ICL aims to extend its environmental staff training programme to reach all staff throughout Europe and will also introduce staff environmental action awards.

We will also introduce a supplier awareness pack which will aim to support suppliers who are registering for the appropriate environmental management standards, and we will also offer practical advice and guidance to suppliers.

ICL will support schemes to promote staff community action for the environment and will also encourage individual initiatives.

ends

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Appendix 2

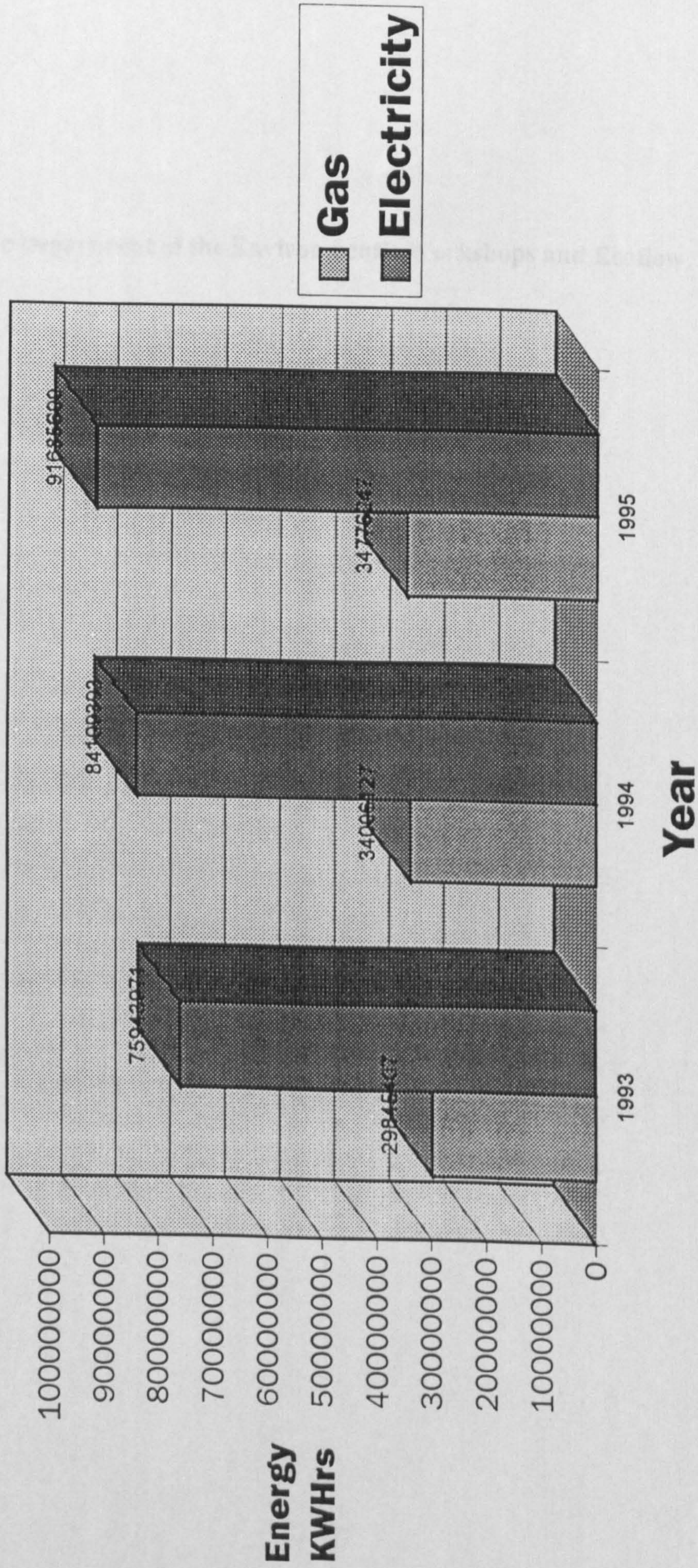
ICL's Energy Consumption Data

Figures from site facility managers
(UDAP Condensed)

Oil in Litres
Gas and Electricity in KWHours

Site	1993			1994			1995		
	Oil	Gas	Elect	Oil	Gas	Elect	Oil	Gas	Elec
BIR03						1392365			1428097
BRA01		52450	3055570		38132	1228587		811549	6469117
BRS06		355253	850420		412222	862460			
BSN01		47670	4171270		39196	4277613		30220	4162370
ELS01		542535	157081		874323	96276		405597	80629
FCY03		647919	245491		502404	267452		286270	672980
FEL01	115000	227807	10933874	92000	169153	11237795	75000	211854	11468233
FEL03					71571	1143585		99208	783324
KID01		18104055	23319568	10000	19190205	23984232		19700711	25111268
LON11	85000			75000			72800		273406
MAN01									
MAN05		5295229	21665945		5727824	21545911		5096216	23181912
MAN12			2600000			2140000			1760939
NEW05			450679			542766			477145
REA08					1329045	9080		1285309	8342
SLH01					11180	112943		369096	120702
SLH06		32859	3509620		42007	2219910		391306	4338118
STE04						8809554	30000	158454	6757388
TAP01	28200	835628	383120	20000	823476	371978		827416	1017762
TECH01		109867	761254		870324	794337		1341297	797147
WAK01			1057706			464051			363161
WIN01		46704	2416220		36728	2239900		30874	2065340
WSR01		3547431	366153		3868337	368598		3730870	348319
Total	228200	29845407	75943971	197000	34006127	84109393	177800	34776247	91685699
oil: '93 2	94 3	95 3		Oil:	Rate 94/93	-14%	Oil:	Rate 95/94	-10%
elec.: '93 16	94 21	95 21		Gas :	Rate 94/93	14%	Gas :	Rate 95/94	2%
gas: '93 13	94 16	95 16		Elec:	Rate 94/93	11%	Elec:	Rate 95/94	9%

Energy Consumption



Annex 3

Appendix 3

Mailshots of the Department of the Environment's Workshops and Ecoflow Technology

ENERGY MANAGEMENT EVENTS

Events are run externally on energy management issues. The wide range of skills and know how involved in these areas are covered by the variety of workshops available.

The energy seminars available are run on behalf of the Department of the Environment's Energy Efficiency Best Practice programme by ETSU and BRECSU (Building Research Energy Conservation Support Unit).

The free service provided can enable businesses to come in line with ICL company policy as well as improve efficiency, saving time and money.

Energy Management Events

BRECSU

Practical Energy Management, for buildings
Corporate Energy Management - a strategic approach
Marketing Energy Efficiency - raising staff awareness
Energy and Environmental Reporting and Accounting for Financial Managers
Practical Energy Management, for buildings

ETSU

The Energy Management Maze
Managing Information Systems, for Industry
Putting Energy into Quality Programmes, for Industry
Putting Enthusiasm into Energy, for Industry

If you are interested in any of the above events ETSU can be contacted on Tel: 01235-432923 and BRECSU on 01923-664787

Please let myself or Alison Hughes know if you intend to pursue this.

Kind Regards
Gail Collins
Environmental Affairs
Lon11
Tel: 7221-2559
Fax: 7221-6671

ECOFLOW - REDUCE YOUR FUEL COSTS AND EMISSIONS

Ecoflow provides a simple solution to reducing fuel consumption, reducing emissions and providing a cleaner combustion. It is a small capital cost with a speedy payback period.

Ecoflow works on the basis of Ionisation by Magnetic Induction (IMI). Magnetism is a source of natural power and recent developments have enabled more of this power to be harnessed as alternative energy. Energy is a transfer of power resulting from atomic change. The unique field of Ecoflow generates a massive flux density of 140mT, sufficient to change the atomic structure of the fuel leading to a more efficient transfer of energy.

Ecoflow units are strapped onto the fuel pipe carrying fuel, gas or oil. If fitted to new appliances that are running at maximum efficiency anyway, it will help maintain this efficiency by keeping the combustion area clean. It will not invalidate the manufacturers warranty as it is not a 'material change'. Benefits are not seen immediately, it takes about two to three weeks for heating equipment.

This technology has been adapted for different applications such as petrol/ diesel vehicles, water pipes for reduction of limescale build up (called H2flow), beer pipes - reducing the need for cleaning so often, and even for health benefits (called bioflow).

The more efficient combustion of the fuel should also result in less harmful gases. By experience, an ICL site has found 13% savings on gas consumption by fitting Ecoflow units on gas boilers (reduction in emissions should be up to 30%).

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Appendix 4

Energy Efficiency Questionnaire

By Joy Boyce

QUESTIONNAIRE ON ENERGY EFFICIENCY

The ICL Group is a signatory to "The Making a Corporate Commitment Campaign" (MACC), part of the Government's strategy to reduce energy consumption and, therefore, the emissions of carbon dioxide (CO2) to the atmosphere.

The ICL Group currently spends £7m-£8m per annum in the UK alone on electricity, gas and oil, so reductions in energy consumption are important to us, not only for environmental reasons but also for good business practice and use of our resources.

The Department of the Environment is now requiring us to account for our performance as signatories to MACC. We therefore need your co-operation to complete our detailed report to the Government.

Please could you take a little time to give us the following information - approximate figures are acceptable and please detail every initiative taken, however small and insignificant it may seem to you.

NAME.

JOB TITLE

SITE/BUSINESS
(if Business, please indicate which sites/parts of sites this covers)

1. Has your energy consumption increased, decreased or remained the same during the past year (i.e., in 1995)? Please tick as appropriate.

increased.....decreased.....stayed the same.....

2. What measures have been taken at your site/in your business to increase energy efficiency (decrease consumption) over the past year? Some examples are given below. Please tick as appropriate and please also give an approximate indication of investments required for each improvement and also, if possible, indicate the financial savings achieved. If measures were taken in 1994 or before please also indicate these, and include date of implementation.

Installation of energy efficient lighting

.....
.....

Installation of energy efficient heating

.....
.....

- Installation of new heating system
.....
- Installation of new boiler
.....
- Improvement to heating system
.....
- Updating of other equipment to be more energy efficient, please specify type of equipment
.....
.....
- Improvements to insulation
.....
- Increasing staff awareness.....
.....
- Changing the type of fuel used
.....
- Improved controls, eg timers, pump controls for water/fuel.....
.....
- Recycling/use of surplus heat/energy, steam, heat recovery
.....
.....
- Setting up energy/fuel management systems.....
.....
- Continual monitoring of energy usage.....
.....
- Metering of utilities.....

Installation of PCs with Power Management software (some ErgoPro models) or Energy Star PCs

.....
.....

3. Does your site/group of sites house less staff than it/they did a year ago?.....

4. If yes, has this accounted for a reduction in energy consumption?

5. Do you calculate energy consumption at your site/group of sites on a per capita basis?.....

6. If yes, what is it?

7. Do you intend to implement any measures to increase energy efficiency over the next year? If so, please outline below what they are and what savings you anticipate making.

.....
.....

8. If you are not intending to take any measures during the next year, could you please give the reasons why not. (e.g., no investment earmarked, lease coming to an end)

.....
.....

9. Would you like Corporate Environmental Affairs to organise a Energy Efficiency workshop at your site/group of sites/for your business at no charge?

10. Who is responsible for energy management at your site/in your business?

.....

Many thanks for your co-operation in giving us this information. Please respond via e-mail, fax or hard copy. If you want to discuss the questions or any aspects of energy management, please call or e-mail us.

Corporate Environmental Affairs Unit, LON11

Telephone: 7221 2788, 7221 3179 Fax: 7221 6671

ref: jgb/energy/qustnnaire

Annex 3

Appendix 5

Energy Efficiency Questionnaire Results Summary Table

Energy Efficiency Survey Summary

The responses from the site facility managers for the ICL UK sites are as follows:

Site Code Site Facility Manager	Heating and Lighting	Staff Awareness Campaigns Power Management Software Fuel Management systems	Metering Energy Trends
Bir03 L. Broxton	Installed energy efficient lighting in 1992. Contract with managing agent for heating (gas), savings in heating becomes their profit as incentive for reduction in use. Insulation has been considered but the cost would not be justifiable for the length of the lease.	Energy saving stickers attached to all kit some years ago.	Valves fitted on central heating on four wings. Utilities are metered. Energy consumption has increased. No increase in staff.
Bir03 Annex L. Broxton	Energy efficient lighting installed in 1992. Installed a new boiler in 1993.	None	Utilities are metered. Energy consumption has decreased. Reduction of staff accounts for reduction in energy use. As a measure to reduce consumption, the fourth floor is being closed.
Bir04 L. Broxton	No changes Plans to look at insulation this year.	None Water meter installed.	Utilities are metered. Energy consumption has increased, as have the numbers of staff.
Tel02 - Enterprise Government L. Broxton	No changes	None	Utilities are metered Energy consumption increased. Number of staff same.
Brs06 P. Holmes	PLC Energy saving lamps fitted to areas where BC and ES filament lamps were installed. Gas Boilers (3) are fitted with Therm saver Energy Saving Devices	Flow restrictor valves fitted on toilet hot/ cold water taps. Hot water temperature monitored, calorifier stats adjusted to give legal required temp. Gents urinals flushing system fitted with flow-matic water saving devices.	All utilities are metered on a monthly basis. Staff awareness drive on all aspects of energy saving to be set up.

Site Code Site Facility Manager	Heating and Lighting	Staff Awareness Campaigns Power Management Software Fuel Management systems	Metering Energy Trends
Bsn01 Peter Bolus	No installation of energy efficient lighting or heating because the finance was too extended. Gas boilers have been fitted with Ecoflow 3 units, showing an initial result of 16 - 18% savings on gas consumption. Various options are being considered for energy reduction next year.	Staff are made aware Some PCs with Power Management software have been installed.	Improvements in supervision of controls. Regular consultation with on site engineer for monitoring of energy usage. Utilities are metered. Energy use has decreased. The numbers of staff have decreased but does not entirely account for the reduction in energy consumption.
Fcy03 M. Thompson Halcyon AC-contractor	New building, 18mnths operational 19 hrs/ day lighting high density. Timers on heating/AC systems- modern modular boilers with electronic control systems. New heating system. 3 new boilers. Fully insulated. All controls fully electronic. No heat recovery plant is installed	Energy consumption is monitored on a regular basis and comparisons made with previous readings. Some PCs are Ergo-Pro.	Metered on weekly basis. Energy consumption has increased. Staff numbers have increased. Difficult to implement savings unless plant running time is decreased - not a likely option. Modern building- little room for improvement.
Fel01 Jerry Williams	Category 2 lighting has been installed in part 'C2' block. New heating/ Air conditioning system has been installed to 'D' block during 1994. Chemical flushing of heating pipes by descaling calorifiers. Improvements have been made to insulation	Staff awareness increased. Fuel management system installed to control boiler firing in 1993. Some ErgoPro models.	Utilities are metered. Increased energy use split due to increased number of meters. Electricity consumption has increased by 1.4% Oil use has decreased by 14.8% and Gas by 4.2%. Increase in number of staff. Plans in progress for installation of energy saving devices.
Kid01 P. Reeve, G. Mellor, Site Services	No energy efficient lighting installed. Trend Control System energy efficient heating installed. Energy management systems installed in 1989. Insulation by lagging some steam mains.	Poster campaign, Green kids Quality Circle.	Utilities are metered. Decreased energy consumption.

Site Code Site Facility Manager	Heating and Lighting	Staff Awareness Campaigns Power Management Software Fuel Management systems	Metering Energy Trends
Kid02/ Mid01 P. Townsend, Engineering manager	No energy efficient lighting or heating has been installed. Proposal to install Air conditioning and assessing lighting requirements. Quotes received for new boiler. Double skin roof installed in 1989.	Awaiting information from BRESCU and EEO before launching EE campaign.	Digital Timers installed in 1993. Utilities metered. Decreased energy consumption, accounted for by reduction in staff.
Man01 Denis Johnson	Energy efficient lighting installed in 1995. Trend Control System fitted in 1989. Air compressor installed in 1995, CAT 2 lighting, PLC Control of production lines. 'Fast Door' on Stores, all 1995	Environmental displays in main entrance to factory. Energy/ fuel management system in place. Plans to install energy efficient boiler burners, £5K. Weekend shutdown, £10K.	Energy metered hourly, other utilities metered daily. Trend Control fully exploited. Energy use has decreased. Number of staff the same.
Man05 D.L.Hall	Energy efficient lighting has been installed. High frequency and VDU reflectors fitted. 430 Thorn sensor fittings were installed - 50% power reduction. High efficiency boilers fitted increasing heating capability by 50%. Replaced boiler flue dilution system with insulated s/steel flue - reduced losses by 10%. Improvements to insulation by 60%, roof of main building redone, reduced heat gains to computer halls and chiller load.	Installed energy management system reducing electricity consumption by 8% and gas consumption by 30% and has enabled increased savings by controlling pumps on outside temperature. Various poster/ email campaigns to switch off PC's, printers, lights etc. Heat recovery fitted to chillers to reclaim heat from refrigerant for domestic hot water for half the site. Approx. 300 PC's out of 1100 have some form of power mgt. Installation of constant hot water boilers and removal of personal kettles.	Energy consumption has decreased. Timers/ light sensors fitted to outside lights, and restaurant lights. Installed fan and extract speed controllers. All fans, extracts and pumps have been specified with high efficiency induction motors. Energy monitored and metered. Staff numbers have not decreased. Plans to install condensing boiler to heat restaurant, carry out pipework mods in 1996. In 1997 replace 16 off modular boilers with upto 4 off condensing boilers.

Site Code Site Facility Manager	Heating and Lighting	Staff Awareness Campaigns Power Management Software Fuel Management systems	Metering Energy Trends
Man12 J. Schofield	Individual light switches fitted in all offices. Cost £1800, saved £2100p.a.	Labeling light switches	Continuously monitoring energy usage. Utilities are metered. Energy consumption decreased, accounted for by decrease in number of staff. Will reorganise occupied areas to minimise costs.
New05 E. Kerry	No energy efficient heating or lighting has been installed.	Staff awareness has increased - ongoing	Continuously monitoring energy use. Energy use has stayed the same. Reduction in numbers of staff.
Rea21 WVB Jardine	No energy efficient heating or lighting has been installed.	Staff are made aware to switch off at end of day. Set air conditioning to minimum required. Some PCs with Power Management software.	Continuously monitoring energy use and air conditioning from season to season. Utilities are metered. Energy consumption has remained the same. No future plans as tenancy is under review.
Ste04/10/14/09 Dave Cook	Energy efficient lighting as being installed at end of 1996. Energy efficient heating installed in 1992 with new heating system.	Company standard information displayed around site, next to all light switches etc. Hot water calorifier being installed in august 1996. Barflo water savers installed to all urinals.	Energy consumption has remained the same during 1995. Number of staff has decreased. Monitoring of energy usage monthly. Metering of utilities. Change to high frequency lighting cutting energy costs.
Tap01 M.S. Wooden	No energy efficient lighting or heating installed - and is unlikely to be due to the type of building.	Staff are made aware of what can be done to minimise energy consumption. Energy management system prohibited.	Continuous monitoring of energy use. Utilities are metered. No change in energy consumption. Numbers of staff remains the same.

Site Code Site Facility Manager	Heating and Lighting	Staff Awareness Campaigns Power Management Software Fuel Management systems	Metering Energy Trends
TPLC (War04) K. Hayton	Energy efficient lighting installed in 1996. Heating system monitored to check it is operating at optimum performance. Hoping to install CAT 2 lighting during 1996 to meet EEC standards.	Posters around the building and stickers on PCs, printers etc. to switch off each night. Power Management software on approx. 80% of the monitors.	Energy use is monitored. Metering of utilities awaiting advice from Norweb. Energy use has decreased. Environmental committee has been formed to monitor any issues.
Wak01 J. Scofield	No energy efficient heating or lighting has been installed up to now. Plans to put in individual light fittings in all offices, saving C.£1000 p.a.	Staff awareness increased - ongoing, e.g. to switch off equipment when not in use. Newsletter.	Continuous monitoring of energy usage. Energy consumption has decreased. Staff numbers the same.
Win01 D. Flatt	Installed energy efficient lighting during refurbishment. No energy efficient heating installed. Possible plans to install new energy efficient boiler.	Staff awareness increased. Posters on site.	Continuously monitoring energy usage. Utilities are metered. Energy consumption has remained the same. No change in numbers of staff.
Wsr01 P. Sinclair	Ongoing upgrade/replace program for energy efficient lighting installation. Fitted thermostatic control valves to radiators. Possible 3-4% savings.	Beaumont South, Trend Energy Management System in use (5 years). Planning a staff awareness campaign	Fitted some thermostatic control valves to radiators. Utilities are metered, read daily. Energy consumption has decreased. Number of staff has increased.
Ire01/Ire10 Eamonn Donnelly	Energy efficient lighting installed.	Power management software installed	Energy consumption remains the same. Considering transferring to a maximum demand tariff which could result in savings of £4,000 per annum.

Report Number 1

Annex 4

Annex 4:

Batteries and Special Waste Report

European Community Directive 91/157/EEC

European Community Directive 91/157/EEC requires Member States to set up schemes for the separate collection of spent batteries and accumulators containing specified amounts of lead, mercury or cadmium with a view to recycling or controlled disposal. A further Directive (93/72) deals with the marking system to be adhered to. The above regulations apply to England, Scotland and Wales and were made under the European Communities Act 1972. They:

- Prohibit the sale of alkaline manganese batteries with more than 0.025% mercury by weight; button cells and batteries composed of button cells and alkaline manganese batteries containing 0.05% mercury by weight and intended for prolonged use under extreme conditions are exempted; batteries and accumulators containing more than 0.025% cadmium by weight or more than 0.4% lead by weight e.g. lead-acid automotive, nickel-cadmium rechargeable and silver or mercuric oxide
- Require that appliances using batteries covered by the Directive must be designed to ensure that the batteries can be easily removed;
- Introduce a marking system for batteries covered by the Directive to indicate separate collection and heavy metal content; this will not apply to those manufactured or imported into the EC before 1st August 1994; nor will it apply to those marked in Great Britain on or before 31 December 1995.

The first two provisions came into force on 1st March 1994 and the 3rd on the 1st August 1994. The government has yet to announce how it is to implement the remainder of the Directive i.e. to set up a scheme for collection of spent batteries for recycling or controlled disposal.

The Batteries and Accumulators Containing Dangerous Substances Regulations 1994 (SI232).

The Department of Trade and Industry (DTI) is responsible for implementing the EC Batteries and Accumulators Directive (91/157) described above. They transposed certain requirements of the Directive in GB Statutory Instrument 232 in March 1994:

- Prohibition from sale of certain alkaline-manganese cells (other than button)
- Marking with separate collection and heavy metal symbols
- Design of appliances to allow easy removal of batteries

The other requirements of the Directive, e.g. research, separate collection systems, reduction in household waste, are the subject of a voluntary programme which has been drawn up with the industry through their trade associations. This is being examined by the European Commission.

The Department of the Environment have suggested that there is a distinct possibility that the Directive will be extended to cover all types of batteries. The UK statutory instrument in force has created technological initiatives by industry such as the move from Nickel/ Cadmium batteries towards Nickel/ Hydride batteries which are not yet covered by the Directive. In page 5 of " The Batteries and Accumulators (containing dangerous substances) Regulations 1994 ", labelling requirements are detailed. The picture of the wheeled bin with a cross through it, meaning not to be landfilled, can be misleading as wheeled bins are more often than not used for recycling in the UK. Also, the packaging label will be long forgotten with the average life span of the battery being around 5 years in some cases.

Of the batteries targeted by the Directive at present, 95% lead/ acid car batteries are recycled anyway. However, 50% of the batteries in the UK used to contain approximately

1% mercury but no longer do and are not, therefore, covered by the Directive. The main problem with mercury is the implications of incineration which has accounted for its huge reduction in use in countries such as Sweden. This is not so relevant to the UK as incineration is less common.

At ICL

Field Engineer Issues:

- How many batteries should engineers transport?

Issues of manual handling, road safety, controlled wastes, vehicle/equipment contamination - versus - customer/operational requirements

- How should they be packaged and labelled?

ready to hand; Acrylonitrile Butadiene Styrene (ABS) boxes/ stout cardboard + thick PVC bags, UN 'Corrosive' labels ?

- Where can they take them?

- Via D2D MID01 Byley Service Centre

- Direct to battery recyclers:

APM Metals Ltd., Sittingbourne	01795-426021
Frank Barnes (Darwen Ltd.), Darwen	01254-702748
Bidwell Metals Ltd., Hadstock	01761-432391
Cliaencename Ltd., Pudsey	0113-257-1228
Hodgkinson's The New Forest Stationers, New Milton	01425-638960
1. Straker Office Supplies plc., Mitcham	0181-648-3434

Main battery disposal/recycling problems:

1) Lead-Acid batteries in Un-interruptable Power Supply (UPS) units

Service/ repair of UPS (PC UPS contains 5 batteries, DRS6000 UPS contains 30 batteries, and Mainframe UPS contains hundreds of batteries - serviced by Merlin-Gerin, Siemens, etc.). The problem with planning maintenance is an expected failure rate of 1 to

5 units and a current average of two batteries per month. However, the UPS manufacturer often advises complete battery change-out at 5 year intervals.

2) Nickel-Cadmium batteries in Portables

3) Lithium Coins in Store boards/ Mother boards.

The question is, therefore, mainly on the safe packaging, labelling and transport of used Lead-Acid batteries. The Battery Manufacturers Society advises that for the delivery of new batteries you need to adhere to CHIP Regulations, palletise them with stretch-wrap and apply a wet battery label.

For delivery of used batteries there is a need to comply with The Controlled Waste Regulations 1992, give 3 days notice, administer consignment notes and adhere to the duty of care. London Waste Authority is willing to exempt up to 5 batteries.

For packaging they advise the use of strong Acrylonitrile Butadiene Styrene (ABS) pallet boxes with a CHIP/ UN label stating 'Corrosive' and strong PVC bags not sheets because they are prone to slitting. Recycling processes for non-rechargeable dry cell batteries are being developed that are cost effective. Stockpiles can be argued as possibly more hazardous than diluted landfill disposal because of the fire hazard. For more information on these developments contact Paul Duke, British Manufacturers Association on 0171-222-0666.

Also available is 'Opportunities and Barriers to Recycling Batteries', from the library for National Environmental Technology Centre, Tel:01235-463068 Cost: 15 pounds

Special Waste (Amendment) Regulations 1996

The Special Waste Regulations 1996, laid before Parliament on 1 April 1996, will come into force on 1 September 1996 and implement Council Directive 91/689/EEC on hazardous waste as amended by Council Directive 94/31/EC. These Regulations, making a number of technical amendments, were laid before Parliament on 2 August 1996 and will come into force on 31 August 1996. Council Decision 94/904/EC sets out an EC list of Hazardous Waste. Waste may be Classified as hazardous (special) in the UK if it is on the list and possesses a hazardous property. Lead acid batteries will be treated as special waste. The other main provisions are:

- maintain, as far as possible, the existing approach to special waste, through the cradle to grave approach;
- introduce more flexible arrangements for repetitive movements between two sites, and for the collection of wastes from a number of premises on one day. Prenotification under these conditions required only once to cover a twelve month period;
- ban mixing by carriers and consignees of categories of special wastes, and of special with non-special wastes, unless for safe disposal;
- require periodic inspections by regulators of special waste producers; and
- introduce fees, in line with the Government's policy on the 'polluter pays' principle.

There is no de-minimis rule in the Special Waste Regulations, to reflect the requirements in the Hazardous Waste Directive. However, the Agency have been asked to adhere to the principle of proportionality. Collection points for waste must be licensed, unless able to register for exemption under the Waste Management Licensing Regulations 1994 (as amended). In addition:

1) Household waste - still as in part II EPA1990 Act except for:-

(a) asbestos

(b) waste from laboratories

(c)waste from hospital, other than waste from a self-contained part of a hospital which is used wholly for the purposes of living accommodation.

2) Regulation 2 clarifies/ updates cross references to the approved supply list issued for the purposes of the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994. Amended by Chemicals (Hazard Information and Packaging for Supply) (Amendment) Regulations 1996. 3rd edition of supply list - available form HSE Books.

3) Regulation 4 requires Agencies to give unique codes to be applied to consignments of waste - to be shown together with other required information on consignment notes which are to accompany the waste when transported. These regulations amend regulation 4 to allow the Agencies to delay assignment of a code until payment of any fee required in respect of it.

(Does not implement Community obligation)

4) Regulation 8, under Article 5 of Directive, makes special provision with respect to documents required in connection with "carrier rounds" in which special waste is collected from a number of consignors. Only one set of documents to be required in cases where waste of more than one description is collected on carriers round.

5) Regulation 14, makes provision for the payment of fees in connection with supply of codes under regulation 4. If code given before payment of fees then fee must be paid within 2 months of that request. Regulation 14 does not implement Community obligation.

6) The regulations also make minor drafting amendments.

Notes

'Deminimus rule' refers to the fact that no provision is made in the Directive for minimum quantities of waste. The Agency has been asked to adhere to the policy of proportionality - subtly adopted in practise but not communicated. The Department of the Environment has omitted unique codes because they don't yet know what the classification will be - still in consultation (2months late). National Waste Classification Code.

Contact- Terry Coleman 0171-276-8466.

Report Number 1

Annex 5

Annex 5:

The UK Packaging Legislation

1.0 Introduction

In response to the progress of the UK packaging legislation I wrote the following short article, 1.1, and range of presentation slides, 1.2. This enabled both the preparation of an EMC Briefing Paper (Appendix 1, written by Joy Boyce) and more exhaustive presentation slides for a business managers workshop (Appendix 2, written by Joy Boyce). The UK Packaging Legislation was approved by the House of Commons and became law on the 3rd March 1997 (Appendix 3, written by Joy Boyce). I have written questionnaires for targeting key suppliers and the site facilities within ICL, 1.3.

1.1 UK Packaging Legislation Article

The EC Directive on packaging waste requires Member States to recover 50-65% of packaging and recycle between 25-45% with a minimum of 15% for each material by July 2001. The Department of the Environment is expecting to issue draft regulations, on the implementation of this Directive, for laying before parliament in October 1996.

ICL falls into two of the main categories of producer responsibility, packer/ fillers and retailers. In the 15 December Agreement these categories were given 75% responsibility. The Department of the Environment is planning to increase this to 83%, that is packer/ fillers 36% and retailers 47%. The other groups of responsibility are raw material producers 6% share and converters 11% share.

This will be phased in, starting with businesses providing data on packaging flows to the Environment Agency in 1996, and providing evidence that the targets, 40% recovery rate

and an 8% recycling target for each material, are being met from 1998. Financial penalties for non-compliance will come into force from the beginning of 1999.

Monitoring of compliance will be undertaken internally by a company representative for certification of compliance and a sample of firms will be audited by the Agency, which will charge a fee.

Packaging will be exempt from recovery if it has been reused a minimum of three times. Whether firms will have to provide data on wood packaging separately is under discussion.

Recommended Action

ICL sites need to set up management systems to account for packaging waste in and out of the site.

- * Database of packaging flows, inward and outbound to recyclers, as product/ service, disposal sites. Include details such as recycled content and recyclability
- * To promote reuse/ recycling schemes where possible until reverse logistics structure is in place

1.2 Packaging Slides - UK Packaging Legislation Presentation

Legislation is due to come into force Dec 1996

Slide 1

Producer Responsibility

Objective - Sustainable Development - solving environmental problems

It is a Policy framework which encompasses the supply chain to meet the objective

Makes the market work to the benefit of the environment

Encourages a culture change towards sustainability

Why Legislate?

Free Rider difficulties

EC Directive targets:

member states to recover 50-65%

minimum of 15% recycling per material

'Daughter' Directives/ Decisions

- Formats for Databases

- Material Identification System

- Marking

Slide 2

Main Elements of producer responsibility:

- * All businesses in the supply chain should take a share in the responsibility for the waste
- * Compliance schemes should be business operated
- * All businesses should share the costs of establishing these schemes and an increased share in the costs of meeting national recovery and recycling targets
- * Proaction to sustain the existing recycling and recovery infrastructure
- * Support for increasing end use markets

Slide 3

The Packaging Chain

Govt. consulted over 5,000 businesses - majority of which favoured sharing responsibility over the supply chain.

The sectors are defined as:

- *1 Packaging raw material manufacture ----->
- *2 conversion of packaging raw materials into packaging ----->
- *3 packing and filling packaging ----->
- *4 selling (e.g. wholesaling/ retailing) packaging

Downstream businesses (packer/ fillers and retailers)

- modify buying specifications and consumer attitudes

Upstream businesses (raw material manufacturers and converters)

- cooperate on providing processing capacity and outlets for collected material

Cut off Threshold: Businesses over 50,000 pounds turnover

slide 4

Obligation Weighting

The percentage obligation for businesses performing any of the relevant activities are as follows:

Raw material manufacturing	6%
Converting	11%
Packing/ filling	36%
Selling (eg.retailing)	47%

A business carrying out more than one activity would have an obligation for each activity performed.

ICL carries out both the packing/ filling and selling obligations. A total obligation of 83% on most of its packaging.

Slide 5

Exports, Imports and Transit Packaging

Exports excluded - UK obligation is to waste in the UK

Imports included - With the additional obligation for the importer of those preceding stages that would otherwise not be picked up in the UK.

e.g. For 100 tonnes imported for packing/ filling - the importer picks up the obligation not only for packer/ filler but also for preceding stages, raw manufacture and conversion i.e. 6+11+36=53%

Where ICL imports packaged goods and sells them to the consumer it will pick up 100% obligation on this.

All importers will pick up 100% obligation on the Transit packaging around direct imports.

Slide 6

Targets

Directive to be met by 2001:

Recovery target- min 50%

Recycling target- min 25%

The national recycling target is to recycle a min 15% by weight of each packaging material.

Interim targets to be met in 1998:

Recovery target- min 40%

Recycling target- min 8% for each material

All targets are by weight

Excludes exports, process waste and any reusable packaging (reused 3 times min)

Specific materials to which the targets apply:

* glass

* metals

* paper fibreboard

* plastics

[* wood]

Slide 7

Registration

* Register with, and send packaging flow information in to, the appropriate Agency (the Environment Agency/ the Scottish Environment Protection Agency, SEPA)

* Proposal to register by 25 Feb 97 & provide data by 22 Apr 97

- * Annual fee expected (subject to separate consultation)
- * Agency is responsible for:
 - monitoring the business
 - collecting its certificate of compliance
 - collating national data for report to European Commission
- * Certificate of Compliance to be provided at end of each year, starting Dec 98 to certify that the necessary tonnages of packaging waste have been recovered and recycled
 - proposed self-certification with external sample audits by the Agencies
- * All packaging weights by material breakdown admitted on forms to the Agency.
- * Full database of certain proposed format

Slide 8

Database, Marking and Auditing

- * Weight printed on the packaging by material type
- * Auditability - Integrity of information and data collection

Database - thorough, exhaustive, adaptable, and meets all legal requirements.

The data required, starting from the previous year, is as follows:

1. The total packaging produced in the UK
2. Packaging exported
3. Packaging imported
4. Transit packaging
5. Recycling and Recovery of packaging
6. Reused packaging (especially wood)

Slide 9

Calculations

Not including exported packaging or re-used (at least 3 times) packaging but including all imported packaging (with previous activities obligations) and all imported transit packaging.

1. packaging x activity x UK recovery = recovery
 handled obligation target obligation
 (weight) (%) (%) (weight)
2. packaging x activity x UK recycling = recycling
 handled, obligation target target,
 by material (%) (%) by material
 (weight) (weight)

e.g. Import: 1000t plastic packaging

Export: -200t = 800t

200t packaging sold to retailer (200t @ 53% obligation)

600t @ 100% obligation

Recovery = (600t x 100% x 50%) + (200t x 53% x 50%) = 353t

Obligation plastic

Recycling = (600t x 100% x 15%) + (200t x 53% x 15%) = 106t

Target plastic

Slide 10

Actions/ Conclusions

- * Full audit of ICL packaging UK and imported
- * Full audit of "bought in" transit packaging
- * The provision of packaging weight data to customers
 - marking packaging with breakdown of materials by weight
 - necessary adjustments made for process waste from packaging, imports of packaging, exports of packaging, and reusable packaging.
- * Full database records created meeting all legal requirements
- * Communication with reprocessors/ recyclers

The Producer Responsibility Obligations (Packaging Waste) Regulations 1997

The draft statutory instrument for the Packaging waste regulations under section 93 (10) of the Environment Act, brought various changes as a result of intensive lobbying by businesses. The now predicted date for registering with the Environment Agency, or a collective scheme, is August 1997. The annual return date for all packaging materials and for each packaging flow for the previous year is now 1 April from 1998 onwards.

The UK targets have been revised to the following:

	1998-1999	By 2000	By 2001
Overall recovery:	38%	43%	52%
Recovery of UK packaging waste:	32%	40%	50%
Min. recycling target for each material:	7%	11%	16%

Businesses with a turnover of less than £5m (falls to £1m on 1st January 2000) or which handle less than 50 tonnes packaging are exempt from the obligations. The registration fee to the Environment Agency has been set at £750 p.a. per business. There will be an obligation on businesses to produce reusable packaging although it remains excluded from the recovery/ recycling obligations when it is reused. The modifications allow producers of special or hazardous waste not to include this when calculating their obligation, although it still has to be accounted for and included in the threshold limits. The Department of the Environment (DofE) definition of hazardous and special waste in this context is yet to be clarified but it is said to be packaging that is hazardous and contaminated such that it requires special disposal methods.

1.3 Packaging Legislation Questionnaires

1.3.1 QUESTIONNAIRE FOR KEY ICL SUPPLIERS THE UK PACKAGING REGULATIONS

The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997 were approved by the House of Commons on Monday 3rd March, and are now law. Together with the introduction last year of the Landfill Tax and its anticipated annual increases, this new legislation further emphasises the need for improvement of waste management systems.

The cost of waste management to businesses is going to substantially increase over the coming years. Reductions in materials consumption are important, not only for environmental reasons but also for good business practice and use of our resources.

The Department of the Environment will require us to account for our packaging waste and non-compliance is a criminal offence. We therefore need your co-operation to complete the following. Please could you take a little time to give us the following information - approximate figures are welcomed.

Name

Job Title

Business

1. Who is responsible for waste management in your business group?

.....

2. Are you aware of the UK packaging waste regulations?

.....

3. Are you planning to register with a collective scheme (e.g., VALPAK) or independently with the Environment Agency?

.....

4. Who is your site or company waste management company?

.....

5. Are you planning to set up a packaging waste database?

.....

6. How much packaging, by material type and weight do you pass to the ICL group of companies per annum in the UK?

.....

Many thanks for your co-operation in giving us this information. If you want to discuss the questions or any aspects of the packaging legislation, please contact us.

1.3.2 QUESTIONNAIRE FOR ICL SITES
THE UK PACKAGING REGULATIONS

The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997 were approved by the House of Commons on Monday 3rd March, and are now law. Together with the introduction of the Landfill Tax and its anticipated annual increases, this new legislation further emphasises the need for the ICL Group to control its waste management systems.

The costs of waste management to the ICL Group per annum is going to substantially increase over the coming years. Reductions in materials consumption are important to us, not only for environmental reasons but also for good business practice and use of our resources. The easiest and least expensive way of adhering to the new packaging legislation is to use our backdoor arisings.

The Department of the Environment will require us to account for our packaging waste and non-compliance is a criminal offence. We therefore need your co-operation to complete the following questionnaire as part of a preliminary assessment. Please could you take a little time to give us the following information, approximate figures are acceptable.

Name

Job Title

Site and Business

1. Who is responsible for waste management at your site and in your business group?
.....

2. Are you aware of the packaging regulations?

.....

3. Do you recycle and/ or reuse packaging? If so, do you have a compactor?

.....

4. Who is your site's waste management company?

.....

5. How many tonnes/ skips of waste does your site produce per annum?

.....

6. How much do you spend on waste management per annum?

.....

7. Do you separate out waste arisings? If so, into what?

.....

8. Do you have any data on types and amounts of packaging waste arisings at your site?

For example numbers of cartons, numbers of plastic bottles etc. If so, in what data and in what format? Approximate figures are also very helpful.

.....

9. Do you know how much of the waste from your site goes to landfill, and if so, can you tell us how much it is? If it is not possible to give a tonnage for landfilled waste, let us know how much you are charged for landfilling by your waste management company.

.....

10. If you recycle any of the waste arisings from your site, can you tell us what you recycle, roughly how much you recycle per annum, and any costs associated with recycling or any revenues that accrue - even if these are given to charity (for example, some sites recycle aluminium cans and give the money to a local charity).

.....

Many thanks for your co-operation in giving us this information. If you want to discuss the questions or any aspects of the packaging legislation, please contact us.

Corporate Environmental Affairs Department, LON11

Tel: 7221 3179

Fax: 7221 6671

Annex 5

Appendix 1

Management Executive Board Briefing Paper

By Joy Boyce

MANAGEMENT EXECUTIVE BOARD : BRIEFING PAPER

UK PACKAGING AND PACKAGING WASTE REGULATIONS

IMPLEMENTATION COSTS, RISKS AND OPPORTUNITIES FOR THE ICL GROUP

The Department of the Environment has issued a Consultation Paper on the above regulations. The consultation period ends on 30 September. ICL has made representation through the FEI and will also be responding to the President of the Board of Trade, as well as to the DoE and the DTI.

The Regulations are expected to be brought into force by the end of 1996 under the powers given to the Secretary of State for the Environment with the 1995 Environment Act. Time is scheduled for parliamentary consideration of the Regulations this autumn.

The objectives of the Regulations are:

- * to implement the EC Directive on packaging waste which sets targets for recovery and recycling whilst ensuring a single market for free circulation of packaging;
- * to implement the "Producer Responsibility" concept as HMG's policy framework to achieve Sustainable Development by making the market work to the benefit of the environment and encouraging a culture change towards sustainability

The main elements of Producer Responsibility (which will also be applied to other waste streams, notably the end-of-life IT equipment waste stream) ensure that

- * all businesses in the supply chain share responsibility for recovery and recycling
- * compliance schemes are operated by business not government
- * costs are borne by business
- * business works to support and develop end use markets.

The Packaging Chain

The entire packaging supply chain is, therefore, involved in percentage responsibility for recovery and recycling of packaging waste. The draft legislation defines this packaging chain as:

- * raw materials manufacturers (who produce plastics, metals etc and sell to the producers of packaging)
- * converters (who design and produce packaging)

* packer/fillers (who cause converters to manufacture packaging which they then fill with goods)

* seller/retailers (who sell goods to end users or consumers)

ICL is both a packer/filler and a seller/retailer.

Activity Obligations

Each of these activities carries an activity obligation:

* raw materials manufacturers	6%
* converters	11%
* packer/fillers	36%
* seller/retailers	47%

of the total tonnage of packaging materials handled. So much of ICL's packaging attracts a total activity obligation of 83%. Where we sell to a third party of retail outlet our activity obligation is only 36%.

Imported packaging brings with it the activity obligations of the activities performed outside the UK. So packaging imported around goods from Finland comes with the 53% total activity obligations of the Finnish raw materials, converters and packer/fillers. If this packaging is sold to an end user it gives ICL, as the seller/retail, a 100% activity obligation on the total tonnage of packaging. If it is sold to a retail outlet or a third party, ICL carries the 53% obligation and the retailer carries the 47% obligation. This also applies to imported transit packaging and packaging around components and sub-assemblies imported from anywhere outside the UK.

UK National Targets

As well as activity obligations, there are also UK national targets for both recovery and recycling.

The EU directive sets down a European wide target for the recovery of a minimum of 50% by weight of all packaging waste by the year 2001. Of this 50% recovery, it also sets down a minimum recycling (not including incineration for energy recovery) target of 25% by weight.

Whilst accepting these EU targets, HMG has set interim targets for British industry. These are a recovery target of a minimum of 40% of all packaging waste by 1998, of which 8% minimum will be recycled.

The packaging materials to which these targets apply are paper/fibreboard, all types of plastics, glass and all types of metals. Wood is not included in the recovery and recycling targets, however, business will be expected to provide data on wood used in packaging, its re-use, recovery and any recycling undertaken.

Exclusions

Exclusions to the regulations include the following:

- * All exports from the UK. In the same way that imports carry activity obligations with them, so exports reduce our total tonnage obligations.

- * All re-usable packaging, although businesses claiming this will be expected to prove that the packaging has been re-used for a minimum of three trips/rounds.

- * Businesses anywhere in the packaging chain who handle less than 50 tonnes of packaging per annum. Their activity obligation is passed to the next activity down (or up if a retailer) the chain. For example, if ICL buys packaging from a small converter whose output is less than 50 tonnes per annum, ICL picks up the converter's 11% activity obligation on all packaging supplied to ICL. If that converter also buys from a raw materials supplier who also falls below the 50 tonnes p.a. threshold, that activity obligation also passes down the chain to ICL.

Because obligations can be passed up and down the chain, players in the chain will be expected to ensure a free flow of information on packaging types, tonnages etc.

Obligations on Business

Under the Regulations, all businesses above the 50 tonnes p.a. threshold are obliged by law to take part in the scheme. This means accepting a legal liability, registering with the Environment Agency and also implies liabilities to:

- * provide data on packaging flows,
- * prove the credibility of the data,
- * provide data on the legal obligations for recovery and recycling of total tonnages by material type (after deducting exports and adding in imports),
- * undertake (or subcontract) the recovery of the total tonnages by material type,
- * pay for the recycling of the total tonnages.

In order to provide the complex data it will be necessary to set up databases and develop software to carry out the calculations. (This offers ICL business opportunities, see below)

Key Dates

- * Register with Environment Agency by 25 February 1997
Registration is annual, as is the filing of a packaging flow return for the previous year on which obligations for the current year are calculated.
We also need to pay an annual fee to the Environment Agency.
- * Provide data on packaging flows from 1996 figures by 22 April 1997.
- * At year end, provide the Agency with a Certificate of Compliance that the obligations for recovery and recycling of the total materials tonnages have been met. This Certificate to be signed by the CEO or MD of the business.

Offences

There are a range of CRIMINAL offences connected with failure to comply to the packaging waste legislation. These are:

- * Failure to register to the scheme
- * Failure to provide require data
- * Failure to provide Certificate of Compliance in time frame
- * Failure to recover required tonnage
- * Failure to recycle required tonnage
- * Certification based on false evidence/records
- * Provision of false or misleading information

Alternatives

A business's legal obligation under this legislation can only be off-set by joining a business led collective compliance scheme. If a business comes to a contractual arrangement with a third party of a scheme to carry out part of its recovery or recycling obligation for it, this does not make the business a member of the scheme, nor does this arrangement off-set its legal obligation.

There is as yet only one such business-led collective compliance body. It is called VALPAK and is in the process of being set up. VALPAK's prospectus will not be available until early 1997. Its costs are as yet unclear, and it is at present enjoying a monopolistic position. VALPAK's members, to date, comprise the packaging and food industries. In conversations with ICL's Environmental Affairs Unit it has demonstrated that it has little understanding of either the complex packaging flows or the volumes and types of packaging materials used by industries such as electronics, IT, telecommunications etc.

Advantages of Joining a Collective Compliance Scheme

By joining a scheme, a business can (at a price) pass its legal liabilities to the scheme. The business no longer has to register with the Environment Agency and pay its fee, nor does it need to provide a Certificate of Compliance at year end. (The level of fee payable to the Environment Agency has not yet been set and will be the subject of another Consultation Paper whose publication date is said to be end August/early September.)

After joining a scheme a business does, however, still need to set up a database, collect data, calculate its total tonnage obligations for both recovery and recycling by material type. It needs to pass this information to VALPAK (or other such scheme). It is unclear at this time whether there is still an obligation on the business to put in place (or continue with) the logistics to recover and return to a recycler appointed by VALPAK some or all of its total tonnage obligations.

[NOTE: Under the regulations, businesses are not obligated to recover and recycle its own packaging, only the total obligated tonnage by material type of any packaging. This means that packaging "bought" by ICL, surrounding goods of which we are the consumers can be recovered and recycled and off-set against our total obligated tonnages.]

Disadvantages of Joining a Scheme (VALPAK)

Costs: In year 1 (1997) cost to ICL of VALPAK membership will be £50,000. This is set to rise to around £500,000 plus by beginning of year 3 with the additional burden of levies on tonnages of materials which are deemed (by VALPAK) as being "difficult" to recycle (e.g., plastics). These levies could also be affected by the glut of or lack of demand for certain recyclates on the open market.

In effect, VALPAK can set its levies as and when it wants, within the parameters of its appointed role of ensuring recovery and recycling, the total tonnages of which both HMG and VALPAK readily

admit they have little reliable data. Its revenues will be used for pump-priming the investment levels necessary to carry out specialist recycling, the setting up of new recycling plants, investment in the packaging industry to ensure recycle usage and the purchase of Certificates of Compliance for all the businesses within its scheme.

By joining VALPAK we will be paying a new form of business tax which will be used as investment for the packaging and recycling industries which will undoubtedly profit from this. There is little advantage to a group like ICL other than "buying off" the threat of prosecution.

It is also unclear whether VALPAK will remain a not-for-profit organisation. Like HMG's tardy performance in producing the Consultation Paper, VALPAK is late with its outline prospectus, its first Director has just resigned, and there is doubt amongst businesses whether it can fulfil its mission in the short term.

Decision Points for ICL

1. Should ICL join a business led collective compliance scheme like VALPAK?
2. Should ICL (as a large contributor to FEI total fee base) encourage the FEI to set up an electronics industry scheme, given the complex overlapping packaging flows within the industry?
3. When registering either with the Environment Agency or with a business-led collective compliance scheme, should ICL register the entire group of companies as ICL plc or encourage individual subsidiaries/businesses to register individually.
4. Should we set up a central packaging database into which each business deposits data on its flows, measurements, weights etc.
5. Since information on overall costs is scant, should the costs of compliance (in the first year at least) be funded centrally?

Recommended Immediate Action

The time scales for compliance with this legislation are extremely tight. ICL has the advantage of ready access to IT systems, IT skills, high levels of project management expertise. The following actions are necessary in order to achieve the key dates:

- * the setting up of a central packaging database;
- * packaging suppliers required to provide data on weight of individual packaging pieces;
- * packaging suppliers required to print on each packaging item its weight;
- * service level agreements with a wide range of suppliers to reflect the data requirements of the UK (EU member states) packaging regulations;
- * a group-wide packaging audit to be carried out with a view to reducing amount of packaging, moving away from materials which are expensive to recycle (plastics) to paper/wood based packaging;
- * re-usable packaging to be considered as a viable, cost effective option and our tonnage obligations to be reduced by, for example, designating all mainframe, larger system packaging re-usable and returnable.
- * each ICL business to appoint a Packaging Co-ordinator to ensure collation of information, drafting of packaging flows, packaging reduction exercises, and provision of information to a central ICL point.
- * appointment of an overall co-ordinator of packaging for the ICL group of companies.

Inherent Risk Exposure

- * over zealous packaging reduction may result in transit damage and consequent cost;
- * continued reliance on traditional packaging materials (e.g., EPS for end-caps) could result in exposure to high recycling costs;
- * lack of resources/budget to quickly develop an auditable, comprehensive and flexible database could result in risk of prosecution;
- * increased cost base will be incurred whichever way we deal with this legislation - we need to work together across the group to minimise costs and to maximise opportunities from this legislation.

Opportunities

The Packaging Waste Regulations is the first piece of UK environmental legislation which has a direct effect on every business over a certain size in all sectors of industry. There is a concern that the tone and detail of this legislation could form a template for legislation to deal with other priority waste streams, in particular the electronics end-of-life waste stream.

There is a specific cost reduction opportunity associated with this legislation with the reduction in the amount and type of packaging used.

A revenue stream opportunity is offered with the development of software and database applications for packaging data collection, calculation, manipulation. Another opportunity presents itself with the development of supplier intranets, carrying information between suppliers, customers, third parties and the Environment Agency.

Moreover, the legislation provides us with an opportunity to demonstrate our project management skills, as well as to enhance our quality and environmental profile.

Joy Boyce
Environmental Affairs Unit
Corporate Affairs, LON11.

September 1996

Annex 5

Appendix 2

UK Packaging Legislation Workshop:

Agenda, by Alison Hughes

Presentation Slides, by Joy Boyce

Minutes

Agenda

- 09.45 Coffee
- 10.00 George Hall, Head of Corporate Affairs, ICL plc -
Welcome, today's programme
- 10.15 Tony Adderley, General manager, Byley (MID01), D2D
A successful ICL take-back, refurbishment and
recycling operation
- 10.40 Joy Boyce, Corporate Environmental Affairs Manager
Our competitors' activity in take-back, refurbishment
and recycling
- 11.15 Coffee
- 11.30 Discussion
- 12.00 George Hall
Packaging overview; activity in EU member states;
effect of UK legislation on the ICL group
- 12.30 Lunch
- 13.15 Joy Boyce
Detailed overview of UK packaging legislation
- 14.00 Discussion and brainstorming - chaired by George Hall
- 15.00 Tea and finish



UK Legislation on Packaging Waste



What IT Means For ICL

Producer Responsibility - Packaging Waste

- Transposal of 1994 EU Directive on Packaging and Packaging waste
- Proposed UK Regulations made under the Environment Act 1995
- 1995 Act gave Secretary of State for the Environment wide powers to enforce producer responsibility regulations



PRODUCER RESPONSIBILITY - PACKAGING WASTE

Producer Responsibility

Objective:
Sustainable Development - method for Solving environmental problems

Producer Responsibility is HMG's Policy framework encompassing the Supply chain to achieve Sustainable Development



PRODUCER RESPONSIBILITY - PACKAGING WASTE

Producer Responsibility

- Makes the market work to the benefit of the environment
- Encourages a culture change towards sustainability



PRODUCER RESPONSIBILITY - PACKAGING WASTE

Main Elements of Producer Responsibility:

- All businesses in supply chain share responsibility for specific waste streams
- Compliance schemes are business operated
- All businesses share costs of scheme establishment
- All businesses take increased share of costs of meeting national recovery / recycling targets
- Proactive to sustain existing recycling / recovery infrastructure
- Support of increasing end use markets



PRODUCER RESPONSIBILITY - PACKAGING WASTE

Who Is Responsible? The Entire Packaging Chain

- Proposed UK legislation framed to Ensure responsibility is shared Throughout packaging chain



What Is the Packaging Chain? Draft Legislation Defines It As:

- **Raw materials manufacturers**
Produce : plastics (flakes, granules, liquid resin etc.)
Metals (sheets, coils, ingots)
Paper / board (sheets, rolls)
Glass (molten glass)
- **Converters** - manufacture packaging from these materials
- **Packer / filler** - buys packaging from converter and packs with goods
- **Seller / retailer** - sells goods to end user or consumer



Activity Obligation

A business in any of the four activities in the Chain picks up percentage activity obligation Of its total tonnage of packaging / packaging Materials handled:



Activity	Obligation
Raw materials manufacturers	6%
Converters	11%
Packer / filler	36%
Seller / retailer	47%

Activity Obligation

What Does This Mean for ICL?

- As "packer / fillers" and "seller / retailers" most Of our packaging attracts the 36% and 47% Activity obligations



Activity Obligation

What Does This Mean for ICL?

- Example:
TeamServers sold direct to UK customers, packaging attracts following obligations:
 $36\% + 47\% = 83\%$
- Example:
TeamServers sold to UK Value Added Reseller, packaging attracts only 36% obligation
The 47% obligation is responsibility of the VAR



Activity Obligation

Imported Packaging

- Where packaging is imported, obligations of activities performed outside the UK are "rolled-up" to next activity in the chain

6%	6+11%	6+11+36%	+47% =100%
Raw Materials >>	Converter >>	Packer/ filler >>	Seller
6%	11%	36%	47%



Activity Obligation

What Does This Mean for ICL?

- Example:
- *Ergopro*s manufactured in Finland and sold to UK end users by ICL -
Packaging obligations = 100%
(6 + 11 + 36 + 47%)
 - *Ergopro*s manufactured in Finland and sold to UK retail outlets (Dixons, PC World) - packaging obligations = 53% (6 + 11 + 36%)



Activity Obligation

Imported Transit Packaging

- All imported transit packaging attracts a 100% activity obligation
- This is in line with the “rolled up” activity obligations of packaging which is sold to users or retailer



“

Activity Obligation

Imported Transit Packaging

- For ICL this means packaging of imported components, sub-assemblies, whole units for systems integration projects carries a 100% obligation
- This is in addition to obligation on ICL packaging which eventually surrounds these products



“

Why Legislate?

- **Free rider difficulties**
- **EC Directive targets:**
 - * Member states to recover 50-65% of Total packaging
 - * Member states to recycle min. 15% Of each packaging material
- **‘Daughter’ directives / decisions:**
 - Formats for databases
 - Material identification system
 - Marking



“

UK National Recovery Target

As set down in EU Directive:

- By 2001 - Recover a min. Of 50% of All packaging waste
 - Recycle a min. Of 25% of Recovered waste
- Both targets by weight



“

UK National Recovery Target

Interim Targets

- By 1998 - Recover a min. Of 40% of All packaging waste
 - Recycle a min. Of 8% of Waste recovered
- Both targets by weight



“

Packaging Material to Which Targets Apply

- Paper / fiberboard
- Plastics - all types
- Glass
- Metals - all types
- Wood - not included in calculation of Recovery and recycling obligation however, we must provide data On wood used (including pallets)



“

Exclusions

- Reusable packaging
Need to prove it is re-used minimum of 3 times
- Businesses handling less than 50 tonnes packaging Pa.
Their obligation passes up or down the chain
- All exported packaging



Calculating Our Total Tonnage Obligation

All tonnages are calculated in material type, not Total weight of complete system packaging



Examples:

- Packaging for a PC comprises weights of
 - Cardboard
 - plastics
- Packaging for a mainframe comprises weights of
 - Cardboard
 - plastics
 - wood
 - metals
- Packaging for software, documentation etc.
Comprises weights of
 - Cardboard
 - plastics
 - wood
 - metals

Calculating Our Total Tonnage Obligation

- Information is supplied to Environment Agency on Data Forms. A full description of how we have collected the data must be attached to the return
- This must be returned to Environment Agency by 22 April 1997 and be based on data from operations on packaging in 1996



Calculating Our Total Tonnage Obligation

- Step One:
Calculate metric tonnages of paper, glass, metals, plastics and wood (separate figure for each material type) we have used to pack products during the previous year;

Then from this calculate metric tonnages of paper, glass, metals, plastics and wood we have sold direct to the end users and to retailers (from sales figures)



Calculating Our Total Tonnage Obligation

- Step Two:
Calculate tonnages as before of packaging material types which are direct exports, both pack / filling and sold to end users



Calculating Our Total Tonnage Obligation

- Step Three:
Calculate tonnages as before of packaging material types which are imported around goods, and also transit packaging around imported goods
This information is then split out to show the rolled-up obligations on imported packaging



Calculating Our Total Tonnage Obligation

Examples:

We have a 100% obligation on imported transit packaging, and on imported product packaging sold to end-users, but only a 53% obligation on imported product packaging passed on to a retail outlet or VAR - they pick up the final 47% unless they handle less than 50 tonnes of packaging per annum, in which case we are liable for the total 100%



Calculating Our Total Tonnage Obligation

• Step Four:

Calculate total obligated packaging tonnages
This is done by taking the first set of calculations and subtracting from them (by material types) the figures for the exported packaging material types

Then to this figure we add the figures for total materials obligation on imported packaging, both product and transit packaging



Calculating Our Total Tonnage Recovery and Recycling Obligation

• Step Five:

As we only perform packer / filler and seller activities we calculate as follows:

[40% (UK Recovery Target) x total packer/filler tonnage x 36% (UK packer/filler obligation)]
+ [40% (UK Recovery Target) x total retailing tonnage x 47% (UK retailer obligation)]
+ [40% (UK Recovery Target) x total imported packaging tonnage x 100%]

=Our recovery obligation



Calculating Our Total Tonnage Recovery and Recycling Obligation

• Step Six:

We now have to calculate our recycling obligation
For this we need to calculate for each material at each stage

Example.

[8% (UK Recycling Target) x packer/filler plastic tonnage x 36% (packer/filler obligation)]
+ [8% x retailing plastic tonnage x 47% (retailers obligation)]
+ [8% x total imported plastic packaging tonnage x 100%]
= our recycling obligation for plastic

and so on, for paper / cardboard, metals and any other material



What do we need to do to comply with this legislation?

- Registration (by 25 Feb 1997) with the Environment Agency as a business which handles more than 50 tonnes of packaging pa.
- Provide data on packaging flows as outlined up to Step Four above by 22 April 1997 on 1996 data
- Registration is annual, as is the filing of a packaging flow return for the previous year, on which obligations for the current year are based



What do we need to do to comply with this legislation?

- Pay an annual fee (for the pleasure of doing all this !!)
- Provide a Certificate of Compliance at year end, beginning December 1998
- This Certificate to be signed by MD or CEO of the business



Failure to comply is a CRIMINAL offence

Offences are:

- Failure to register to the scheme
- Failure to provide required data
- Failure to provide Certificate of Compliance in time frame
- Failure to recover required tonnage
- Failure to recycle required tonnage
- Certification based on false evidence / records
- Provision of false or misleading information

ICL

What Practical Steps Can We Take?

- Devise a packaging flow chart for each business showing what kinds and how much packaging roughly flows within and without the business stream
- Look at devising packaging flow software for own use and for sale to our customers (none is available yet)
- Audit our own packaging with a view to reduction

ICL

What Practical Steps Can We Take?

- Audit our own packaging and collect data on weight of each packaging piece by type of material
- Consider making some packaging re-usable / returnable
e.g. mainframe pallets / crates / bolts are high value / high weight items; make them re-usable and we take them out of the packaging flow and reduce our tonnage obligations. We must be able to prove usage for three rounds

ICL

What Practical Steps Can We Take?

- Set up a Group wide packaging database to manage information on each packaging type, tonnages, sales, exports, imports, internal packaging flows
- ICL has very complex packaging flows - an effective database will be an attractive product for our customers

ICL

Are there any alternatives?

- We can join a scheme which takes on our legal obligation
- As yet only one is in process of being set up
- It is called VALPAK and it is heavily oriented to the packaging and food industries
- Costs of joining a scheme are still not clear; mention of £50K for first year for businesses with turnover over £500 million, subsequent years a mixture of turnover and packaging type and tonnage

ICL

Are there any alternatives?

BUT

- We still have to provide the detailed data from which our obligations are calculated
- We still have to recover packaging and return to recycler
- What we get from VALPAK is a £50K "Get out of Jail" card which lets us off our legal obligations. They also issue the Certificate of Compliance for our businesses

ICL

Are there any alternatives?

BUT (Continued)

- VALPAK uses subscriptions to pump-prime the recycling industry in order to facilitate investment in technology to ensure recycling of "difficult packaging" materials
- VALPAK also uses our subscriptions to buy compliance certificates to safeguard the Government from fines from Brussels (and to safeguard itself from prosecution)
- VALPAK is at present a "not-for-profit" organisation, but there is a view that it will be split into two divisions next year, a "not for-profit" and a profit making organisation

ICL

VALPAK

- At present holds a monopolistic position
- Prospectus due in September, now unlikely to be published until early 1997
- Has no representation from electronics industry and demonstrates lack of understanding of its complex packaging flows
- Is heavily oriented to the packaging industry and the food industry
- Little information on costs of joining VALPAK and on complete range of their services

ICL

VALPAK Costs

- Year 1. COSTS ARE CAPPED AT MAX. £50,000 PER ORGANISATION
- Year 2. COSTS WILL BE ACCORDING TO TONNAGE AND TYPE OF MATERIAL
- Year 3. MATERIALS LEVIES WILL BE IMPOSED ON MEMBERS
Example £100 per tonne for plastics recycling
Number and type of projects increases, so a ten-fold increase in subscription plus levies
FOR ICL THIS COULD MEAN A COST OF £1 MILLION PLUS FROM 1999 !

ICL

Conclusions

- Packaging regulations are a new tax on industry
- This tax will be of direct benefit to the recycling industry which will be pump primed with investment
- Packaging industry will also benefit from a cheap ready-made source of recycle

ICL

Conclusions (Continued)

- VALPAK is a scantily disguised "Quango" and a job creation exercise
- VALPAK's director has already resigned
- VALPAK fears that without proper knowledge of quantities and types of industrial packaging, it has risk exposure in meeting legal obligations
- ICL Environmental Affairs invited to join VALPAK advisory body to give its valued industrial viewpoint - if we pay £25,000 subscription for rest of 1996 !

ICL

Decision Points for ICL

- Do we join VALPAK or effect our own group / industry take back scheme?
- Do we encourage FEI to set up an electronics industry scheme?
- Do we register as ICL Plc because of our complex internal packaging flows?
- Do we encourage ICL businesses and subsidiaries to register separately and sink or swim?

ICL

Recommended Actions

- Central packaging database to be set up immediately
- Packaging suppliers to be required to provide data on packaging weights
- Weights of packaging to be printed on each item
- Service level agreements to reflect requirements of packaging regulations
- Specific agreements with component suppliers, complex supply chains for systems integration projects, WML agreement



Risks

- Over zealous packaging reduction could result in transit damage and resultant cost
- Reliance on traditional packaging materials (EPS) could result in exposure to high recycling costs (either VALPAK's or our own) - cardboard is cheapest packaging to recycle
- Lack of resources / budget for provision of auditable information, flexible database could result in prosecution
- Costs will be incurred whichever way we deal with this legislation - we need to minimise them



Opportunities

- This is the first piece of UK environmental legislation which has a direct effect on the everyday running of all businesses in the UK
- It presents opportunity to reduce the cost of packaging
- Opportunity to develop software and database applications for customers
- Opportunity to revise packaging materials for less costly, more easily recycled alternatives
- Opportunity to enhance our quality / environmental profile



Action Minutes of "Legislative Threats and Recycling" Meeting held
at Lon11 on 3rd September 1996

List of Attendees

A.T.Adderley, J.G.Boyce, A.H.Davies, Rod Gibberd,
G.Hall, B.P.Lee, I.M.Mathew, S.Ralph, M.W.Sowerbutts,
S.Warwicker, J.Whalley, M. Perry

Actions

1. Steve Warricker, Retail - greater visibility for spares/
discs etc. to be discussed
Fall out and pressure from retailers (e.g. M&S)
2. Mr A. Rowley, Director Year 2000 Programme, to be contacted -
Opportunities for end of life from year 2000 duds
3. Retail to set up systems to register environmental
information on product destinations and packaging flows
4. Information on packaging legislation developments over EU
member states to be sent out quarterly, ongoing.
5. Ken Ridgway, Financial Services Slh01 and Andrew Harte, HPS
Rea21 to be contacted on these issues
6. After assessment of the problem, innovation and lateral
thinking possibly through liaison with Universities
7. Terry Luddington, Finance and Business Strategy to be
contacted on centralised sales information hardware
8. Dave Berrett, John Elmore Group to be contacted on IT
development
9. A simple computerised questionnaire and/ or table to be
designed as an initial step towards ensuring conformity in
centralising information
10. List of Valpak members names to be sent to Steve Warwicker

George Hall's Observations:

1. Department of the Environment officials to be brought in for
a meeting on the issues
 - A. To answer the questions that environmental affairs can't
 - B. To explore questions like:-
 - What are the implications on innovation
 - What are the implications on Valpak
2. Questions should be sent in to Environmental Affairs
3. Going to MANEXEC

Annex 5

Appendix 3

**Brief of the Draft Producer Responsibility Regulations (Packaging Waste) Becoming
Law**

By Joy Boyce

ref: jgb/packaging/reg.approv

DRAFT PRODUCER RESPONSIBILITY OBLIGATIONS (PACKAGING WASTE)
REGULATIONS 1997 ARE APPROVED BY THE HOUSE OF COMMONS

On Monday 3rd March, after a debate lasting 90 minutes, a motion to approve the draft regulations (which had been laid before the House on 29th January) was put to the House and approved.

This means that the AMENDED draft regulations, as outlined in my communication of 17th January 1997 are now law.

Key points (together with some of their implications for the ICL group) made during the debate are as follows:

1. Robert B. Jones, Minister for Construction, Planning and Energy Efficiency, in answer to a question (on whether coat hangers are packaging!): "The regulations do not lay down that degree of detail. They are broad definitions and it will be for industry, working with the Environment Agency, to ensure that what happens in practice reflects the spirit of the measure that we are placing before the House."

1.2 From this we can deduce that, where the regulations are unclear, we should continue our dialogues with the DoE and the EA to ensure that we achieve the definitions that are most beneficial to the ICL group.

2. Robert B. Jones, in answer to a question regarding how shared responsibility is possible in a market scenario: "The market is the only force powerful enough to deliver the objective of sustainable development."

2.1 This comment was made fairly early on in the debate, and was vigorously discounted by several speakers, including some from the Government back benches, who voiced the same disquiet as we have in our lobbying activities about the cost, complexity, and opportunity for market distortion which the regulations will inevitably give rise to.

3. Two conservative MPs (Piers Merchant, Beckenham, and Sir Roger Moate, Faversham) complained about the large amounts of detailed data which companies are required to collate in order to comply with the regulations, and that the cost and complexity of gathering the data would put a heavy burden on companies, greater even than that of complying with VAT regulations. Sir Roger Moate said that there was a danger of creating a new artificial market for waste certificates. The system needs constant scrutiny, he said, to ensure that it leads to a free market solution and not to a costly corporatist burden on British industry.

4. On the subject of cost - the DoE has always maintained that the UK's regulations will deliver a low-cost scheme - the Minister referred to an overall cost to British industry to comply with the regulations of £270 million to £280 million. Conservative back benchers with in-depth knowledge of the industries involved put the compliance costs to British industry at between £300 million and £600 million with an upper limit of £1 billion.

4.1 This is in line with our own estimate of the costs to the ICL group of around £1 million within three years. This also underlines our earlier recommendation for the ICL group to reduce or eliminate plastics from its packaging portfolio as far as possible.

5. Michael Meacher, Oldham West, pointed out that HM Opposition strongly supports the principle of increased recovery and recycling of packaging waste but deplored the 'shambolic' way in which the issue had been handled by Secretary of State for the Environment. He said that the regulations will produce distortions in the packaging chain and put many companies at a serious competitive disadvantage.

His view is that the shared responsibility approach, unique to the UK in response to this EU Directive, has resulted in a complex and previously untried set of legal arrangements and obligations.

He pointed out that individual compliers (our chosen route) will, under the Government's regulations find it possible to obtain the necessary reprocessing certifications only at prohibitive prices.

6. Mr Meacher gave notice that an incoming Labour Government will seek an early review of the regulations, but that this would only be an interim solution to the problem, and that more important longer term problems need to be addressed urgently.

7. The longer term issues which needed solutions were also outlined by Mr Meacher. These included the following: the role of local authorities in packaging recovery and recycling; retailers' schemes threatening existing recycling infrastructures; the need to encourage waste minimisation, the problem of cross-subsidy.

7.1 It is significant that two of the key players in achieving the targets set out in the packaging regulations, local authorities and retailers, are key vertical markets for the ICL group. Account development in these areas should anticipate sectoral needs with regard to this environmental legislation and its on-going development.

8. Indications of how a Labour administration would change the regulations were also given during this debate. Mr. Meacher said that a split of targets might be introduced: a separate target for commercial and industrial waste and another for domestic waste (our preferred option), and also a regulation to positively encourage re-use of packaging.

He also touched on the low percentage of recovery and recycling in the regulations - slightly more than a quarter of all packaging, the minimum allowed under the EU directive, whilst Germany already recycles more than three-quarters of all its packaging and the Netherlands recycles half.

On the subject of reduction of packaging, Mr Meacher pointed out that over the past year, Germany has reduced packaging by 12 per cent.

8.1 This would indicate that we can expect to see more ambitious targets from a Labour Government, and a split of targets. We may also see targets introduced which would force businesses to reduce the amount of packaging they use.

9. Joan Ruddock, Lewisham, Deptford, pointed out that the regulations did nothing to create markets for recycled goods, nor had a mechanism for waste reduction. She called for the setting of post-consumer recycled quotas to ensure effective recycle markets.

9.1 This would indicate the possible introduction of a Labour regulation to stimulate the use of recycle, and once established as a principle could extend beyond packaging waste regulations to the next anticipated piece of waste management legislation, the recovery and recycling of electronics.

10. Both Joan Ruddock and Michael Meacher made the point that the Opposition would allow the regulations to go through unopposed but only because Britain is already late and well behind the rest of Europe in the amount of packaging that is currently recovered and recycled, and secondly because further delays in implementing some regulation would only increase uncertainty in industry.

The regulations were allowed through, Michael Meacher said, on the strict understanding that they will require urgent review; and

Joan Ruddock said they would not oppose the regulations because they know that in government they will be able to revise them in the interests of business and the community at large.

11. In summary: We must expect a Labour administration to revise the packaging regulations. We should bear in mind that new regulations could well include the following:

- * revised and higher targets for recovery and recycling;
- * sectoral targets;
- * targets to reduce total packaging used by sector, by industry or by company;
- * targets for re-use of packaging;
- * changes in activity obligation percentages within the packaging chain;
- * regulations to encourage end-use markets for recyclate;
- * changes to ensure that there is reprocessing capacity to match the total recovered tonnage and that reprocessing certificates are not prohibitively expensive.

There would also appear to be some unrest about the regulations on the Conservative back benches, especially amongst those MPs whose constituencies include industries who will be fundamentally affected by the implementation and cost of the regulations.

This would indicate that, whatever the outcome of the election, close scrutiny of the regulations will result in changes. We should continue to lobby and make representation to the EA and DoE with information from the lessons we learn in implementing our processes in the run-up to August 31st and compliance.

Joy Boyce
5. March 1997.

Report Number 1

Annex 6

Annex 6

EU Packaging Legislation Report, February 1997

EU Directive on Packaging and Packaging Waste

At the end of 1994 the EU passed a directive on packaging and packaging waste. This set out the framework of rules and targets within which EU member states were to create national strategies for dealing with packaging and packaging waste whilst ensuring that the free circulation of goods is not impeded. A deadline of 30th June 1996 was imposed by which time member states were to have implemented the directive or transposed it into national law. The directive's rules and targets obliged member states to:

- set up systems for the return and/or collection of packaging and packaging waste, and ensure its reuse and/or recovery;
- take the measures needed to achieve the directive's recovery and recycling targets - see targets below;
- see that packaging put on the market meets essential requirements, without creating trade barriers;
- adopt measures to prevent packaging waste;
- limit heavy metals in packaging;
- include specific actions on packaging and packaging waste in national waste management plans.

Targets

The directive requires each member state to recover a minimum of 50 per cent and a maximum of 65 percent by weight of total packaging waste by mid-2001, and to recycle between a minimum of 25 per cent and a maximum of 45 per cent by the same deadline.

At least 15 per cent of each type of packaging waste material must be recycled.

Energy recovery is not counted as recycling. Greece, Portugal and Ireland have until the end of 2005 to meet the recovery and recycling rates. But, even so, these three countries must achieve a recovery rate of at least 25 per cent by mid-2001.

Present Position

Only a small number of member states has achieved the EU's deadline of 30 June 1996 to implement the directive. The EU normally starts infringement proceedings against governments if they do not notify the EU executive of their national implementation measures within two to three months of the deadline for formal compliance.

Follow-up Directive on Marking of Packaging

There is a proposal for a follow-up directive which will lay down the rules on the marking of packaging and will establish a conformity assessment procedure.

The proposed follow-up packaging directive would ban the use on packaging of all logos intended to denote reusability or recyclability except those that it prescribes. It is reported that Sir Leon Brittan, the EU's commissioner for trade has objected that this will act as a barrier to imports from the rest of the world, and industry is in agreement with this view.

The Packaging and Packaging Waste Directive says that member states must ensure that a statistical database is set up so that progress towards meeting the national targets can be

monitored. A Commission Decision firming up the reporting requirements was formally adopted on 3 February 1997, whilst the Commission Decision on Material Identification was adopted by the Commission on 28 January, and both will come into force when published in the Official Journal.

Current Situation on Packaging in EU Member States

1. Austria

1.1 The Austrian government's packaging decree came into force in October 1993 and a revised version was adopted in 1995. It was amended again in November 1996 to bring it in line with the newly amended Waste Directive.

1.2 In its present form the decree sets an ultimate recovery/recycling target for all packaging waste of 80 per cent by volume, to be met by July 1999. This target is obligatory for all companies who have not joined Austria's packaging recovery organisation, Altstoff Recycling Austria (ARA).

1.3 For individual packaging materials, the decree sets recycling rates of 95% for ceramics and metal, 93% for glass, 90% for paper/cardboard, 40% for plastics, and 15% for composites, all to be met this year. The rate for composites goes up to 40% at the beginning of 1997. The decree allows for incineration with or without energy recovery, but only under the condition that the waste goes to hazardous-waste incinerators.

1.4 Final consumers who acquire packaging or packaged goods for use within their company must, unless otherwise exempted, get it recycled or reused. Unless registered as a large waste holder, they must join a collective scheme.

1.5 Packaging contaminated with hazardous waste, non-packaging waste or food service disposables may only be introduced into collection and recovery systems if the

operator of the system expressly permits it. The obligations set out in the Ordinance do not apply to deposit-bearing packaging and pallets intended for reuse, and any closures and labels attached to them which together do not account for more than 5% by weight of the reusable container.

1.6 The 1990 Waste Management Law is the framework on which the Packaging Ordinance is based. An amendment to the Law was adopted in August 1996 to bring Austria into line with EU waste rules and to update it through references to ecocycles. The new law establishes rules for Collection and Recovery Systems.

1.7 A further ordinance will be introduced setting out conditions and criteria for the establishment and operation of recovery systems. This will include efficiency criteria, collection and recovery targets, and demarcation criteria for existing systems.

1.8 The amendment to the Waste Management Law solves the problem of the 1995 Constitutional Court ruling, on not allowing the objectives ordinance and other legislation to cover the same subject, by making an exception for packaging.

2. Belgium

2.1 Waste management policy is a regional responsibility in Belgium, so to coordinate policy a “standardising” Cooperation Agreement has just been adopted by the three regions and enacted as an Inter-regional decree after notification to Brussels. The agreement aims to guarantee that the market share of reusable packaging for the same product does not decrease compared with the previous year and that the proportion of non-reusable packaging for the same packaged goods is reduced compared with the previous year.

2.2 Regarding recovery and material recycling rates and the timetable, the agreement is stricter than the EU directive. The targets set must be achieved in each Region and both for household and industrial waste.

2.3 In 1996 50% of packaging on the Belgian market had to be recovered and 35% recycled. For 1997 the rates are 60% and 40%; for 1998 70% and 45%; and for 1999, 80% and 50%. Rates for the following years will be set in 1999. Each material must reach recycling rate by 1 January 1998, and this must be achieved separately for both industrial and household packaging waste.

2.4 The agreement requires industry to draw up packaging waste prevention plans including measures to increase reusable and recyclable packaging and to reduce one-way packaging. It introduces a general take-back obligation.

2.5 For consumer packaging, this requirement is increasingly being discharged by Fost Plus, an organisation set up by packaging chain members in 1993. Fost Plus has negotiated contracts with a number of public agencies and local authorities in the three regions and plans to steadily expand its geographical coverage.

3. Denmark

3.1 According to a Danish environment ministry official, Denmark believes it has transposed the packaging directive into national law. The only problem it expects to encounter is its controversial ban on beverage cans, which it plans to loosen by opening the Danish market to aluminium cans as an alternative to bottles, although steel cans would remain banned. Commission officials say a ban on any particular type of packaging might be incompatible with the EU directive.

3.2 Transport packaging: a voluntary agreement signed last year by industry and the environment minister calls for 80% of transport packaging to be recycled. This

agreement is now becoming law and thus will oblige municipalities to collect transport packaging.

3.3 National monitoring body: Danish environment agency to establish a national monitoring body for packaging waste management but is waiting for EU standards on statistics and material identification before doing so.

3.4 Denmark is the only country to have given specific targets for plastics. Industrial and commercial packaging recycling targets are as follows: paper and board will rise from 62% in 1994 to 80% by 1998; by 1997, PP is to reach 40%, LDPE and EPS 50% and HDPE 70%; by 2000, all these plastics materials are to reach 80%. The plastics targets are provisional as there are at present no viable technologies to achieve all to them.

Key

EPS	Expanded Polystyrene
PP	Polypropylene
LDPE	Low Density Polyethylene
HDPE	High Density Polyethylene

4. Finland

4.1 Finnish environment ministry has proposed changes in national waste management law to bring Finland's legislation in line with the EU packaging directive.

4.2 Proposals submitted to European Commission (but not adopted by Finnish cabinet and parliament before autumn 1996) include producer/importer responsibility and significant increase in reuse and recycling rates for packaging waste.

4.3 From beginning of 1997 producers and importers are responsible for reducing packaging waste and raising reuse and recycling levels - at present consumers and municipalities hold this responsibility.

4.4 Discussions on the targets were completed in June 1996. By 2001, packaging recycling was scheduled to increase from 30% to 42% and energy recovery from 12% to 19%. Material-specific targets were also given.

4.5 Producers of packaging will also be required to ensure that the ratio of packaging waste to packaging placed on the market is at least 6% lower (by weight) by 30 June 2001, than it was in 1994.

4.6 By July 2001, at least 82% by weight of packaging placed on the market is reused or recovered or recycled; at least 75% of fibre-based packaging by weight is recovered and 53% recycled; at least 48% of glass and 25% of metals is recycled; at least 15% of plastics is recycled and energy from a further 30 % recovered.

5.0 France

5.1 Has two pieces of legislation in place which it considers meet the requirements of the EU packaging directive: one for household packaging, other for packaging waste from businesses and industry.

5.2 1992 Household packaging decree makes municipal authorities responsible for collection and sorting packaging waste (together with other household waste) but obliges manufacturers, importers and distributors to arrange for the recovery of the separate packaging materials.

5.3 Industry can do this either by setting up their own system or by participating in a joint recovery organisation. Three such organisations exist in France. The most

important, Eco-Emballages, handles all kinds of packaging. Eco Emballages' Green Dot mark can currently be found on 90% of consumer products in France.

5.4 Non-household packaging waste, in particular transport packaging: a 1994 decree aims to achieve a 100% recovery rate by imposing a take-back and recovery obligation on the final users of such packaging. A number of joint recovery organisations have been established but it is still too early to say whether they are making progress in moving towards the target.

5.5 Compliance with the Packaging and Packaging Waste Directive will be completed by a fourth measure, which will transpose the “essential requirements” and heavy metal limits of the Directive. The UK is expressing concern that by unilaterally pre-empting the eventual requirements of this Directive, France is creating a new trade barrier.

6. Germany

6.1 The amendment to Germany's 5-year old Packaging Ordinance was finally approved by the Federal Cabinet in November 1996. The text passed through the Bundestag unchanged in December and was notified to the EC. The amendment is intended to implement the European Directive, and the objectives and definitions in the Ordinance have been amended accordingly.

6.2 The amendment would introduce overall targets applicable to all categories of packaging for the first time, at the maximum rates permitted in the Directive (65% recovery and 45% recycling by 2001). Up to now only sales packaging recovered through Dual Systems (DSD) had to meet targets, but the amendment would bring within the new targets commercial and industrial packaging.

6.3 The targets are now based on quantities placed on the market, not on what is collected as in the original Ordinance. They will be, up to and from January 1998,

respectively; glass 70% and 75%, tinsplate 70% and 70%, aluminium 50% and 60%, paper/ board 60% and 70%, composites 50% and 60%, and plastics 50% and 60% (40% of which must be met by mechanical recycling as opposed to feedstock).

6.4 If the DSD collects more than it needs to meet its recycling target and wants to landfill the surplus, it must pay local authorities to remove it at commercial waste rates.

6.5 Packaging with hazardous residues will be brought within the scope of the Ordinance. With effect from 1 January 1999, such packaging must be taken back and recycled if technically possible and economically reasonable.

7. Greece

7.1 There has been no movement since the recent elections, and in the absence of any notification, the European Commission has begun infringement proceedings. The committee set up by the Environment Ministry to work on a draft law to implement the European Directive still has three proposals before it. The Ministry's proposals build upon enabling provisions of an Environmental Protection Law of 1986.

7.2 The new proposal would set a target of 30% recovery by the end of 1997 (the European Directive allowed Greece to aim for 25% recovery by mid-2001). The proposal also includes a minimum target which the Directive envisages for the end of 2005 - 50% recovery and 25% recycling, with no material recycled at less than 15%.

7.3 A new public organisation is to be set up to plan, monitor and license recycling organisations established by the packaging chain. It will also promote recycling, granting and monitoring use of a special recycling symbol. This public body is to be financed by means of a packaging fee.

7.4 Industry would be allowed to form recycling organisations to which the legal responsibility of individual companies could be delegated. These recycling organisations could make their own decisions about agreements with local authorities, use or otherwise of the “Green Dot” etc.

7.5 Industry’s counter-proposal is based on the concepts of local authorities remaining responsible for collecting municipal solid waste, with manufacturers, retailers and consumers funding the additional costs of separate collection and sorting.

7.6 Packer/fillers and importers of packaged goods would either operate their own collection systems or would delegate responsibility to the Organisations for Packaging Valorisation (OPV), which would be officially licensed for 6 years. The system would be supervised by a Committee for Waste Management.

7.7 Industry is united behind this alternative, and since the Environment Minister has not yet endorsed any of the proposals, the outcome is not yet clear.

8.0 Ireland

8.1 The government’s specific recovery target for packaging - set out in Recycling for Ireland, its strategy document, but not in the Act itself is 33% (55% for glass and 25% for the other materials). Primary responsibility for operating and funding return and collection systems will lie with producers, importers, distributors and retailers.

8.2 The Irish Business and Employers Confederation (IBEC) launched its proposal on a packaging waste recovery and recycling plan in February 1996. Due to the high costs involved, it recommended sticking to an overall target of 25% recycling for the five years to 2001, as provided for in Ireland’s derogation of the European Directive.

8.3 The draft regulations have been completed and will provide for REPAK, Ireland's recovery obligation, or other organisations to be approved if they meet the criteria laid down. Packers and importers who do not join a recovery organisation will have to register with the enforcement authorities and the draft Regulations would have required them to take back used packaging equivalent to 100% of what they have placed on the market.

8.4 Ireland has not yet notified any text to Brussels, and the Commission has begun infringement proceedings. Draft Regulations have been held up for resolution of contentious issues, notably the exemption threshold.

8.5 Italy

8.1 A decree implementing the EU Packaging and Packaging Waste Directive was adopted on 30th December 1996. Sectoral consortia will be set up to manage packaging and packaging waste - packaging manufacturers as well as packer/fillers and distributors will be involved. Used consumer packaging will be collected by the local authorities, but will be banned from landfill.

8.2 Within 12 months, the regions are to draw up waste minimisation and recovery plans. In cases of "protracted inactivity" the Environment Ministry will take action to introduce measures as a substitute for a regional plan, or to act if the authorities fail to implement the regional plan.

8.3 Every local authority must ensure the separate collection of 15% of municipal waste within two years, 25% within four years and 35% within six years. Packaging producers and users of packaging must submit annual data from 1998 on the tonnages of packaging material placed on the market, reused and recycled.

8.4 Producers and users of packaging are responsible for its environmental management and for the taking-back of primary and other packaging waste collected by the public authorities. A National Packaging Consortium is to be set up for this purpose.

8.5 For waste outside the public system, secondary and tertiary packaging waste, producers and users of packaging have a choice between joining one of the consortia as laid down in the Decree, establishing a deposit scheme or organising their own independent collection, reuse, recycling and recovery of packaging waste.

8.6 If they do not join a consortium they must prove to the Observatory that they have adopted equivalent measures, send the National Packaging Consortium their own specific programme, and report annually to the Observatory on the results.

8.7 Packaging users must take back used secondary and tertiary packaging free of charge and send it to a collection point organised by the producer. Producers and users will be responsible for the costs of taking-back used packaging and collecting secondary and tertiary packaging waste, separate collection of packaging waste from the public authorities, reuse of used packaging, recycling and recovery of packaging waste and the disposal of secondary and tertiary packaging waste. Costs must be passed on to the consumer.

8.8 To meet the overall recovery and recycling targets and to liaise with the public authorities' collection activities, producers and users of packaging will set up a joint National Packaging Consortium, to be known as Conai.

8.9 Targets are laid out in the same way as in the European Directive. The General Prevention Programme will determine the final and interim targets to be attained. The landfilling of packaging and recovered containers is banned, with the exception of waste derived from sorting, recycling and recovery operations.

8.10 Packaging producers and users who fail to fulfill their obligations under the decree will be punished by a fine of up to 90 million lire (£35,000). The landfilling of used or recovered packaging will be punished by a fine of up to 60 million lire.

9. Luxembourg

9.1 In 1991 a “Convention” was agreed between the authorities and industry to implement the EC Liquid Food Containers Directive. This was to be updated and strengthened through a new law on liquid food containers which would provide for eco-taxes, but this was withdrawn in August 1995. The Council of State rejected it on the grounds that its scope was too limited because it applied only to beverage containers whereas the Packaging Directive applies to all packaging.

9.2 Luxembourg has promised the European Commission that it will soon be notifying draft legislation covering all packaging, despite the disagreements within the Government on how to proceed.

10. Netherlands

10.1 The Dutch draft Regulations define targets at the upper level provided for in the European Directive, and require them to be met by October 1997. Local authorities will carry out and fund the separate collection of used packaging from households. Industry’s financial responsibility starts from where the local authorities’ responsibility ends. End-users of commercial/industrial packaging will be responsible for the costs associated with disposal.

10.2 The legal obligation to meet the targets will fall on packer/fillers and importers, but everybody in the packaging chain must contribute to the achievement of the packer/filler’s obligation. They can fulfill their obligations through a collective organisation, through a covenant, or through individual compliance.

10.3 Producers and importers must report every 3 years on the measures taken, contribution from other parts of the packaging chain and the results. The EC has questioned some definitions used and the obligations for point of sale packaging. The government's subsequent response will not be in the form of a new version of the regulations until the Covenants have been agreed.

10.4 It is expected that the Regulations will come into force in April and Covenants notified to Brussels for the three-month scrutiny period, with the Covenants coming into force in August.

11. Norway

11.1 Industry has been allowed to come up with its own "producer responsibility" programme. Taxation will be avoided provided voluntary agreements are concluded and the recycling targets are met. In September 1995 binding agreements were concluded between the Environment Ministry and packaging manufacturers.

11.2 Agreements were reached on the following recovery and recycling targets respectively, to be met by 1999, corrugated board 80% and 65%, cardboard 60% and 50%, expanded polystyrene 60% and 50%, other plastics 80% and 30%, metals 60% recycled, and beverage cartons 60% recycled.

11.3 The Environment Ministry wrote to the EFTA Surveillance Authority in July 1996 explaining how it proposes to implement the European Packaging and Packaging Waste Directive. Industry has set up recovery systems to meet the targets. The systems are monitored by a committee and are funded from a voluntary levy on packaging producers, packer/fillers, importers and retailers. There are no specific taxes on landfill and/or incineration.

12. Portugal

12.1 The decree for implementation of the Packaging and Packaging Waste Law was published on 29 July 1996. The Decree enabling law came into force in June 1996. Since both came into force before being notified to Brussels, both were invalid. The commission began infringement proceedings, and Portugal responded by forwarding two draft texts on 3 January - the laws already adopted.

12.2 The Decree-Law creates two packaging waste management systems (a deposit system and an “integrated system”), establishes targets and timetables and sets up a supervisory commission. The packaging chain’s responsibility is to fund the additional costs associated with the separate collection and sorting of packaging waste. This will be done through contracts or voluntary agreements with the local authorities who actually do the collecting and sorting, and by guaranteeing take-back and valorisation of the collected used packaging.

12.3 Packer/fillers and importers of packaged goods must either set up a refundable deposit system or join an integrated system where the responsibility for managing packaging waste is passed to an approved organisation. The approved organisation will be given a three year licence and will bear the additional costs of packaging waste management.

12.4 Packaging converters and raw material producers are responsible for valorising the packaging waste fraction of municipal waste, either by themselves or by arranging for material organisations to be set up for that purpose.

12.5 End-users are responsible for the valorisation of commercial/industrial packaging. The new legislation reproduces many of the provisions of the European Directive, including the targets - minimum 25% overall valorisation by the end of 2001, and by the

end of 2005 at least 50% valorisation, 25% recycling and 15% recycling for any one material.

12.6 A follow-up committee, CAGERE, is to be set up to supervise implementation of the law and will be chaired by an Environment Ministry representative. A “Green Dot” organisation, Sociedade Ponto Verde (PSV), was started up in November 1996 and will be funded by licence fees on packer/fillers and importers which will be collected from January 1998.

13. Spain

13.1 After many amendments, the text of a Royal Decree-Law was finalised in August and the draft notified to Brussels. There is an obligation to reduce the amount of packaging waste produced, by 10% over five years and there are now interim targets (within 36 months, overall recycling rate of 15% and a minimum of 10% recycling of each material).

13.2 The draft provides for mandatory deposits, take-back and recovery obligations to be imposed on manufacturers and distributors, unless they join an integrated system which guarantees fulfilment of the targets. The targets are those in the EU Directive.

13.3 Local authorities not in partnership with an integrated system will agree with the Autonomous Region on how the recovery and recycling targets shall be met. Integrated systems will be financed by a levy on packers and fillers covering each new packaged product. Payment of this levy (which is tax-free) entitles the packer to use the integrated system’s special certification symbol.

13.4 The final holder of packaging waste and used packaging must deliver it to an authorised recoveror or recycler or to a company which can reuse it. If nobody is willing

to accept it, the manufacturer or importer of the packaging is legally obliged to take responsibility for it.

13.5 Within a year of the Decree-Law coming into force, the Government is to establish a National Programme for Packaging Waste and Used Packaging to integrate the programmes drafted by the Autonomous Regions. The new recovery organisation, Ecoembalajes, was formally started on the 22nd November 1996.

14. Sweden

14.1 The Ordinance on Producer Responsibility for Packaging has been in force since October 1994. To implement the European Directive, there will be an amended Decree on producer responsibility for packaging.

14.2 These amendments involve a Decree on maximum permitted concentrations of certain heavy metals in packaging and an amendment to the Decree on cadmium. Drafts of these measures have been notified to Brussels.

14.3 Under the Ordinance on Producer Responsibility for Packaging energy recovery is acceptable but does not count towards achievement of the targets. Incineration plants must now have energy recovery facilities. All producers in the packaging chain must facilitate recovery of used packaging from consumers and other end-users.

14.2 Under the Ordinance on Producer Responsibility for Packaging, existing laws on beverage containers and other material targets will remain for the period from January 1997 to 29 June 2001, but from 30 June 2001 the following targets must be achieved:-

	Recovery	Material recycling
Aluminium and steel (except beverage cans)	70%	
Glass		70%
Corrugated	65%	
Other paper and board	70%	40%
Plastics (except PET for carbonates)	70%	30%
Wood	70%	15%
Other material	30%	15%

15. Switzerland

15.1 An amendment to the Environmental Protection Law will come into force on 1 July 1997. The amendment incorporates the “waste management hierarchy”, the “proximity principle” and the “polluter pays principle”. It introduces a number of provisions including product stewardship, such as powers to ban single-use products (such as packaging), to impose mandatory deposits, or to mandate minimum recycled content.

15.2 It also empowers the authorities to levy a charge on manufacturers and importers to fund valorisation, or to require valorisable waste to be handled in a particular way or to be separated before being handed over for disposal.

15.3 It is the Environment Ministry’s intention to hold these powers in reserve for use if industry fails to put its own voluntary “producer responsibility” systems in place, and there are no plans to use these enabling powers to introduce measures affecting packaging.

16. United Kingdom

16.1 The UK has opted for a completely different approach from every other member state. Instead of encouraging collection and sorting and offering a take-back guarantee, the UK is aiming for material to be pulled through by the reprocessors.

16.2 Changes to the Government's proposals as a result of the consultation process were announced on the 18th December to the House of Commons. The draft regulations were laid before Parliament on 29th January 1997 and will be subject to an affirmative resolution i.e. they can be accepted or rejected but not amended. The regulations were agreed by the House of Commons on 3rd March 1997.

16.3 Every supplier of packaging in the chain will have to obtain certificates (or join a collective scheme so that they get it for them) to show that an appropriate tonnage of material has been reprocessed on his behalf. Surplus certificates can be traded, and the idea is that the resale value of the certificates will give reprocessors a further incentive to expand capacity.

16.4 There will be no obligation on packaging end-users as such and obligations would fall only on companies in the packaging supply chain. The UK's obligations will be heavily data-dependent, so in 1997 only the registration and reporting requirements will take effect. Companies opting for individual compliance and collective schemes must register with the Environment Agency and pay its annual fee (£750), and inform the Agency of the tonnage of packaging handled, recovered and recycled the previous year.

16.5 For three years from 1998 interim targets must be met, and requires sending the Agency evidence of compliance - the "reprocessing certificate". The final targets take effect in 2001. The targets will be as follows:

	Min. recycling rate for each material	Overall recovery target
1998	7%	38%
1999	7%	38%
2000	11%	43%
2001	16%	52%

16.6 It has been decided to require separate reporting and targets for aluminium and steel packaging. The 16% minimum recycling rate also applies to wood and other packaging materials from 2000 onwards, but wood is included in the reporting requirements from 1997.

16.7 Legal responsibility for meeting the targets is divided between raw material producers with 6% obligation, convertors (11%), packer/fillers (36%), sellers (47%) and importers (who pick up any obligation from activities that have occurred outside the UK). If more than one company is involved in the conversion stage the last company involved at that stage picks up the obligation.

16.8 There will be a duty on every company “handling “ more than 50tonnes of packaging per year and with a turnover above £5m (until 2000 when the threshold value is £1m). An importer picks up 100% obligation for all transport packaging. Exports from the UK will be excluded form the obligations.

16.9 Companies must, by 31st August 1997 and annually from 1 April 1998, firstly register with the Environment Agency and pay its fee, and secondly return a form to the Agency showing the tonnage of packaging handled the previous year, and the tonnage it recovered and recycled the previous year. From 31st January 1999 companies must send

the Agency evidence of compliance showing the company has met its share of the obligation for the targets set for the previous year.

16.10 Companies have the option of joining an exemption scheme and delegating their obligations to it. Essentially, the scheme's obligations are the aggregated legal obligations of their members. The main scheme is likely to be Valpak and because the Government is keen that it should not have a monopoly, it will allow groups of companies, material sectors or product sectors to set up their own exemption schemes. Companies joining an exemption scheme will have to submit exactly the same data to Valpak as they would have sent to the Agency if they had opted for individual compliance.

16.11 Reusable packaging will be subject to recovery obligations when first placed on the market, but will not bear an obligation when subsequently reused. Packaging with hazardous content will not be subject to recovery obligations if the businesses handling it believe that it will fall within the definition of "special waste" when finally disposed of. However, they must still keep records of such packaging and must try to recover it as far as possible.

17. Northern Ireland

17.1 The enabling legislation within the Environment Act 1995 does not apply to Northern Ireland. The proposals to implement the European Directive also omit Northern Ireland. A consultation paper on producer responsibility for packaging waste in Northern Ireland was published on 28th November 1996. It discusses both the British approach and the approaches of other EC countries.

17.2 The same percentage obligations and threshold value is proposed as in Great Britain. In the absence of an Environment Agency in Northern Ireland, registration

would be with the Environment and Heritage Service of the Department of the Environment for Northern Ireland.

17.3 It is proposed to introduce an Order in Council which would give the Department of the Environment Northern Ireland (DoENI) powers to make regulations to place shared producer responsibility on businesses. This Council is envisaged to be in place by June 1998 and companies would then have to start complying with the Regulations from January 1999.

18. Croatia

18.1 Packaging Waste Management Regulations were promulgated in June 1996 and came into force 8 days after publication. They incorporate heavy metal limits, data-gathering requirements, marking systems for plastic and composites and other features of the EC Directive.

18.2 Disposal of packaging waste will be restricted to residues from recycling or recovery processes, or packaging which cannot be processed cost-effectively. The Regulations require packer/fillers to arrange for the separate collection of used packaging at or near retailing outlets or in residential areas and for recycling or energy recovery from the collected material. Packer/fillers may delegate their separate collection obligations to an approved organisation.

18.4 The targets are expressed as a volume rather than as a percentage of the tonnage placed on the market. For paper & board 80,000m³ per annum, glass 60,000m³ per annum, plastics 2,000m³ per annum, metals 2,000m³ per annum, composites 500m³ per annum, and wood 500m³ per annum. These mandatory collection volumes are to be revised annually by the Environment Ministry.

19. Czech Republic

19.1 The 1994-6 Environmental Action Programme is in line with EU policy in terms of its principles and goals. An enabling law which will impose a take-back obligation on packaging manufacturers and packer/fillers from the year 2000 has passed its Second Reading in Parliament and will be adopted early in March.

19.2 The Government expects industry to start operating a recovery system in 1997 which will expand to take over the take-back obligations by 2000. The EKOKOM recovery organisation has duly been established, although it will not be using the “Green Dot”. Its 1997 fees, charged to packer/fillers and convertors, will be based on the number of packaging units placed on the market. It is hoped eventually to bring retailers into the system.

20. Slovenia

20.1 The Environment Ministry has subcontracted to consultants the task of preparing a national waste management programme. This will be divided into three parts, on industrial waste, municipal waste and packaging, and a working party has been appointed to draw up packaging legislation once the national programme is complete.

20.2 A draft report entitled “strategic guidelines for waste management in Slovenia”, that adopts the philosophy of the EU’s 5th Environmental Action Programme, and is currently being considered. It recommends reducing landfilling by 40% by 2000 and 60% by 2010, and increasing recycling and energy recovery by 48% by 2000 and 78% by 2010.

21. Estonia

21.1 A framework packaging law adopted in May 1995 sets out basic principles for packaging and packaging waste aimed at promoting recycling and recovery, minimising environmental damage from packaging waste, and harmonising Estonian law with international requirements.

21.2 The law closely follows the European Directive with additional requirements on labelling, markings and compositional rules. Packaging not meeting these requirements will be banned from January 1999. The law requires information on the contents of the pack, and special marking of hazardous contents, material identification and information on reusability and recycled content. Packaging may be marked with the Estonian eco-label, which can be awarded to goods or packaging.

21.3 Targets set are: reuse/recovery 60%, recycling 35%, both by 30 June 2001. A take-back obligation similar to the German Packaging Ordinance is imposed on manufacturers and sellers of sales, grouping and transport packaging of goods manufactured or commissioned by them. The take-back obligation is limited to a specified list of recoverable packaging. The obligations do not apply to small packs defined as having a volume less than 200ml or weighing less than 10g, nor to packaging of hazardous contents.

21.4 Deposits will be fixed for packaging on the list of returnable packaging regulated by the Government, and a packaging tax will be levied on one-way packaging at rates determined by the Packaging Excise Law. Neither is to be imposed on reusable packaging or where additional charges would not be feasible.

22. Russia

22.1 The government has drafted a law on solid waste which would establish general principles but no detailed rules. Progress on the bill was delayed until after the June 1996 Presidential elections. The amendments due on the Environmental Protection Act, which may contain provisions on packaging waste management, were also delayed by the elections.

22.2 The packaging chain has formed an organisation unofficially called RICPEN, which operates under the Packaging Association.

23. Hungary

23.1 The Act on an Environment Product Fee for packaging materials came into force in January 1996. The fee applies to “waste producing products”. Fees will be paid by the first distributor, user or importer, according to weight and type of material. The packaging fee is weight-based - 10 forint per kg.

23.2 Packer/fillers, distributors and importers, individually or through membership of a recovery organisation, may obtain a partial exemption if the material is reused or valorised or a full exemption if certain targets are reached.

23.3 Targets are: for paper, 30% in 1996, 45% in 1997; for glass, 20% in 1996, 35% in 1997; for other materials, 12.5% for 1996, 25% in 1997. The packaging chain association HAPAC is working on the creation of a packaging recovery system: Coopers and Lybrand have prepared a report.

23.4 The Act on an Environment Product Fee provides for automatic cancellation of the product fee on packaging materials when new packaging waste legislation comes into

force. A Waste Management Act is being drafted and no changes to the packaging legislation is expected until the act is in place.

24. Romania

A Regulation on the collection, recycling and reuse of all waste materials has been published. The Regulation obliges local authorities to introduce separate collection of recyclables from the domestic waste stream.

25. Turkey

The regulations set up so far have been for beverages and food packaging. The legal framework is now being restructured in order to form a national packaging waste management organisation in line with the principles of shared responsibility between industry and local authorities. The industry organisation CEVKO, set up in 1991, has established buy-back centres to build markets for used packaging materials.

26. Latvia

26.1 The Ministry of Economy's 1996-8 Public investment Programme (May 1996) lays out Latvia's waste management policy. Environmentally hazardous packaging comes under the Natural Resources Tax Law which came into force in January 1996. The tax is in the form of a fee for the licence on the activities involved.

26.2 The law has now been amended and the tax now covers packaging for all consumer goods. There are four options for how the tax can be assessed and paid: per kg of packaging material, per litre or kg of packed product, as % of package value, or as % of product wholesale price. The rates for non-food packaging are slightly higher than food packaging.

27. Lithuania

Before the 1996 elections there was talk of packaging legislation being introduced, but the change of government meant it was brought to a halt.

28. Poland

28.1 An excise tax on plastic packaging came into force in July 1995 and, after a review at the end of 1995, was brought within the general excise regime which now applies to all plastics applications.

28.2 A draft Waste Law is under consideration in Parliament. As submitted to Parliament, the text made it clear that packaging waste was industry's responsibility. However, household packaging waste management is a local authority responsibility, under the Maintaining Cleanliness and Order in Municipalities Law.

28.3 The Joint Session is still discussing the tax incentives for waste recycling in the draft law, and the Finance Ministry wants to insert restrictions to prevent opportunities for tax evasion. A landfill tax has also been proposed, targeted at industrial waste.

28.4 Other features include permission for a "waste producing activity" to be pursued, a general reference to mandatory minimum recycled content, and tighter marking and material identification rules.

28.5 Packaging manufacturers and importers of packaging or packaged goods would have to ensure multiple use of packaging where feasible, or otherwise ensure recovery. The environmental protection inspectorship would have the right to halt production if the duty is not complied with. The import of one-way packaging covered by a manufacturing

or import prohibition, or failure to ensure the recovery of packaging imported under a proper permission, would be a criminal offence.

28.6 EKO-PAK, which was registered in July 1995, has been lobbying for amendments to the draft Waste Law to include the principle of shared responsibility and provisions for exemptions. It has also proposed the creation of a Waste Management Council to advise ministers and take part in the preparation of a long-term waste management strategy. Its model is Turkey rather than the “Green Dot” systems of the West.

29. Slovakia

29.1 In October 1994 the Environment Ministry announced its intention of preparing packaging legislation as an amendment to the Slovak Waste Law. The intention was to copy the take-back provisions in the German Packaging Ordinance, only if reuse was not possible, was energy recovery to be allowed.

29.2 The government intends to take powers to ban types of packaging which generate unreasonable quantities of waste or which make recovery more difficult. The targets were discussed for five years after adoption, 60% by weight must be designed for reuse and 40% recycled. For ten years after adoption, these would be raised to 90% and 60%. This legislation would not apply to packages smaller than 100ml or flexible packaging with a surface area less than 0.1m², or to packaging with hazardous contents.

29.3 The industry organisation, SLICPEN, was invited to produce a report by 15 December 1995 proposing a national packaging waste management system and detailed legislation for implementation. The report recommended concentrating on materials which are either major components of the waste stream or have high potential value as secondary raw materials, and to set up an organisation to collect money from packers/importers to support collection and sorting. It also recommended that a Packaging Waste Management Council be set up, and that it sets targets for two to three year phases to

increase the recovery rate in steps, in order to match those set for Greece, Ireland and Portugal.

29.4 The Environment Ministry's work on packaging legislation has been delayed because framework rules for all waste are now being developed. Meanwhile the Environment Ministry has issued a call for tenders to finalise the principles of the Waste Law. The essential principles underlying Slovak packaging legislation are now scheduled to be established by April.

30. Ukraine

A draft waste law includes a reference to packaging waste, but no specific proposals. A packaging law has been drafted which would impose fees for non-biodegradable packaging.

Report Number 1

Annex 7

Annex 7:

Contaminated Land

Section 57 of the Environment Act 1995 amends the Environmental Protection Act 1990, to provide a system of control for contaminated land based on principles contained in draft guidance published in May 1995. The guidance states "there remains a need for a system of regulation and control of land affected by past contamination where the land cannot be regarded as suitable for its present use and which is not dealt with by other regimes".

The duties of the Environment Agency include regulation of the remediation of contaminated land designated as special sites. The contaminated land provisions introduced by the 1995 Act form a new Part IIA of the EPA 1990. The principal features of these new provisions are:

1. Local authorities will have duties to inspect their areas from time to time for "contaminated land".
2. Not all land that is contaminated will be treated as "contaminated land" for the purposes of the legislation. The decision as to whether or not land is "contaminated land" will be determined in accordance with detailed guidance, but will depend primarily on the degree of risk of harm or potential harm associated with the land (having regard to its use at the time).
3. Certain categories of contaminated land will be designated as "special sites" and fall under the jurisdiction of the Agency.
4. Once land is determined to be "contaminated land", there will be a formal consultation period of three months (except in emergencies) before the service of any remediation notice in respect of that land.
5. If the enforcing authority (i.e. the local authority or the Agency) is satisfied that sufficient remedial works are being carried out by the person(s), who would otherwise

be required to carry out the remediation work, then no remediation notice will be served.

6. The enforcing authority will also be obliged to take into account the issue of whether hardship would be posed to a proposed recipient of a remediation notice.
7. Notices requiring remedial works to be carried out may be served on the "appropriate person", i.e. either on the person(s) who *caused* or *knowingly* permitted the contamination or, where no such person can be found, on the *owner* or *occupier* of the land in question.
8. There will be rights of appeal against remediation notices.
9. Failure to comply with a remediation notice without *reasonable excuse* is a criminal offence.
10. Enforcing authorities will be able to carry out remedial works themselves in certain cases, and to recover their costs from the "appropriate person(s)".

Duties to Inspect

The new contaminated land provisions will for the first time place explicit duties on local authorities to inspect their areas from time to time in order to identify "contaminated land" (as defined in the legislation and subsidiary guidance), they are given duties and powers to require steps to be taken to assess and/or remedy the contamination and/or to ameliorate its effects.

What is "contaminated land"?

In the Act itself, "contaminated land" is defined as any land which appears to the local authority to be in such a condition, by reason of substances in, on or under the land, that:

- * significant harm is being caused or there is a significant possibility of such harm being caused; or

* pollution of "controlled waters" (basically, either surface or underground waters) is being, or is likely to be caused.

Local authorities will be required to act in accordance with guidance to be issued by the Secretary of State when determining whether land is "contaminated land". The draft guidance indicates that remediation of land will only be required where, as a result of the pollutants, the contamination presents unacceptable risks to human health, property or the environment, assessed in relation to the use of the land, or any other land which might be affected, and its wider environmental setting. The draft guidance also makes it clear that the definition and further considerations in the guidance only apply to the current use of the land.

The definitions of contaminated land in the Act is based on the identification of specific environmental risks, and the draft guidance states that for any such risks to be present, there must be:

- i) a source - i.e. the presence on the land of a substance, or substance, with the potential to cause harm or water pollution
- ii) a receptor or target - i.e. the presence of something which could be harmed by that pollutant or controlled waters which could be polluted; and
- iii) a pathway or a number of pathways - i.e. a means by which the receptor could be exposed to the pollutant.

Land will only be "contaminated land" if a relationship exists between these three elements (i.e. there is a "pollution linkage") and the harm or water pollution involved and the possibility or likelihood of the occurrence of these meets all other requirements of the statutory guidance.

In regard what harm is to be regarded as "significant", the draft guidance indicates that only the following categories of harm will be taken into account:

(a) chronic or acute toxic effect, serious injury or death to humans;

(b) irreversible or other adverse change in the functioning of an ecological system, in a location protected under the Wildlife and Countryside Act 1981, EC Directive 79/409/EEC on the conservation of wild birds or EC Directive 92/43 EEC on habitats;

(c) substantial damage to, or failure of, buildings, plant and equipment. For these purposes, "substantial damage" is to be regarded as occurring when the building, plant or equipment ceases to be capable of being used for the purpose for which it is intended;

(d) disease, other than physical damage to, or death of livestock or crops kept, reared or grown on the land in acquisition or adjacent land, such that there is a substantial loss in their value. For these purposes, "substantial loss" is to be regarded as occurring when the loss is more than 10% in value of the total value of the stock or crop on the land. Any such harm is, however, to be disregarded if it occurs where the stock or crop has been introduced to the land in the knowledge that the harmful effect might arise.

Landfills and waste deposits

Under the new legislation there will be no special treatment of closed landfills as distinct from other contaminated land. In regard to landfills which are the subject of existing waste management licences, the contaminated land provisions will not apply except to the extent that significant harm, or pollution of controlled waters, is attributable to causes other than a breach of the conditions of the licence or the carrying on, in accordance with the conditions of the licence, of any activity authorised by the licence.

Moreover, the Act provides that a remediation notice is not to be served in respect of land contaminated by reason of the deposit of waste, if and to the extent that it appears to the enforcing authority that the powers of a waste regulation authority or waste collection

authority may be exercised by way of requiring appropriate remediation in relation to that waste or the consequences of its deposit.

"Special Sites"

The Act provides that certain contaminated sites may be designated as a "special sites". The principal determining whether particular contaminated land merits designation as a special site is whether serious harm or serious pollution would or might be caused. The descriptions of types of contaminated land which will be dealt with as special sites will be set out in regulations. The draft outlines them as follows:

1a) Where contaminated land can affect drinking water supply - to cause failure of water to satisfy wholesomeness requirements of Part II of Water Supply Regulations 1989 or Part II of the Private Water Supplies Regulations 1991.

b) Controlled waters of major aquifer are being affected by contaminated land and any of the substances by reason of which the pollution of those waters is being or is likely to be fall within list Schedule [2]:

- * Organohalogen compounds and substances which may form such compounds in the aquatic environment.
- * Organophosphorous compounds
- * Organotin compounds
- * Carcinogenic, mutagenic or teratogenic properties in aquatic environment
- * Mercury and compounds
- * Cadmium and compounds
- * Mineral oil and Hydrocarbons
- * Cyanides

c) Controlled waters are being affected by the contaminated land resulting in them not meeting the criterion for classification set out in the Surface Waters (Dangerous Substances) (Classification) Regulations 1989 and the SW(DS)(C) Reg. 1992.

d) Contaminated land causes harm to or interference with a European site Reg10-Conservation, Regulations 1994-EU site

2. Contaminated Land as result of substances (in, on or under):

- * hexachlorocyclohexane (all isomers)
- * DDT (all isomers)
- * Pentachlorophenol and compounds
- * Hexachlorobenzene
- * Aldrin
- * Dieldrin
- * Endrin
- * Dichlorvos
- * 1,2 Dichloro[m]ethane
- * Atrazine
- * Simazine
- * Tributyl tin compounds
- * Triphenyl tin compounds
- * Trifluralin
- * Fenitrothion
- * Azinphos-methyl
- * Malathion
- * Endosulphan

3. Land occupied for purposes of Ministry of Defence

4. Nuclear site licensed land - under Nuclear Installations Act 1965

5. Land contaminated by reason of waste acid tars stored there in lagoons or bunds
6. Where activity of:
 - a) prescribed process designated for central control (authorised)
 - b) purification or refining of petroleum
 - c) manufacture or processing of explosives
7. Land adjoining 6. which is contaminated by escaped substances

Special sites will fall under the jurisdiction of the Agency rather than local authorities. According to the Act, a relevant factor in determining whether particular contaminated land should be designated as a special site is whether the Agency is likely to have expertise in dealing with the kind of significant harm, or pollution of waters, by reason of which the land is "contaminated land".

In most cases, the determination of whether or not land should be designated as "contaminated land", or indeed as a special site, will be up to the local authority in whose area the site is located, although the Agency will have the right to appeal against particular designations of land as special sites.

Appeals against remediation notices for special sites is to the Secretary of State for the Environment in England and Wales, rather than the magistrates court; and in Scotland to the Secretary of State for Scotland rather than to the sheriff.

Prescribed processes refer to designated IPC (Integrated Pollution Control) processes - designated under EPA Part I. Contaminated Land covers:

- 1) Land where activities under IPC authorisation have ceased
- 2) Land where activities are continuing but are non-IPC
- 3) Land where activities under IPC, but a remediation notice could nevertheless be served

Who is the "appropriate person"?

When "contaminated land" is located by a local authority within its area, the authority will be obliged to notify the Agency, the owner of the land, any person who appears to the local authority concerned to be in occupation of the land and each person who appears to be the "appropriate person". In the first instance, the "appropriate person" as defined in the Act is the person who caused or knowingly permitted the land to be contaminated. This is in keeping with the so-called "polluter pays" principle.

The meaning of the word 'caused' has been the subject of a great deal of judicial attention, particularly in relation to water pollution law, taking the reasoning in the leading case of *Alphacell v. Woodward* [1972] A.C. 824, as the basis for interpretation. In a recent case, *Attorney General's Reference No. 1 of 1994*, [1995] Env. L.R. 356, it was held (among other things) that it is entirely possible for more than one party to "cause" pollution even where the actions of each party were separate; and, moreover, a person may be guilty of causing pollution even where the actions of each party were separate; and, moreover, a person may be guilty of causing pollution where he participates in an active operation or chain of operations which result in the pollution. There has also been considerable judicial interpretation of the meaning of the words "knowingly permitting", and it is clear that liability can arise under this head where a person has knowledge (whether actual or constructive) of circumstances which might give rise to a polluting event, and has the power (whether physically or legally) to prevent it but fails to do so.

The Act specifically provides that a person may only be pursued to do by way of remediation things which are "to any extent referable" to contamination that he caused or knowingly permitted. Thus Person A, who was responsible for contaminating a site with substance X, could not be pursued to do things by way of remediation which are only referable to substance Y, the latter substance having been in the land as a result of the activities of Person B.

Report Number 1

Annex 8

Annex 8: Environmental Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of ICL After the Sale of the Manufacturing Arm

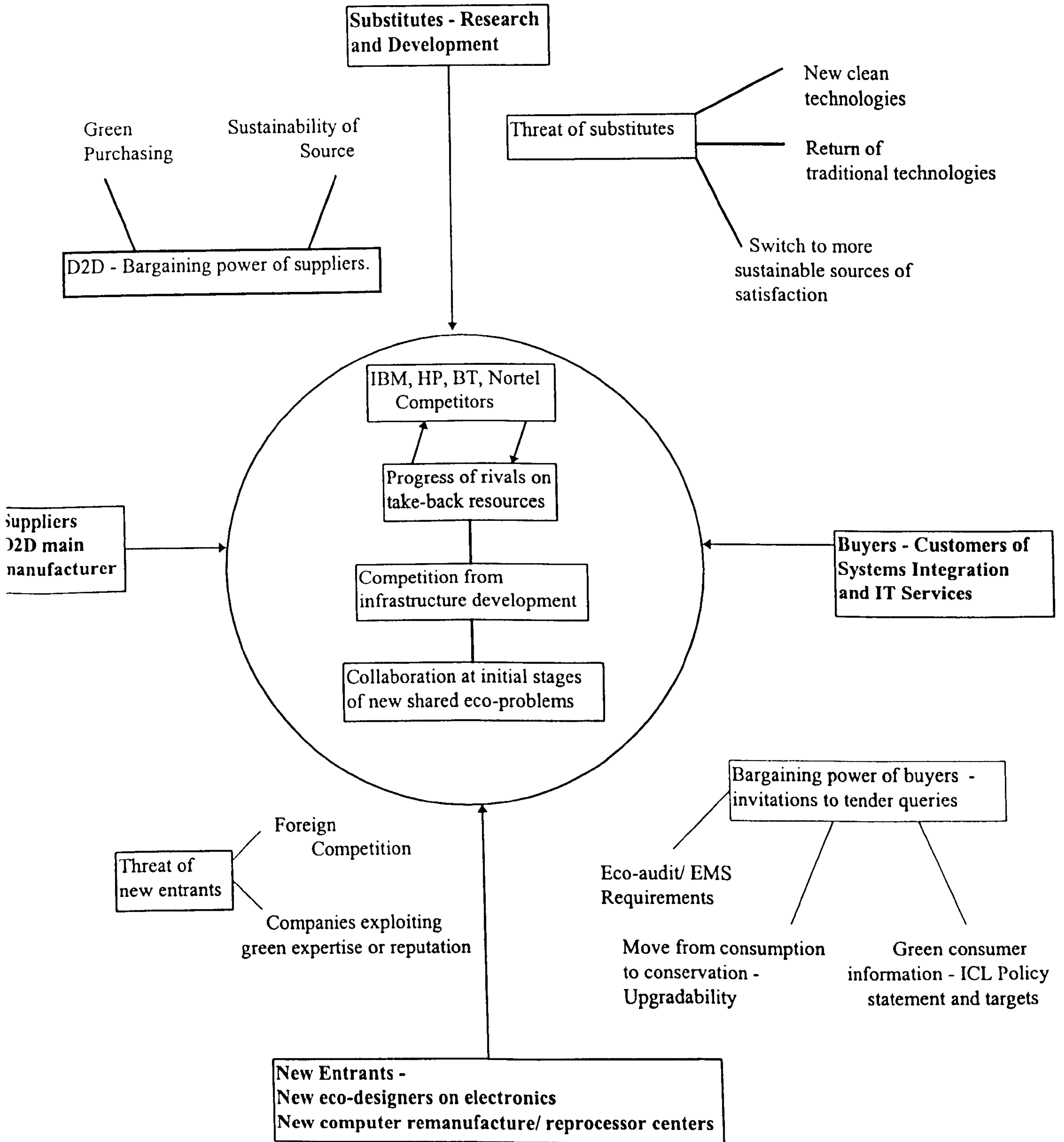
Recently ICL has sold its manufacturing arm to a Canadian company, Celestica. This promoted a proposal for writing an environmental SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of ICL after the sale of the manufacturing arm (Design to Distribution D2D). This looked at the relationship with the manufacturing arm and identified the impacts from the sale on ICL. It also looks at the external threats and opportunities arising from the metamorphosis from manufacturing to systems integration and services. This analysis looked at the effects on the marketing and supply pressures, environmental impacts, competitive issues and environmental expertise. A model of ICL's industry position was designed to aid the analysis. This shows its inputs and outputs, drivers and influences).

ICL Group Environmental SWOT Analysis of the D2D Sell-Off

Strengths	Weaknesses
1. Celestica is Canadian and therefore very environmental 2. ICL's new ability to control D2D as its supplier. 3. Manufacturing risks removed 4. Financial advantages 5. Risk of legislative problem removed	1. No ICL site is now ISO14001 certified. 2. Potential for D2D to increase prices to ICL for environmental services, especially as they understand well the legislative liabilities 3. Lack of control over recycling process. 4. Loss of revenue from recycled materials. 5. Loss of environmental expertise. 6. Lack of control over a major element of the supply chain 7. Lack of control over exactly what is recycled - e.g , will D2D decide they will not disassemble & recycle non-ICL kit, thus embarrassing us with customers who want us to remove mixed loads for recycling.
Opportunities	Threats
1. To increase environmental expertise via LCA and DfE, not previously covered by D2D. 2. Generic EMS is now more viable 3. Framework standard, use BSI, because it's cheaper (D2D used BVQI) 4. Sorbus to set up a recycling Facility	1. Loss of an environmental and economic reclaim and recycling channel for E-O-L IT systems. 2. Loss of environmental clean technology profile of the ICL group. 3. Inclusion of undesirable and hazardous substances in ICL marketed products. 4. Lack of control can mean threat of greater risk of environmental liability 5. Risk of premium pricing of environmental services by D2D. 6. Risk of D2D deciding they do not want to provide environmental services because it's no longer part of their portfolio.

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Industry Structure Analysis of ICL, it's Competitors and Suppliers



Minutes of the EngD meeting, 12th November 1996, Brunel University
Project at ICL: 'Total Environmental Information Requirements in a
Multinational Computer Company'

Attendees: Joy Boyce ICL plc, Gail Collins (RE), Chris France Brunel
University, Susan Grimes Brunel University

Next meeting date set: Friday 10th January 1997

Progress to Date

1. Data gathering for environmental reporting set up of external contacts project for recycling data.
2. ICL Sorbus disposition work: Itinery subassemblies/parts worth #100m, #30m of outdated equipment for disposal. Looked at hazardous components. Risks from Duty of Care
3. UK Packaging legislation implementation document.
4. Summary of BS7750 accreditation kit.
5. Research done on batteries and the special waste regulations. -
6. Energy questionnaire survey under the governments 'Making a Corporate Commitment Campaign' (MACC) and ICL environmental policy.

Work in Progress

1. Begun literary research on contaminated land regulations. Sue to set up meeting for Gail with Hilary Stone. Gail to talk to the EA and consultancies and to write up project as report. Investigation into site survey and risk analysis issues. Sue suggested to contact Robin Barnes.
2. Fujitsu Conference involvement and a report to be made including executive summary, contents, impacts & way forward.
3. Policy Framework involvement in order to achieve detailed education on ICL culture.
4. Write up ICL Sorbus disposition work with attention to the philosophy of the approach and detailing the types and quantities of materials concerned.
5. Write up project on UK Packaging Legislation.

Future Work

1. Practical based project on lead in printed circuit boards. Based at Brunel, supervised by Sue. 2 projects suggested:
* Pb recovery from PCBs * Pb replacement in PCBs
2. Design template development of environmental report.
3. Training material development. Video and workbook suggested for site facility managers. Generic EMS in mind.
4. Booklet on batteries to be written.

Other issues raised

1. Environmental Audit at an ICL site for EngD module training.
2. Packaging project budget and organisation.
3. Impending take-back legislation - within next year.
4. Hewlitt Packard discussed as a networking and benchmarking opportunity. Chris France commented on his experience with HP. Chris pointed out the importance of:
* Clear objectives/ goals for the project.
* The contribution to knowledge identifying 'the hole'.
* The relevance to environmental technology. Sue commented

that in this project management systems would provide the environmental technology aspect.

* The amalgamation of projects and the many changes in direction before the end result.

6. Approaches to combining academic and business aspects.

MINUTES OF SECOND MEETING

24th FEBRUARY 1997

Minutes of the EngD meeting, Monday 24th February 1997, Brunel University
Project at ICL: 'Total Environmental Information Requirements in a Multinational Computer Company'
Attendees: Joy Boyce ICL plc, Gail Collins (RE), Sue Grimes Brunel University
Next meeting date set: Thursday 24th April 1997

1.1

Joy suggested that information systems should be assessed, and efficiency comparisons made, both within ICL and bench-marked with systems in other companies.

Joy mentioned the possibilities of examining ethical management within the body shop case study.

Gail agreed and suggested that it could be another GC to tier to the research and that the Cooperative Bank gather may be another interesting company to look at. information.

Joy commented that all the case study companies in 1.1.2 have relationships with ICL and the work would be a useful bench-marking exercise.

Sue queried the research structure and Joy suggested Gail should undergo initial desk research with the information gathered already. Gail should also prepare a bench-marking project outline plan. GC

The second stage would be to set up visits/ interviews with the organisations. Joy will use her contacts to set up visits for Gail with IBM and BT. JB

Sue discussed the manageability of such a large project and the movement into other areas. Joy suggested the incorporation of the bench-marking exercise as a possible educational/ awareness tool within ICL. Joy would provide additional information on how other companies fit in as ICL customers/ suppliers for this purpose. JB

1.2

Joy described the need for defining ICL's environmental information needs from the CA viewpoint. Information on activities such as energy and recycling are only partially defined and waste isn't defined at all. Joy elaborated on the importance and difficulties in defining

exactly 'what we need to know'. An example of this being the PTT Tender where details of energy of manufacture vs energy for end of life recovery were questioned. JB will write a statement of definition to enable focus to the research.

JB

1.2.3

Joy mentioned the contact for the ICL Intranet development and the importance of survey feedback when developing the newsletter gateway e.g. instruction to press reply post if they found it interesting/ useful.

GC

1.2.5

Joy discussed two other points:

1. Costs of generic vs ISO 14001 certification Why? What are the benefits to justify these costs? The alternatives - e.g. a generic EMS for ICL sites in Europe being certified as a whole. If so, which sites? And how much replication is required?
2. The effects of differing cultures within the organisation on the adoption of a system, e.g. from a manufacturing site to an office site.

Sue queried the numbers of ICL sites. Joy replied that there are roughly 200 sites in the UK and 500 sites worldwide.

Joy mentioned the fact that one of the reasons why Celestica, a Canadian company, is buying D2D is because it is impressed with it's environmental profile.

1.3

Sue said she would speak to Lindsey Pepperal as Gail had not been able to contact him.

SG

Joy suggested that Gail should investigate and define a list of risk sites such as those at risk of attention from local councils. Joy also mentioned the site at Birmingham which is a high risk site. Joy suggested Gail should talk to ICL estates and said that ICL is building at Warrington and taking out new leases in Slough.

GC

Sue suggested Gail should talk to Robin Barnes. Sue also said she would seek contacts at local authorities in Bucks, Berks and Hillingdon.

SG

Joy suggested Gail should talk to Hugh Dalrymple from Health and Safety with regard to his involvement over warrington.

GC

2.0

2.1 should read:

Proposal for writing a SWOT analysis on ICL's environmental position after the sale of D2D.

Joy discussed some of the SWOT issues surrounding the D2D sell off. She suggested that it should be brainstormed at the next team meeting. JB & GC

Sue said the Industry Structure analysis diagram was a good start. Joy suggested Gail should annotate the diagram to begin a text surround. GC

Sue said to go through the literature search, executive summaries and overall six month report structure at the next academic supervisor meeting. SG & GC

The need for a project plan a month ahead was raised by Joy. GC

3.0

Joy talked Sue through the future work proposals at ICL. To be pursued at the next team meeting. JB & GC

4.0

Joy said the EngD Environmental Audit could be held at Slh06.

5.0

The date of the next meeting was set for Thursday 24th April 1997.

Report Number 2

‘The Role for Environmental Information Management’

Supervision:-

Academic: Dr. Sue Grimes, Brunel University

Industrial: Joy Boyce, Corporate Environmental Affairs Manager, ICL

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1. Abstract	2
2. Introduction	3
3. Report Summary	10
4. Conclusions and Future Work	13

**Annex 1: Packaging Legislation - ICL’s 1996 Data
Spreadsheets and Questionnaires**

**Annex 2: Environmental Measurement Assignment
Waste Review Report**

Annex 3: Plastic Packaging Waste Dissertation

1. Abstract

Over the second six month period, the research has concentrated on ICL's compliance to the UK Government's Producer Responsibility (Packaging Waste) Regulations 1997. The deadline for registering with, and providing 1996 packaging flows data to, the Environment Agency was the 31st August 1997. The analysis and management of this data became my responsibility, once it had been gathered from the various ICL businesses.

Environmental legislation demands the production of environmental information (EI) that organisations have never previously had to consider or to record. This has been emphasised by its consistent recurrence throughout ICL's progress in meeting the first stage of the packaging legislation requirements. Under my supervision, four MSc students were taken on to carry out two projects relating to the UK Government's Producer Responsibility Obligations (Packaging Waste) Regulations 1997.

The first of these projects consisted of a Waste Review including measurement of the waste, and the second project was for one of the students to research into plastic packaging waste. The results of all three tiers of the packaging project are presented in this report.

As mentioned in my six month report, the attainment of environmental knowledge and the efficiency with which it is handled within the organisation is the first hurdle to establishing an effective working environmental management system (EMS). This has led the research to look at Knowledge Management in addition to Information Management. It is intended that the next stage is to carry out a literature search on these issues.

2. Introduction

This research seeks to outline the role for corporate environmental information management (EIM) and to engineer ways in which this role can function within large organisations. In order to achieve this, Corporate Information Systems will be examined to find appropriate applications to EI. This may enable organisations like ICL to simultaneously achieve the flexibility, speed, and responsiveness of smaller companies, with the scope and scale of being large. The main aim of this research is to develop a model of efficient EIM that is incorporated into the organisation's existing policies and systems. This in turn will be the foundation with which to establish and develop a generic EMS within the multifunctional organisation of ICL.

As a contribution to the EngD programme I assisted in the organisation of the Environmental Hands-on Audit module that was set-up at one of ICLE's (ICL Enterprises - an ICL subsidiary) Headquarters in Slough. This facilitated me to begin drafting the Legislation Manual and Procedures for the site's intended ISO 14001 registration. Details of this will be written in the 18 month report.

The main areas of work that have already contributed to the research are summarised in section 3 and are as follows:

1. The UK Government's Producer Responsibility (Packaging Waste) Regulations 1997 - ICL's 1996 data provision to the Environment Agency. The spreadsheets and questionnaires designed to collect and calculate the data.
2. Waste measurement and sampling strategies. The waste review report of ICL at Stevenage.
3. Plastic Packaging Waste - Case studies of ICL and Gregham Plastics

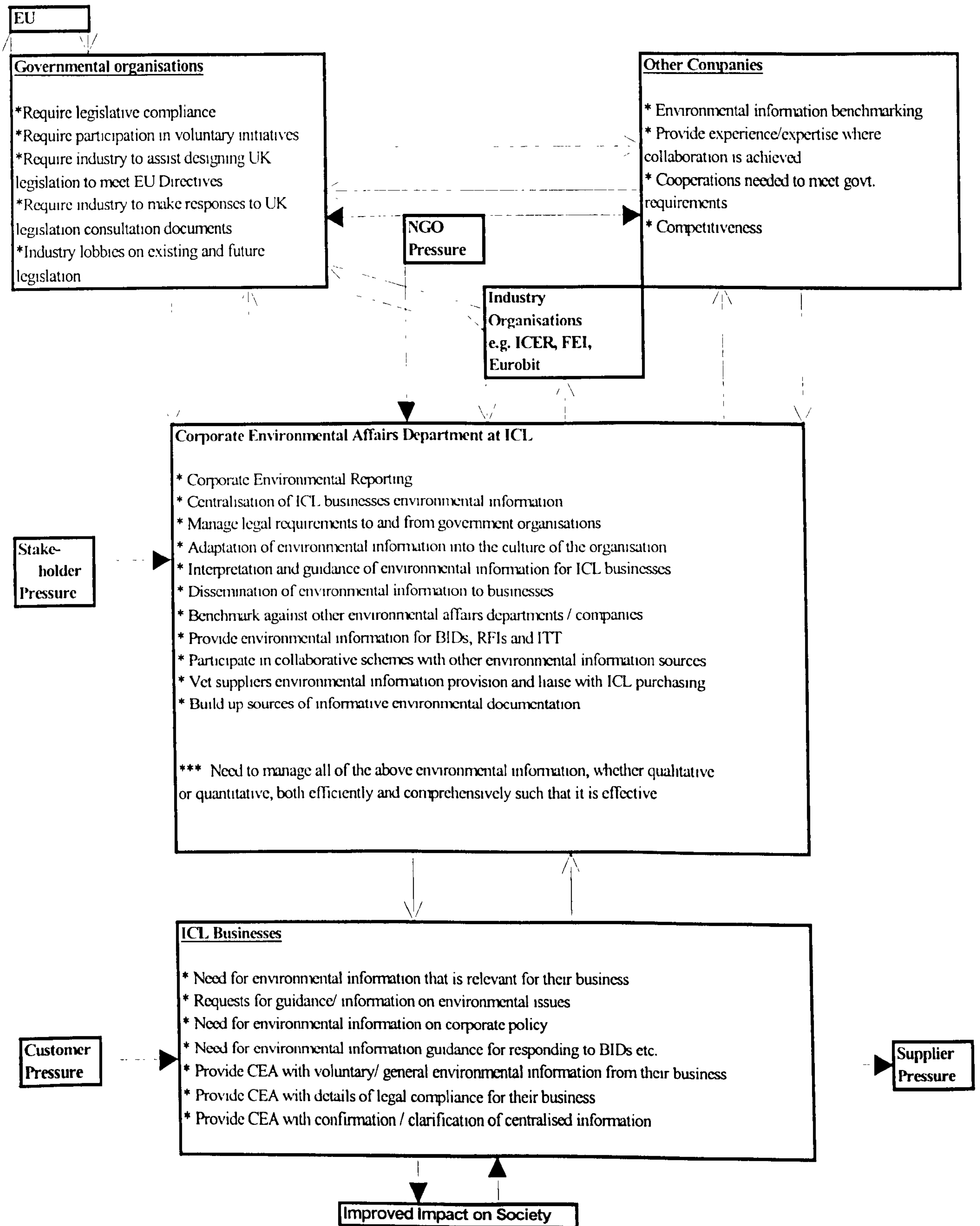
There have been many difficulties experienced within ICL in meeting the requirements of the packaging legislation. In the light of this experience, the fact that the EU have recently begun drafting the End-of-Life legislation for electrical and electronic waste has posed a very daunting prospect. The scope for overlap between the interpretation of the two Directives is large and such similarities provide opportunities to run projects in parallel. There is also the prospect of integrating any information management designed for packaging data to that of electrical and electronic data.

The next stage of the research will be to carry out a literature search on the subjects of corporate information systems and knowledge management. The flow of both information and knowledge to and from ICLE, in its implementation of an EMS, should facilitate the growth of a generic EMS that is unique to ICL and incorporates the use of a model to manage the EI.

The role for EIM within the Corporate Environmental Affairs (CEA) Department, and which may typify that of other organisations, is outlined in the Fig. 1. It shows the different pressures that create the need for the management and control of such information.

The constant assessment of the details and likely impacts of impending legislation is essential to inform the businesses of potential threats to their operations and company image. This is an example of information flowing into the business which then flows internally within the organisation, requiring the formulation of defined environmental information systems, and the feedback of such information to customers, suppliers, regulators and the government.

Fig. 1 THE ROLE FOR ENVIRONMENTAL INFORMATION MANAGEMENT (EIM)



Information can be defined as any data that has been collected and analysed. In order to produce comprehensive EI we need to collect and analyse environmental data. For this to happen, especially in an efficient way, we need satisfactory processes and procedures to manage the EI.

The aims of corporate EI are to raise awareness, provide training, interpret legislation, and communicate with stakeholders, customers and suppliers. All of these elements both require and provide a plethora of data, all of which require collection and analysis. Once this can be achieved the EI produced then needs managing. The management decisions that can be made on the basis of such information are dependent on the quality and quantity of the information provided. Thus there is a role for information management of EI just as there is with any other type of business information.

'Knowledge for profit' organisations are expected to dominate the 21st century. Many large professional organisations have recognised the strategic importance of Knowledge Management. Many international organisations are developing Knowledge Management strategies and systems to harness their greatest asset - knowledge. Institutes are researching and developing new ways to leverage knowledge assets to create new value, improve effectiveness and increase innovation within organisations. Knowledge as an asset is highly undervalued today and demands management. The alternative is 'Information Overload'.

Knowledge Management is designed to support and enhance the human communication and knowledge sharing processes. It is a team-enabling technology. This requires that a strong and open team communications and knowledge sharing culture be developed, and supported by a coaching and facilitative management style.

Knowledge management, therefore, has an important relevance to EI and its management because the difficulties with communicating EI is mostly to do with how it is received.

The barriers to the communication and use of EI include issues such as poor awareness, wide dispersion, non-recognition, non-availability, incorrect format, and incompatibility.

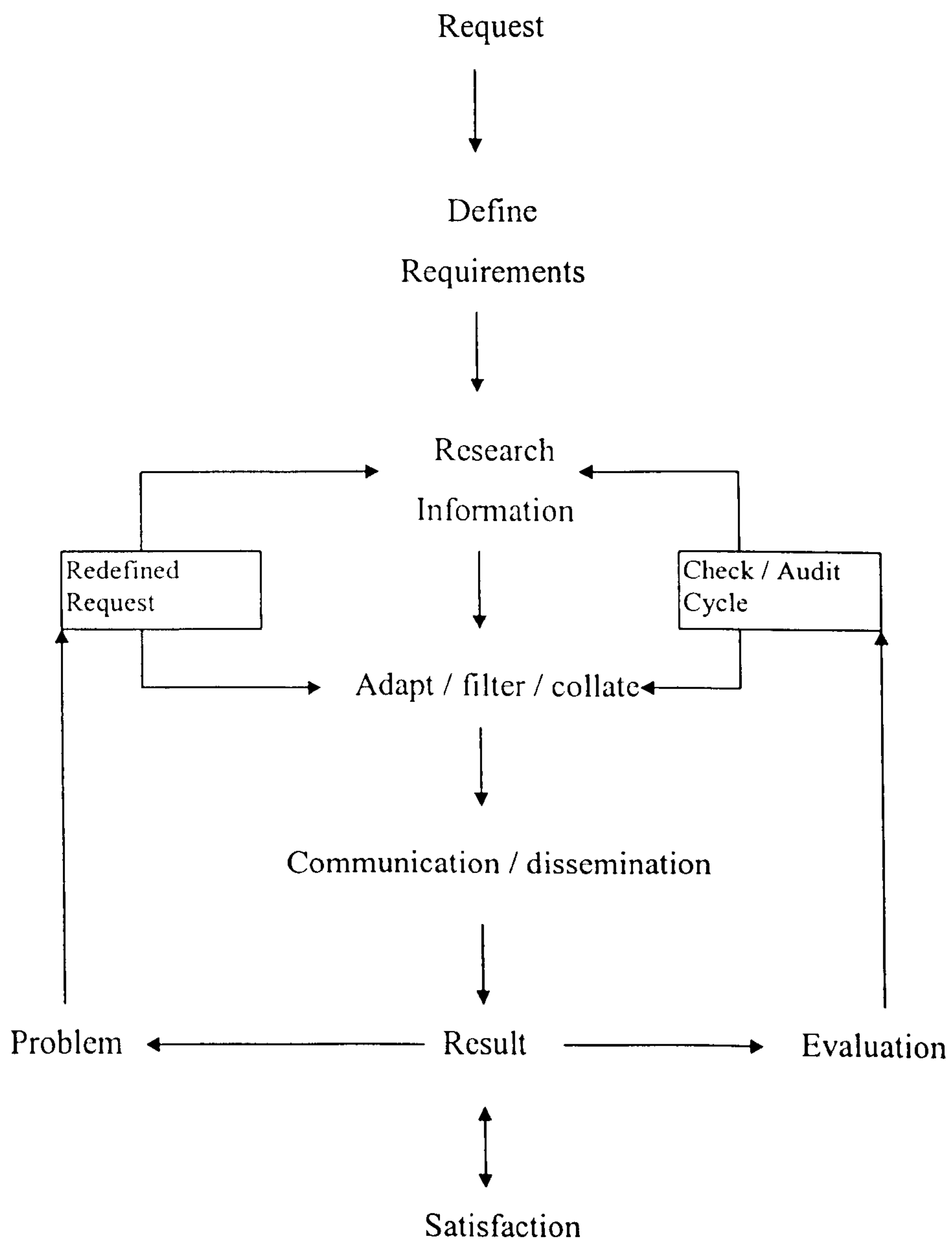
The key considerations that would constitute the EI include:

- Definition of Requirements
- Categorisation
- Recording / logging systems
- Media for communication
- Flow and responsibilities
- Dissemination
- Centralisation
- Harmonisation / formatting

An internal process proposed for dealing with EI is outlined in fig.2 and it provides parameters for performance indication. These indications include: firstly, the greater the repetition of 'check/ audit' or 're-define' cycles, the lower the performance (although this may be related to the complexity of the request); and secondly, the level of the satisfaction at the result stage and the amount of evaluation input. Finally, there are the implications of the time it takes to complete the whole process which will be dependent on the complexity of the information.

The major difficulties that have come to light so far have firstly been the perception of EI by business managers and secondly, the time constraints on those managers. There is a lack of environmental awareness within the organisation and a perception that the information is not relevant to them, and even when this is not the case the managers do not have the time to interpret the information to determine what is required from them. When the time is taken to interpret the information for them, environmental issues are usually placed last on the list of priorities.

Fig. 2 Internal Information Process



The transmission of EI to a potentially large range of receiving audiences is the basis of corporate communications. Corporate environmental reporting, as an example of the communications' capability of a company, is reflective of the quality of its EI and can be used as a performance indicator. A more advanced stage of managing EI is indicated by a strong training capability, but within most organisations this is in its infancy.

A study of corporate environmental reports has been carried out in order to assess companies for the efficiency of their EI. Overall, the study looked at over one hundred environmental reports on the Internet and around 50 hard copies. The author's observations on EI given in reports suggest that this information is:

1. poorly communicated due to poor readability¹ and design
2. lacking in detail and consistency
3. unreliable due to there being no agreed standard or code of practice for environmental reporting and little external verification
4. interesting but ambiguous and difficult to format
5. poor at relating performance of the business to environmental cost and risk
6. lacking in hard data that is both meaningful and understandable

The difficulty comes in distinguishing whether the poor quality of the EI in the reports is due to problems of communication and data presentation or the actual data used in its production.

The study was therefore limited in giving a clear idea of which companies handled EI well and which did not. It would be simplistic to assume, for example, that companies who do not produce environmental reports do not handle their information well. The study did, however, produce evidence of the qualitative points outlined above and provided evidence that there is a definite role for EIM.

3. Report Summary

Annex 1: Packaging Legislation - ICL's 1996 Data

As described in the 6 month report, the UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997, required obligated companies to register with the Environment Agency and provide data on its packaging flows for 1996, by 31st August 1997. The Annex holds the 1996 packaging data for ICL plc on spreadsheets that I designed to calculate ICL's recovery and recycling obligations.

As can be seen in the 6th month report, the calculations required by the legislation were fairly straight forward, but when applied to ICL's complex packaging flows, managing the data became a time-consuming and painstaking task. Previously, no measurements of packaging weights had been recorded, which meant that questionnaires had to be sent to suppliers and substantial amounts of weighing had to be carried out. Most of the data provided had been synthetically produced by multiplying packaging flow percentages against total packaging weights. The percentage flows were estimated or calculated from sales figures.

The data sent into CEA took a myriad of different forms and had to be calculated by hand. For 1997 the approach has been adapted, and instead of using spreadsheets, which many of the ICL businesses did not use, it was decided that listed questions should provide a more straight forward and comprehensive medium. The questionnaires were designed in response to the difficulties experienced with acquiring the relevant raw data and in the correct format. The Annex also holds these questionnaires which categorise the data by material type.

¹ This refers to a study carried out by C21, a group of environmental and communications specialists, using Fry's Readability Scale. The study showed that 80% of the FTSE top 100 reports they sampled were off

Annex 2: Waste Review

In order for ICL to develop a more closely defined waste strategy and to meet The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997, waste audits were set up. Annex 2 contains the Waste Audit Review, written by Simon Skentelbery, which serves to illustrate the difficulty of gathering EI that has not been required previously. A complication to the review process has been that waste management at ICL is contracted out to other companies who, because of handling charges, are not given any incentives to minimise ICL's waste.

In order to avoid the costs and environmental impacts of reverse logistics for recovery of packaging sent out of ICL, the company plans to meet its obligation from its own waste arisings. This poses the problem of whether the amount of packaging waste arising at ICL sites is enough to meet the company's obligation. Therefore, the waste review was set up to involve weighing samples of the waste in order to assess the amount of different packaging material types arising.

A waste sampling strategy was designed and various factors such as complying with the duty of care regulations have been taken into account. The procedure had to be expanded to incorporate the necessary practicalities to ensure accuracy of the results. The main considerations that had to be addressed include the weather conditions, negotiation of access, equipment, sample size, material types, timing and location. Details of this process are outlined in the Environmental Measurement Assignment which describes the waste sampling and measurement strategies employed. Due to the lack of documentation on how to perform a waste measurement review, the procedure and sampling strategy had to be developed, continually expanded and reassessed as new experience and knowledge were gained. In the future, it is envisaged that the techniques can be adapted and used at other ICL sites and the information produced used to more closely define ICL's waste strategy.

the scale, i.e. post graduate level.

Annex 3: Plastic Packaging Waste

This project was set up in order to assess the problems imposed by the expense and complexities of recovery and recycling plastics for the purposes of meeting the UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997. As ICL handles a lot of plastic packaging, it was recognised that it would make up a substantial amount of ICL's obligation. The MSc dissertation written by Anders Nielsen is reproduced in annex 3 and details the research carried out and the recommendations made to ICL.

ICL's main business function is systems integration of IT equipment, and because electronic equipment is extremely sensitive, the bulk of its packaging is scientifically designed. The packaging is not used as a marketing tool because the customer does not usually see the packaging until the products have already been purchased and are being integrated on the customer's site.

ICL should ensure that sufficient awareness and training be carried out when recycling schemes are set up. This is because of the importance of keeping plastics segregated into specific types such as polystyrene or polyethylene. In addition, this creates the need for recycling schemes to be introduced by material type one at a time in order to prevent confusion. Sources of contamination come from many other environmental factors such as soiled compactors etc., therefore, care should be taken to keep areas clean and waste contained / protected.

Gaining advice from recyclers and liaising with them on different issues will play an important role in the effective management of ICL's waste. The case study of Gregham plastics exemplifies this well. It is possible that ICL will send combustible plastic wastes, for which recycling is not a feasible option, for incineration with energy recovery.

4. Conclusion and Future Work

The UK Government's transposal of the EU Directive is the most complex of all the Member States. This has meant that it is both difficult and time-consuming to implement within an organisation. The legislation lays full responsibility and costs at industries doorstep with no account of consumers or local authorities.

The spirit of the legislation is shared responsibility but it only applies to producers and not to consumers. As an end-user of certain packaging, ICL is not obligated on such packaging i.e. waste packaging. These back-door arisings can, therefore, be used towards meeting ICL's obligations thus avoiding the costs and environmental impacts of reverse logistics.

Companies are often burdened by more than one activity obligation which may well be carried out elsewhere in the supply chain. This sort of issue was repeated in many different forms and resulted in the complexities growing as legislative 'tweaking' took place. One example of such an issue was the complexities of who took on the packaging obligation when third parties were involved and evolved the use of the term 'taking title-ship'.

The legislation is highly bureaucratic and demands a great deal of data from obligated companies. The acquisition of such data and subsequent analysis to provide the relevant and formatted information is an expensive and time-consuming process. This processing of information, which needs to be auditable, requires databases and information systems to be set up, which becomes expensive. The UK Government has severely underestimated the cost of implementation for industry.

The UK Government has not ensured a closing of the life cycle loop in terms of the recycling and recovery infrastructure. For example, it is mandatory to recycle packaging but not to purchase recycled packaging which suggests the prospect of another DSD

(Duales System Deutschland). Neither have there been any actions taken to promote voluntary improvements to the UK recovery and recycling infrastructure. Without resourcing for the development of the infrastructure or production of a market for recycle, it is difficult to see how a crisis involving packaging mountains will be avoided.

The receipts for packaging recycled or recovered will be in the form of PRNs (Producer Responsibility Notes) and these will be presented to the Environment Agency to show that a company's obligations have been met. It is expected that an internal market in PRNs will develop but the lack of recovery and recycling facilities will push prices up unless they can be received for merely taking the packaging to the recycler. If this is the case, however, the packaging will merely continue to be landfilled.

To meet the information requirements of the legislation, the information on packaging flows needs to be consistent but product lines and trading levels are non-static. This presents the problem of continuous updating and changing of the databases or computer systems that are eventually put in place. At present, there is no information in ICL on the total amounts spent on packaging let alone the intricate details required by the legislation such as the metrics on packaging weights by composition. Often the existing product data systems do not have any capacity for new data and especially not for the large quantities of information required. The complexities of the pathways of product flows means that separate systems would possibly have to be set up in order to calculate the proportions of activity obligations.

What has become apparent and most useful to the research is that there has been an unwillingness between the ICL businesses to share information. It may be that the theories behind Knowledge Management could facilitate an answer to these more cultural than technical difficulties. The sharing of information from suppliers has not been forthcoming and it is probable that they are in a similar position to ICL in that they don't have records of the metrics.

What has shown to be effective is a functional team situation where there is support from the relevant managers and the group is already motivated by environmental issues. In addition to a pragmatic approach, the crucial necessary time was given. As so often has been said before, if the top management of an organisation do not give active support to an issue, there is little chance that much will be done. Managers lower down will be unable to give it priority unless they are given direction to do so.

An intranet page is currently being considered which will be put on ICL's internal website and will contain all the packaging metrics and the contact names for the different businesses. This meets the need to centralise the packaging data and yet also allow the information to be shared between the businesses. It is intended that all data provided to CEA in the future should be in the same format to ease the analysis process.

The questionnaires in annex 1 were designed to facilitate this. It is also planned that ICL should actively support the use of recyclate and thereby involve purchasing in the packaging project. Longer term plans involve firstly, the development of contracts and alliances with waste management and recycling companies, and secondly, the management of the supply chain for both packaging and product suppliers.

Many of the lessons learnt from the packaging legislation are going to be applied to the impending legislation on end-of-life electronic products. A recycling consultancy has been employed to carry out environmental audits of electronic scrap recyclers. It is clear that there is a need to research the capacity and environmental efficiency of such recyclers.

The issue of electronic metrics poses a similar problem to that experienced with packaging metrics, because electronic product sales are recorded in units whereas the take-back legislation will require tonnages. Another similarity to the packaging project is that the efficiency of information provision will be hindered by the one-off projects, trade

fluctuations and product changes. It may be beneficial to parallel any information management designed for packaging measurements with that of electronic products. The additional information required, however, for electronic products take-back is that of hazardous components and which leads to the necessity of audit trails.

The waste review has thrown up a whole host of problems that are integral to the contracting situation. The degree of control by ICL over the contractors activities is limited and information is not forthcoming. The data provided by the contractors and subcontractors concerning waste does not tally with that discovered from the waste measurements taken from the Stevenage site. It is possible, therefore, that the contractors are quoting higher tonnages of waste than are the true values.

The waste measurement process is critiqued scientifically in my assignment in annex 2, but essentially the figures produced can only be taken as representative for the period of the measurement process (roughly one month). Therefore, the extrapolation of the data to a yearly figure is at best only a ball-park figure and at worst unreliable. The constriction of resources and time available rules out the possibility of a continuous sampling strategy for a year which would provide a more accurate figure

However, the contractors annual waste figure is sixteen times the value extrapolated from the waste measurement audit data. Such a discrepancy has served to raise many questions concerning ICL's waste costs over the UK. In addition, the costs of waste management for the site was requested twice, firstly by a CEA questionnaire and secondly by the waste review, but the two figures did not match. This example is but one of many which are continuing examples of the difficulties surrounding EIM. How can information be managed when the sources are unreliable?

The contractor situation creates a range of problems when considering possible improvements to ICL's waste strategy. This particular case scenario offers an exaggerated example of the difficulties and barriers to sharing information. This has led the research to consider a Knowledge Management approach. Unfortunately, Knowledge Management is fairly embryonic but its principles apply well to the issues involved when considering EIM. A future area for the research will be to look at whether and how Knowledge Management is applied to the quality culture within ICL and the parallels for developing a similar application to that of environmental issues.

Report Number 2

Annex 1

ICL's Compliance to the UK Packaging Legislation

In order for ICL plc to comply with the UK packaging legislation, Corporate Environmental Affairs has a statutory obligation to make a report to the Environment Agency on our usage of packaging. In order for us to calculate ICL's total tonnage obligations, it is necessary for each ICL business to report the amount of packaging flowing through it.

The worksheet in excel has been designed for this purpose and an explanation of how to fill in the tables is described below. Once filled in, the tables should be returned to the Corporate Environmental Affairs Department. All data should be input in tonnes (where 1kg = 0.001 tonnes).

Packaging material types:

1. **Paper and Cardboard Packaging** - do not confuse non-packaging paper in with this.
2. **Plastics packaging** - this includes all types of packaging but bear in mind that ICL may need to segregate plastics into different types in order to make recycling possible.
3. **Glass** - it is unlikely that ICL handles any glass packaging
4. **Steel**
5. **Aluminium**
6. **Wood**
7. **Composites** (this is optional at the moment but we would like to start recording it)

Activities Carried Out on the Packaging:

1. **Wholesaler** - This is for packaging around products that are bought in, stored in a warehouse (are not repacked), and then sold onto a retailer.
2. **Wholesaler*** - The same activity as 1. except that the retailer is not registered with the Environment Agency as legally obligated under the Packaging regulations, i.e. is a UK based company that handles less than 50 Tonnes of packaging per annum and has a turnover of less than £5m. If you do not know if the supplier is legally obligated under the Packaging regulations, contact Environmental Affairs, or ask the supplier for clarification.
3. **Packer/ Filling** - This covers packaging that is bought in from a manufacturer e.g. a cardboard box, and used to pack a product before selling on to a VAR (e.g. Barron McCann) or retailer (e.g. Dixons).
4. **Selling** - This packaging is that which is bought from a supplier such as D2D (ie a packer/ filler), already around a product and sold direct to an end-user.

Tables:

- 1. Packaging Supplied** - total amount of packaging supplied i.e. all packaging passing through the business.
- 2a. Packaging Exported** - amount of packaging sold out of the UK as exports, including exports to EU countries.
- 2b. Packaging Exported by a 3rd Party** - amount of packaging exported by a 3rd party.
- 3. Packaging Imported** - amount of packaging imported
Transit packaging around imports - amount of packaging bought in surrounding imports (for the purposes of transit) that is disposed of within ICL. This figure should already be included in the packaging imported figures.
- 4. Re-Use** - amount of packaging that has been reused (and which can be proven by some documented process, e.g. bar coding) for three complete cycles.
- 5. Composites** - these should be included according to the predominant material by total weight.
- 6. Recovery/Recycling levels** - amounts of packaging materials that have been recovered or recycled.
- 7. Obligation** - is to be filled in by Corporate Environmental Affairs and returned to you.

After our 1996 data return for the 31st August 1997 registration, we need figures to be as accurate as possible. There should be systems in place for collecting accurate packaging data. The 1997 figures should be returned to Environmental Affairs by 1st February 1998.

Should you have any queries, please contact the Corporate Environmental Affairs Department on:-

Tel: 7221-3179/ 2788/ 2559 or Fax: 7221-6671

Table 1: Packaging/Packaging Materials Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
raw material manufacturing							
conversion							
pack/ filling	539 95	0 00	0 00	0 32	14 18	315 73	0 00
selling	1,146 06	0 00	0 00	49 00	90 09	373 23	0 00

Table 2a: Packaging/Packaging Materials Exported by the Producer

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
raw material manufacturing							
conversion							
pack/ filling	265 36	0 00	0 00	0 00	0 65	14 69	0 00
selling	363 89	0 00	0 00	1 33	5 57	32 29	0 00

Table 2b: Packaging/Packaging Materials Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
raw material manufacturing							
conversion							
pack/ filling	0 00	0 00	0 00	0 00	0 00	0 00	0 00
selling	0 00	0 00	0 00	0 00	0 00	0 00	0 00

Table 3: Tonnage of Packaging/Packaging Materials Imported for the purpose of the named activity

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
conversion							
pack/ filling	0 00	0 00	0 00	0 00	0 00	0 00	0 00
selling	73 78	0 00	0 00	0 04	6 44	153 57	0 00
transit packaging around imports	303 54	0 00	0 00	0 02	6 32	14 98	0 00

Table 4: Statement of Obligations

Recovery obligation			336 68	
Recycling obligation	paper		56 64	
	glass		0 00	
	metals	aluminium		0 00
		steel		1 58
	plastic		3 80	

Table 5: Re-Use (optional)

Paper		0 00
Glass		0 00
Metals	aluminium	0 00
	steel	0 00
Plastics		0 00
Wood from 1 1 2000		229 00
Other from 1 1 2000		0 00

Table 6: Composites (optional)

Paper		0 00
Glass		0 00
Metals	aluminium	0 00
	steel	0 00
Plastics		0 00
Wood from 1 1 2000		0 00
Other from 1 1 2000		0 00

Table 7: Levels of Recovery and Recycling (optional in 1997 and 1998 only)

Recovery			0 00	
Recycling	paper		0 00	
	glass		0 00	
	metals	aluminium		0 00
		steel		0 00
	plastic		0 00	
				0 00

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	155 10	0 00	0 00	0 00	25 40	0 00	0 00
wholesaler*	20 10	0 00	0 00	0 00	3 28	0 00	0 00
pack/ filling	539 95	0 00	0 00	0 32	14 18	315 73	0 00
selling	1146 06	0 00	0 00	49 00	90 09	373 23	0 00

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0 00	0 00	0 00	0 00	0 00	0 00	0 00
wholesaler*	0 00	0 00	0 00	0 00	0 00	0 00	0 00
pack/ filling	265 36	0 00	0 00	0 00	0 65	14 69	0 00
selling	363 89	0 00	0 00	1 33	5 57	32 29	0 00

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0 00	0 00	0 00	0 00	0 00	0 00	0 00
wholesaler*	0 00	0 00	0 00	0 00	0 00	0 00	0 00
pack/ filling	0 00	0 00	0 00	0 00	0 00	0 00	0 00
selling	0 00	0 00	0 00	0 00	0 00	0 00	0 00

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0 00	0 00	0 00	0 00	0 00	0 00	0 00
wholesaler*	0 00	0 00	0 00	0 00	0 00	0 00	0 00
pack/ filling	0 00	0 00	0 00	0 00	0 00	0 00	0 00
selling	73 78	0 00	0 00	0 04	6 44	153 57	0 00
transit packaging around imports	303 54	0 00	0 00	0 02	6 32	14 98	0 00

Table 4: Re-Use (optional)

Paper		0 00
Glass		0 00
Metals	aluminium	0 00
	steel	0 00
Plastics		0 00
Wood from 1 1 2000		229 00
Other from 1 1 2000		0 00

Table 5: Composites (optional)

Paper		0 00
Glass		0 00
Metals	aluminium	0 00
	steel	0 00
Plastics		0 00
Wood from 1 1 2000		0 00
Other from 1 1 2000		0 00

Table 6: Levels of Recovery and Recycling

Recovery			0 00	
Recycling	paper		0 00	
	glass		0 00	
	metals	aluminium		0 00
		steel		0 00
	plastic			0 00
				0 00

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			336 68	
Recycling obligation	paper		56 64	
	glass		0 00	
	metals	aluminium		0 00
		steel		1 58
	plastic			3 80
				0 00

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	0 24				0 04	0 05	
selling	13 10				2 54	0 63	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 2b Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports							

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recyclin	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			2 83	
Recyclin	paper		0 44	
	glass		0 00	
	metals	aluminium		0 00
		steel		0 00
	plastic			0 08

Calculati	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	6 24	0 00	0 00	0 00	1 21	0 31	0 00	
Imports o	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
Total Rec	2 37	0 00	0 00	0 00	0 46	0 12	0 00	2 83
Total Rec	0 44	0 00	0 00	0 00	0 08	0 02	0 00	

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	27 69			0 32	7 57	23 34	
selling	102 43			0 32	17 43	24 46	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	38 10				4 52		

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports	53 69			0 02	5 75	0 32	

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			41 31
Recycling obligation	paper		6 57
	glass		0 00
	metals	aluminium	0 00
		steel	0 02
	plastic		1 02

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	40 20	0 00	0 00	0 26	8 79	19 90	0 00	
imports obl (Roll-up)	53 69	0 00	0 00	0 02	5 75	0 32	0 00	
Total Recv. obl.	35 68	0 00	0 00	0 11	5 52	7 68	0 00	41 31
Total Recl. obl.	6 57	0 00	0 00	0 02	1 02	1 42	0 00	

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	451.11				1.04	24.97	
selling	530.72				1.23	29.38	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	265.36				0.61	14.69	
selling	312.19				0.72	17.28	

Table 2b Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	62.44				0.14	3.46	
transit packaging around imports	249.75				0.58	13.82	

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6. Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
plastic			

Table 7. Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			172.32	
Recycling obligation	paper		31.67	
	glass		0.00	
	metals	aluminium		0.00
		steel		0.00
	plastic			0.07

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act obl	169.58	0.00	0.00	0.00	0.39	9.39	0.00	
Imports obl. (Roll-up)	282.84	0.00	0.00	0.00	0.65	15.66	0.00	
Total Recv. obl.	171.92	0.00	0.00	0.00	0.40	9.52	0.00	172.32
Total Recl. obl.	31.67	0.00	0.00	0.00	0.07	1.75	0.00	

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	155 10				25 40		
wholesaler*	20 10				3 28		
pack/ filling	52 10				3 00	152 60	
selling	380 90				57 30	152 60	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 2b Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports							

Table 4 Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		229 00
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6. Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7. Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			85 80	
Recycling obligation	paper		13 84	
	glass		0 00	
	metals	aluminium		0 00
		steel		0 00
	plastic		1 96	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act obl.	197 78	0 00	0 00	0 00	28 01	126 66	0 00	
Imports obl (Roll-up)	0 00	0 00	0 00	0 00	0 00	0 00	0 00	
Total Recv. obl.	75 16	0 00	0 00	0 00	10 64	48 13	0 00	85 80
Total Recl obl.	13 84	0 00	0 00	0 00	1 96	8 87	0 00	

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	8.59				2.36	8.59	
selling	19.97			39.20	8.89	150.12	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 2b Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	11.34			0.04	6.29	150.12	
transit packaging around imports							

Table 4. Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5 Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6 Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			17.21	
Recycling obligation	paper		1.29	
	glass		0.00	
	metals	aluminium		0.00
		steel		1.29
	plastic		0.59	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act obl.	12.48	0.00	0.00	18.42	5.03	73.65	0.00	
Imports obl (Roll-up)	6.01	0.00	0.00	0.02	3.34	79.56	0.00	
Total Recv. obl.	7.02	0.00	0.00	7.01	3.18	58.22	0.00	17.21
Total Recl. obl	1.29	0.00	0.00	1.29	0.59	10.72	0.00	

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	0 23			0 00	0 17	106 18	
selling	93 44			9 48	1 05	14 89	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling					0 04		
selling	13 05			1 33	0 16	14 89	

Table 2b. Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports	0 10					0 84	

Table 4. Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7. Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			16 06	
Recycling obligation	paper		2 66	
	glass		0 00	
	metals	aluminium		0 00
		steel		0 27
	plastic			0 03

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	37 87	0 00	0 00	3 83	0 47	38 22	0 00	
Imports obl (Roll-up)	0 10	0 00	0 00	0 00	0 00	0 84	0 00	
Total Recv. obl.	14 43	0 00	0 00	1 46	0 18	14 84	0 00	16.06
Total Recl. obl	2 66	0 00	0 00	0 27	0 03	2.73	0.00	

Table 1 Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	5.50				1.65	1.16	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	0.55				0.17	0.12	

Table 2b Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports							

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			1.15	
Recycling obligation	paper		0.16	
	glass		0.00	
	metals	aluminium		0.00
		steel		0.00
	plastic		0.05	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act obl.	2.33	0.00	0.00	0.00	0.70	0.49	0.00	
Imports obl (Roll-up)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Recv. obl.	0.88	0.00	0.00	0.00	0.27	0.19	0.00	1.15
Total Recl obl	0.16	0.00	0.00	0.00	0.05	0.03	0.00	

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ICL's Compliance to the UK Packaging Legislation

In order for ICL plc to comply with the UK packaging legislation, Corporate Environmental Affairs has a statutory obligation to make a report to the Environment Agency on our usage of packaging. In order for us to calculate ICL's total tonnage obligations, it is necessary for each ICL business to report the amount of packaging flowing through it.

The questionnaire has been designed for this purpose and a glossary of terms is listed below. Once filled in, the questionnaire should be returned to the Corporate Environmental Affairs Department.

Packaging material types:

Section 1. Paper and Cardboard Packaging - this does not include non-packaging paper.

Section 2. Plastics packaging - this includes all types of packaging but bear in mind that ICL may need to segregate plastics into different types in order to make recycling possible.

Section 3. Steel

Section 4. Aluminium

Section 5. Wood

Section 6. Glass - it is unlikely that ICL handles any glass packaging

Section 7. Other

1.1 to 1.4 Refer to the total amount of packaging supplied i.e. all packaging passing through the business, categorised according to the activities carried out on them:

1.1 Packer/ Filling - This covers packaging that is bought in from a manufacturer e.g. a cardboard box, and used to pack a product before selling on to a VAR (e.g. Barron McCann) or retailer (e.g. Dixons).

1.2 Retailer/ Selling - This packaging is that which is bought from a supplier such as D2D (ie a packer/ filler), already around a product and sold direct to an end-user.

1.3 Refers to packaging that has both been pack/filled and retailed - bought from a manufacturer of packaging, used to package a product that is then sold to an end-user. This includes UK sourced transit packaging

1.4 Wholesaler - This is for packaging around products that are bought into the company, is not repacked in any way, i.e. not 1.1, and is then sold directly on to a retailer, i.e. not 1.2. This applies mainly to TPLC.

1.5 Wholesaler* - The same activity as 1.4 except that the retailer is not registered with the Environment Agency as legally obligated under the Packaging regulations, i.e. is a UK based company that handles less than 50 Tonnes of packaging per annum and has a turnover of less than £5m. If you do not know if the supplier is legally obligated under the Packaging regulations, contact Environmental Affairs, or ask the supplier for clarification.

1.6 to 1.11 Refers to totals exported by your business, according to the activities carried out on them

1.6, 1.8 and 1.10 Packaging Exported - amount of packaging sold out of the UK as exports, including exports to EU countries.

1.7, 1.9 and 1.11 Packaging Exported by a 3rd Party

1.12 to 1.14 Refers to totals imported by your business, according to the activities carried out on them

1.15 Transit packaging around imports - the amount of packaging bought in surrounding imports (for the purposes of transit) that is disposed of within ICL. This figure should not have been included in with total imported packaging.

1.16 Re-Use - the amount of packaging that has been used for the same purpose a second time or more. (The first time it is used, it should be counted as non-reuse)

1.17 Recycling levels - amounts of packaging materials that have been recycled.

1.18 Recovery levels - amounts of packaging materials that have been recovered i.e. energy recovery via incineration. If in doubt, please speak to Corporate Environmental Affairs.

1.18 Composites - these should be included according to the predominant material by total weight.

After our 1996 data return for the 31st August 1997 registration, we need figures to be as accurate as possible. There should be systems put in place for collecting accurate packaging data. The figures should be returned to Corporate Environmental Affairs on a monthly/ quarterly (?) basis and the final 1997 figures submitted by 1st February 1998.

Should you have any queries, please contact the Corporate Envir

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Packaging Data Questionnaire for Legal Compliance with the UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997

Please answer all questions in METRIC TONNES (i.e. where 1 tonne = 1000 kgs)
All questions apply to 1997 TOTALS. All packaging that is REUSED should be counted only once i.e. when it is first brought into the business. All COMPOSITES should be recorded in terms of the material type of largest weight.

Section 1 All Questions Apply to Cardboard and Paper-based Packaging Only

- 1.1 How much did you pack / fill?
- 1.2 How much did you retail?
- 1.3 How much did you both pack/ fill and retail?

- 1.4 How much did you wholesale?
- 1.5 Of the quantity given in 1.4,
how much did you sell to a non-obligated retailer in the UK?
- (note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.

- 1.6 How much of 1.1 did you export?
- 1.7 How much of 1.1 was exported by a 3rd party?
- 1.8 How much of 1.2 did you export?
- 1.9 How much of 1.2 was exported by a 3rd party?
- 1.10 How much of 1.3 did you export?
- 1.11 How much of 1.3 was exported by a 3rd party?

- 1.12 How much of 1.1 was imported?
- 1.13 How much of 1.2 was imported?
- 1.14 How much of 1.3 was imported?
- 1.15 How much transit packaging was imported?

- 1.16 How much has been reused?
- 1.17 How much has been recycled?
- 1.18 How much has been recovered?
- 1.19 How much composites? (optional)

Section 2 All Questions Apply to Plastic Packaging Only

- 2.1 How much did you pack / fill?
- 2.2 How much did you retail?
- 2.3 How much did you both pack/ fill and retail?

- 2.4 How much did you wholesale?
- 2.5 Of the quantity given in 2.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.
- 2.6 How much of 2.1 did you export?
- 2.7 How much of 2.1 was exported by a 3rd party?
- 2.8 How much of 2.2 did you export?
- 2.9 How much of 2.2 was exported by a 3rd party?
- 2.10 How much of 2.3 did you export?
- 2.11 How much of 2.3 was exported by a 3rd party?
- 2.12 How much of 2.1 was imported?
- 2.13 How much of 2.2 was imported?
- 2.14 How much of 2.3 was imported?
- 2.15 How much transit packaging was imported?
- 2.16 How much has been reused?
- 2.17 How much has been recycled?
- 2.18 How much has been recovered?
- 2.19 How much composites? (optional)

Section 3 All Questions Apply to Steel Packaging Only

- 3.1 How much did you pack / fill?
- 3.2 How much did you retail?
- 3.3 How much did you both pack/ fill and retail?
- 3.4 How much did you wholesale?
- 3.5 Of the quantity given in 3.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.
- 3.6 How much of 3.1 did you export?
- 3.7 How much of 3.1 was exported by a 3rd party?
- 3.8 How much of 3.2 did you export?
- 3.9 How much of 3.2 was exported by a 3rd party?
- 3.10 How much of 3.3 did you export?
- 3.11 How much of 3.3 was exported by a 3rd party?

- 3.12 How much of 3.1 was imported?
- 3.13 How much of 3.2 was imported?
- 3.14 How much of 3.3 was imported?
- 3.15 How much transit packaging was imported?

- 3.16 How much has been reused?
- 3.17 How much has been recycled?
- 3.18 How much has been recovered?
- 3.19 How much composites? (optional)

Section 4 All Questions Apply to Aluminium Packaging Only

- 4.1 How much did you pack / fill?
- 4.2 How much did you retail?
- 4.3 How much did you both pack/ fill and retail?

- 4.4 How much did you wholesale?
- 4.5 Of the quantity given in 4.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.

- 4.6 How much of 4.1 did you export?
- 4.7 How much of 4.1 was exported by a 3rd party?
- 4.8 How much of 4.2 did you export?
- 4.9 How much of 4.2 was exported by a 3rd party?
- 4.10 How much of 4.3 did you export?
- 4.11 How much of 4.3 was exported by a 3rd party?

- 4.12 How much of 4.1 was imported?
- 4.13 How much of 4.2 was imported?
- 4.14 How much of 4.3 was imported?
- 4.15 How much transit packaging was imported?

- 4.16 How much has been reused?
- 4.17 How much has been recycled?
- 4.18 How much has been recovered?
- 4.19 How much composites? (optional)

Section 5 All Questions Apply to Wood Packaging Only

- 5.1 How much did you pack / fill?
- 5.2 How much did you retail?
- 5.3 How much did you both pack/ fill and retail?

- 5.4 How much did you wholesale?
- 5.5 Of the quantity given in 5.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.
- 5.6 How much of 5.1 did you export?
- 5.7 How much of 5.1 was exported by a 3rd party?
- 5.8 How much of 5.2 did you export?
- 5.9 How much of 5.2 was exported by a 3rd party?
- 5.10 How much of 5.3 did you export?
- 5.11 How much of 5.3 was exported by a 3rd party?
- 5.12 How much of 5.1 was imported?
- 5.13 How much of 5.2 was imported?
- 5.14 How much of 5.3 was imported?
- 5.15 How much transit packaging was imported?
- 5.16 How much has been reused?
- 5.17 How much has been recycled?
- 5.18 How much has been recovered?
- 5.19 How much composites? (optional)

Section 6 All Questions Apply to Glass Packaging Only

- 6.1 How much did you pack / fill?
- 6.2 How much did you retail?
- 6.3 How much did you both pack/ fill and retail?
- 6.4 How much did you wholesale?
- 6.5 Of the quantity given in 6.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.
- 6.6 How much of 6.1 did you export?
- 6.7 How much of 6.1 was exported by a 3rd party?
- 6.8 How much of 6.2 did you export?
- 6.9 How much of 6.2 was exported by a 3rd party?
- 6.10 How much of 6.3 did you export?
- 6.11 How much of 6.3 was exported by a 3rd party?

- 6.12 How much of 6.1 was imported?
- 6.13 How much of 6.2 was imported?
- 6.14 How much of 6.3 was imported?
- 6.15 How much transit packaging was imported?

- 6.16 How much has been reused?
- 6.17 How much has been recycled?
- 6.18 How much has been recovered?
- 6.19 How much composites? (optional)

Section 7 All Questions Apply to Other Packaging - please specify material type

- 7.1 How much did you pack / fill?
- 7.2 How much did you retail?
- 7.3 How much did you both pack/ fill and retail?

- 7.4 How much did you wholesale?
- 7.5 Of the quantity given in 7.4,
how much did you sell to a non-obligated retailer in the UK?
(note: this refers to retailers that handle less than 50 tonnes
packaging p.a. and have a turnover of less than £1m. and are
not registered with the Environment Agency.

- 7.6 How much of 7.1 did you export?
- 7.7 How much of 7.1 was exported by a 3rd party?
- 7.8 How much of 7.2 did you export?
- 7.9 How much of 7.2 was exported by a 3rd party?
- 7.10 How much of 7.3 did you export?
- 7.11 How much of 7.3 was exported by a 3rd party?

- 7.12 How much of 7.1 was imported?
- 7.13 How much of 7.2 was imported?
- 7.14 How much of 7.3 was imported?
- 7.15 How much transit packaging was imported?

- 7.16 How much has been reused?
- 7.17 How much has been recycled?
- 7.18 How much has been recovered?
- 7.19 How much composites? (optional)

Report Number 2

Annex 2

Environmental Measurement Assignment

Waste Measurement at ICL

Gail Collins

RE1

1.0 Background

In order for ICL to develop a more closely defined waste strategy and to meet The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997, waste audits have been set up. Another driver behind the project is the expected rise in cost of landfill. Waste management at ICL is contracted out to other companies who, because of handling charges, are not given any incentives to minimise ICL's waste.

In order to avoid the costs, both financial and environmental, of reverse logistics for recovery of packaging sent out of ICL, the company plans to meet its obligation from its own waste arisings. This poses the problem of whether the amount of packaging waste arising at ICL sites is enough to meet the company's obligation. Data on the packaging flows and weights, by pre-defined generic types, have been used to calculate the obligation.

The waste audits have been set up to involve weighing samples of the waste in order to assess the amount of different packaging material types arising. A waste sampling strategy has been designed and various factors such as complying with the duty of care regulations have had to be taken into account. The procedure has been expanded to incorporate the necessary practicalities to ensure accuracy of the results. The main considerations that have had to be addressed include the weather conditions, negotiation of access, equipment, sample size, material types, timing and location.

Due to the lack of documentation on how to perform a waste measurement audit, the procedure and sampling strategy have had to be developed, continually expanded and reassessed as new experience and knowledge is gained. In the future, it is envisaged that the techniques can be adapted and used at other ICL sites and the information produced used to more closely define ICL's waste strategy.

2.0 The Procedure

2.1 Duty of Care

The waste review and waste measurements have been supervised by myself, and carried out by three Brunel students who are using the findings to aid the writing of their MSc dissertations. The main concern at first was to ensure that all activities to weigh the waste did not breach the requirements laid out in the EPA 1990 regarding Duty of Care. In order to ensure that the Duty of Care Code of Practice and the legal requirements were met, I designed a written procedure. This is described below and has been applied in practice by the MSc students.

2.2 Weather Conditions

Weather conditions defined the approach to sampling and where the conditions were extreme, no sampling was carried out. It had to be taken into account that once waste was removed from the skips, it would be exposed to external factors of dampness etc. The effects of windy or rainy weather were both considered for any environmental impacts and subsequent breaches in the Duty of Care. In addition, it became apparent that the various factors being considered would affect the accuracy of the measurement method.

Windy conditions can have two effects, namely odour problems and littering. Odour from any putrescibles or other waste material may be transported and affect other site personnel or members of the neighbouring public. This may cause a nuisance under part (d) of section 79 of the EPA 1990.

The second effect is that during the process of sampling from the skip, extracted material may be transported away from the skip by windy conditions. This would be a breach of the Duty of Care and would be detrimental to the accuracy of the measurements carried out.

Rain creates problems with the sampling process in that it can cause the creation of leachate. The location of the drainage systems in the surrounding area were carefully assessed before any sampling was carried out. In addition, all sampling was carried out over plastic sheeting in order to prevent any run-off. Rain during sampling can wet the samples taken, causing erroneously high results, and in some cases can damage the structure of the materials.

2.3 Protective Measures

In addition to environmental issues, Health and Safety aspects had to be considered. Before any sampling began, notification was given to site security and the responsible persons for the relevant skip. The compactors that were attached to skips had to be isolated from the power supply and, as a secondary precaution, the ignition key was removed. Protective clothing was worn by all those entering the skips and included:

1. tough gloves, boots and overalls
2. chemical and dust anti-mist goggles
3. breathing protection masks manufactured to the appropriate BS/EN Standards.

At any one time, one member of the team would remain outside the skip. The area around the skip was protected with a large plastic tarpaulin. The materials selected for sampling were collected inside the skip. This was because, firstly, a bulk quantity of segregated waste is easier to weigh, as most of these material are light-weight and secondly, containment in a refuse sack prevented any wind-blown displacement.

3.0 Sampling Strategy

3.1 Skip Measurements

All of the Stevenage site skips were to be sampled in order to determine the quantities of packaging waste arising from the ICL site. The issues of time (as the project was to run for three months) and money constraints (as each student was paid a small salary and expenses) had to be addressed and once a review of the different types of waste arisings had been drawn up, a sampling strategy could be designed.

The skips were planned to be sampled the day before they were due to be collected and emptied. This meant that the skips were nearly full, and a relatively representative packaging waste sample could be taken. All the skip's collection dates were entered onto a spreadsheet (this information was gathered from the waste management for disposal contractors). Unfortunately, in practice, it was discovered that the skip collections did not coincide with these dates, but that they were collected as required i.e. when full. This made the fore-planning of skip measurements difficult, but it did mean that the skips could consistently be sampled from when they were almost full.

Some of the skips were discounted either because they were not used for general types of waste, e.g. fluorescent tubes, or because they were already accounted for e.g. white paper recycling skips, for which data was provided by the relevant paper recycler. There were eleven skips to be sampled, all approximately 25-30 ft in length, which posed a large problem in terms of the sheer size and quantities involved. It was decided, therefore, that one quarter of each skip should be sampled on three separate occasions.

This was straight forward to do because each skip was measured and found to have separators that split the skip into four equally sized sections. In this way, the time spent measuring a skip could be kept to a minimum, thus causing as little disruption as possible to those using the skips.

In addition, the process avoided the emptying the whole of a skip at one time, which not only would be highly impractical but also would increase the risk of breaching the Duty of Care. The time saved also meant that the measurements could be taken three times on a weekly basis which provided results that could be extrapolated to give monthly or annual estimates.

3.2 Material Types - Measurands

Sampling involved removing a proportion of the packaging waste held in the skip using a black plastic bag to prevent any escape of the waste. The waste was separated into material types as it was collected, so that each bag contained only one measurand. The material types weighed included card, metal, composites, paper, plastics and miscellaneous (unknown materials and wood). These materials relate to those required to be recovered and recycled as packaging under the legislation. This segregation and collection scheme meant that reasonably large samples (considering the size of the skips and quantities of the waste to be accounted for) could be taken at one time and weighed.

3.3 Weighing Method

The particular material type samples were then weighed on a set of post room type scales (i.e. 0.5 to 40 kilos). The scales were newly bought for the packaging project which meant that not only had they been recently calibrated and set up, but that also they were being used for weighing the 'live' or product packaging. This enabled any fixed bias in the instrument to be counted as irrelevant for the purposes of comparing the data when making the assessment of ICL meeting its legal obligations.

3.4 The Problem of Negotiating Access

One of the skips which was situated in an area known as the lorry park (26.8 m³), was found to be highly compacted and over filled, making sampling difficult. To add to the problem, the access for sampling was only 1m², unless the compactor could be separated from the skip.

After one unsuccessful attempt to take measurements from the skip, the sub-contractors, Shanks and McEwan, were contacted and a request made for them to remove the compactor. Shanks and McEwan raised concerns that any mishandling of the waste would make them liable under the Duty of Care. Corporate Environmental Affairs liaised with the Environment Agency in order to establish that the liability would in fact fall on ICL and not Shanks and McEwan.

Once the sub-contractors were assured of this, they removed the compactor and the measurements were made successfully. It turned out to be extremely useful in bringing to light the fact that the skip was being used for a lot of non-conformant waste.

4.0 System Perturbation

The waste review became common knowledge on the ICL site, and by the time the waste measurement process had been going for about three weeks, it was commented that people had started to recycle more of the waste. In addition to this perturbation, it is likely that the amounts of conformance waste decreased due to this increase in staff awareness.

The second main external influence was that of the contractors. ICL's site facilities contractor, Workplace Management Ltd., became pressured during the waste review process. In addition, various representatives had to attend a workshop held by Corporate Environmental Affairs, to discuss their role in facilitating ICL to meet its packaging waste obligations. This would probably have affected their behaviour and procedures, and that of their sub-contractors.

As mentioned in the previous section (3.4), the sub-contractor Shanks and McEwan had been made aware of the waste audits and were influenced by Corporate Environmental Affairs, and this may well have made them change their behaviour. This was exemplified in the fact that they began to make collections as the spreadsheets had time-tabled, as opposed to when required. These 'on-time' collection lasted for about two weeks and then re-lapsed into the 'as required' collections. This perturbation did not in fact make much of a difference to the end results because care was taken to always sample when the skips were full.

5.0 Conclusions

The precision of the weights taken was excellent in terms of the weights taken, as any weights taken were repeatable. The measurement method gave reasonably high resolution in terms of a monthly result, because the sampling was weekly. In addition, the repeatability of results was good for the three occasions that each of the skips was measured. This indicated that the results were representative of the flow of waste over the month.

However, the extrapolation of this data to an annual turnover gives a result of low resolution and a predictably high degree of error. This would be especially exaggerated by the many factors that would vary the results, such as product line changes and fluctuations in business trade. A comparison made between this annual figure and that of the figures provided by WML showed a large discrepancy. It is hard to define how accurate a figure is provided by contractors as it is in their interests to maximise profits, but the difference in data stands to highlight the level of error.

The purpose of this waste measurement review was to find out whether ICL could use its backdoor arisings to meet its obligations under the packaging legislation. The high degree of error in the annual figure is, therefore, unimportant because the aim was only to discover a ball park figure. The measurements have enabled the discovery of non-conformance waste which has served to explain the high costs of waste disposal at the site.

The measurement has also provided a percentage flow of different types of materials in the waste stream. These percentages can be multiplied by the (higher) figures provided by WML to give estimates on back-door arisings. In this way the use of total figures to extrapolate to yearly flows can be avoided and the purpose of making the measurements fulfilled.

EXECUTIVE SUMMARY

An independent review has been undertaken of the waste management processes occurring on ICL's Stevenage Campus, and to determine the extent of packaging waste (backdoor arisings) on the Campus. Wastes are deposited into a series of Shanks & McEwan and Severnside skips.

Objectives

The overall objectives of the review undertaken for this study are as follows:

- ◆ To assess the degree of compliance to relevant waste management legislation and ICL's Corporate Environmental Statement on waste;
- ◆ To determine to amount of packaging waste on Campus that can be recycled to cover ICL's obligation to the UK Packaging Regulations.
- ◆ To identify areas for improvement and provide recommendations.

Audit Procedures & Criteria

To establish the current status of waste management at ICL Stevenage, this study has involved discussions with ICL Corporate Environmental Affairs, Workplace Management Ltd., and relevant waste managers on Campus. The review has been undertaken using standard proformas and protocol, with discussions having taken place with questionnaires and checklists (see Appendix D). All interviews were pre-arranged.

Sampling of skips was carried out according to a sampling strategy, with measurements taken one day before collection to ensure an accurate weekly figure for each material type was achieved.

General Conclusions.

This study has demonstrated that ICL Stevenage are not in full compliance with some pieces of waste management legislation. In particular, the site is

not complying with its Duty of Care, although this problem can be dealt with quite simply.

However, more general concerns lie in that environmental issues are given very little consideration. This lack of consideration is directly linked to some of the waste management issues that have been highlighted by the Review. On the basis of this Review, it was noted that Corporate Environmental Affairs could improve the dissemination of environmental information to employees, thus improving awareness.

The Review has also determined that it may be possible to utilise backdoor arisings currently occurring on Campus. Data suggests that card, paper, polyethylene and polystyrene material types could be recycled successfully, with reasonable cost effectiveness. However, effective recycling will rely on more space and better trained staff being available to ICL.

On the basis of this report, it is suggested a formal scheme of waste management monitoring be undertaken by a responsible person, and a waste management audit be carried out within the next year.

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1. OVERVIEW

1.1. ICL STEVENAGE CAMPUS

The largest ICL site in the UK is the multi-tenanted Stevenage Campus (the Campus). The Campus is divided into four Sites, these being STE 04, STE 09, STE 10 and STE 14.

- ◆ STE 04 is an office building shared between ICL Sorbus and ICL Retail. It also contains the Site Services offices and the staff restaurant.
- ◆ STE 09 is also an office building, set aside from the main campus. It is used by ICL (UK) Ltd.
- ◆ STE 10 consists of office and warehouse space. These are used by ICL Sorbus and Exel Logistics.
- ◆ STE 14 is the ICL Retail Integration Centre (RIC). A walkway connects the RIC to the ICL Retail offices in STE 04.

1.1.1. ICL Retail

ICL Retail (STE 14) is a world-wide supplier of in-store IT solutions. The Retail Integration Centre (RIC) supports ICL Retail Systems throughout Europe. It installs an average of 400 systems per week in the UK and Europe. The site has a high consumption of packaging.

1.1.2. ICL Sorbus

ICL Sorbus (STE 04) is a multivendor system service provider. Their principal services are help desks, call centres and multivendor system services. Large amounts of white office paper and general waste are produced by the site.

The STE 10 warehouse is the major world-wide distribution point for ICL Sorbus Logistics. Here they handle service delivery for ICL-Fujitsu as well as other major manufacturers like Microsoft, Gateway 2000, AST, and Tandem. STE 10 is another high consumer of packaging.

1.1.3. Site Services

Workplace Management Limited (WML), owned by Chestertons, is contracted by ICL plc to provide site services, indirectly including the provision of waste management on site. WML sub-contract cleaning and refuse collection on the Stevenage Campus to RCO Support Services. RCO Support Services come into direct contact with the Waste Management Companies employed by ICL Stevenage. As such they are required by ICL to ensure the efficient management of waste on the Stevenage Campus, and are likely to be affected most by the new UK Packaging Regulations.

2. REVIEW OUTLINE

2.1. AIM

The purpose of the Waste Review (the Review) was to determine the position of the ICL Stevenage campus with regard to legislative and Corporate environmental standards. The Review assessed waste management and packaging waste issues. The identification and resolution of areas of concern will raise the environmental profile of the Campus by ensuring full compliance with waste legislation and the UK Packaging Regulations with a view to ISO14001 accreditation at a later date.

The scope of the Review therefore concentrated upon:

- ◆ the compliance of the Campus with relevant waste management legislation, in particular ICL's Duty of Care;
- ◆ the compliance of the Campus with ICL's Corporate Environmental Statement concerning waste;
- ◆ the quantification of waste packaging materials arising at ICL Stevenage.

Table 1. Key Personnel Consulted in this Review.

Staff Member	Position
Joy Boyce	Manager, Corporate Environmental Affairs
Gail Collins	Corporate Environmental Affairs
Peter Richardson	Director, Human Resources, Stevenage
Ken Johnson	Manager, WML, Stevenage
Mick Papper	Manager, RCO Support Services, Stevenage
Peter Holmes	External Consultant, ICL Retail
George Trudgill	Materials Controller, ICL Sorbus Logistics

3. WASTE MANAGEMENT REVIEW

3.1. SCOPE

This section of the Review aims to determine the Campus' position concerning compliance with relevant waste legislation, ICL's own Corporate Environmental Statement on waste and attitudes concerning sustainable waste management. Relevant legislation includes:

- ◆ Environmental Protection Act 1990 (Part II),
- ◆ Special Waste Regulations 1996;
- ◆ Controlled Waste Regulations 1991.

Of special concern to the ICL Stevenage management and Corporate Environmental Affairs was compliance with the Duty of Care (EPA 1990, Part II)

3.2. METHOD

The methodology adopted by the Review Team is set out below:

- 1) **Client Meeting.** A briefing was given to the Review Team by Joy Boyce and Gail Collins, ICL Environmental Executive, concerning ICL's activities at the Sites. The scope of the Review was discussed and determined.
- 2) **Preliminary Campus Inspection.** This involved a walkover and visual survey. Activities on the sites were determined and photographs of areas of interest taken.
- 3) **Inspection Review.** Further to the preliminary inspection, the scope was considered at greater detail and specific issues identified.
- 4) **Identification of Relevant Persons.** Persons responsible for the management of waste were identified with the aid of Gail Collins.

- 5) **Protocol Design.** The protocols were designed according to the roles of the key personnel identified.
- 6) **Protocol Interviews.** The Review Team undertook interviews with the relevant persons over the period of three weeks. During the period of the Review a number of follow up interviews were conducted.
- 7) **Assessment.** The information gathered during the investigation was assessed and compared against relevant legislative and Corporate standards.
- 8) **Presentation.** A presentation of principal findings.
- 9) **Final report.**

4. WASTE MANAGEMENT FINDINGS

An inspection was made of all documentation and management practices relating to waste on the Stevenage Campus. The findings are discussed below according to relevant standards identified in Section 3.1.

4.1. ENVIRONMENTAL PROTECTION ACT 1990 (PART II)

Included in the EPA 1990, (Part II), is the Environmental Protection (Duty of Care) Regulations 1991. This Duty of Care requires all persons in the waste stream to take all reasonable steps to ensure controlled waste is handled safely. This includes the correct storage, transfer, transportation and end disposal of Controlled Waste.

4.1.1. Waste Transfer Notes

Under the Duty of Care Regulations a full record of waste transfer between ICL and the Waste Management Company must be kept. This requires Waste Transfer Notes to be used whenever a transfer of controlled waste occurs and the note to be retained for two years.

Information to be detailed on the Transfer Note includes:

- 1) description of waste consigned;
- 2) weight of consignment;
- 3) time and date of the transfer;
- 4) transfer location;
- 5) names and addresses of the consignor and consignee;
- 6) information relating to the consignee such as Waste Management Licence Number;
- 7) Signatures by representatives of the consignor and consignee.

Following investigation the Review Team found that controlled waste transfers were managed by the following waste management companies:

◆ Shanks & McEwan (SME)	General waste
◆ Severnside	Card and white paper
◆ Sav-a-Cup	Polyethylene cups
◆ Alchemy	Aluminium cans
◆ Scrap electronics	Bruce Metals Ltd (STE 14) A.R. Sinclair (STE 10)

There are two areas of concern relating to the use of Waste Transfer Notes. Firstly, the full suite of Waste Transfer Notes for the previous two years were requested by the Review Team. Only the most recent of these were made available, raising questions about the integrity of the back catalogue (Appendix B). Also, signatures relating to the consignor (RCO Support Services) and consignee (the driver) had not been completed as required (Appendix B).

Incorrectly completed Waste Transfer Notes prevent a full audit trail to be traced in the event of a non-compliance somewhere in the waste stream. ICL may be required in the future to prove the content and amount of any transfer of waste in Court, by the presentation of the relevant Waste Transfer Notes. An incomplete or incorrect Waste Transfer Note is itself a non-compliance and can lead to an unlimited fine.

It was noted that no records of transfer were available for the disposal of scrap electronic components (when not designated Special Waste). Transfer Notes are required from the scrap equipment brokers, namely A.R. Sinclair (Royston) and Bruce Metals Ltd. (Sheffield).

4.1.2. Disposal Methods

These companies appear to use suitable methods relating to the disposal of ICL's waste. However, the Review Team believe that further investigation is required into their use of the Best Practicable Environmental Option

(BPEO) when considering the disposal of general commercial and industrial waste.

4.1.3. Storage of Controlled Waste & General Housekeeping

The Duty of Care also requires that Controlled Waste be stored correctly and securely, ensuring that it cannot be released into the environment.

All skips used for the containment of waste were adequate for the amount of waste to be disposed of (26.5m³). Compactors were used on SME enclosed general waste skips, minimising the volume consumed by waste once deposited. The use of compactors also reduces the risk of wind-blown litter occurring. However, lightweight material had escaped and collected under several of the SME skips (Appendix A, Fig 2). This is due to a lack of care given during disposal by Site Services staff and when the skips are being loaded onto the back of SME lorries.

The SME skip (Lorry Park) and surrounding area was found to be a dumping site for waste from the whole campus when other skips had become full. This led to the skip becoming overfilled, with all manner of wastes (including what appeared to be non-ICL waste) spilling out of the compactor (Appendix A, Fig. 3 & Fig 4). The Review Team believe this is due to the isolated positioning of the skip. Consequently, when non-ICL waste is deposited there it is not noticed by Site Services.

The area surrounding the Lorry Park skip lacked any containment, allowing litter to be blown around the car park and into the surrounding neighbourhood.

A number of vending machine cups were blowing around waste disposal area when these should be collected up and recycled by Sav-a-Cup.

Sevenside skips used for card recycling contained well stacked card, minimising the likelihood of card escaping and littering the campus (Appendix A, Fig.5) On one occasion card had been stacked outside of the Sevenside skip at STE 10 due to the skip being full. This card was then subject to poor weather conditions (Appendix A, Fig 6).

The type of skip used to receive white paper waste at STE 04, operated by Sevenside, was of particular concern because it had open doors which allowed the escape of waste as the skip became full.(Appendix A, Fig.7)

It is a requirement of the Duty of Care to prevent the escape of wastes. Non-compliance can lead to an unlimited fine. The escape of such lightweight wastes could also lead to negative publicity by ICL's neighbours.

4.2. SPECIAL WASTE REGULATIONS 1996

A number of extra control measures are required for the handling, storage, transportation and end-disposal of Special Wastes. This includes the use of Consignment Notes for waste transfers and more stringent waste storage facilities.

4.2.1. Special Waste Consignment Notes

Environment Agency Special Waste Consignment Notes are required whenever these wastes are disposed. Information on the note must include:

- 1) the Environment Agency Consignment Note Code;
- 2) full description of the waste consigned;
- 3) the waste's hazardous properties using prescribed codes;
- 4) the weight of the consignment;
- 5) time and date of transfer;
- 6) location of transfer;
- 7) names and addresses of the consignor and consignee;
- 8) information relating to the consignee such as correct Special Waste transport and disposal Licensing;

9) signatures of representatives of consignor and consignee.

Consignment Notes are not required if the Special Waste is diluted within a large volume of Controlled Waste.

A number of Special Wastes were found around the Campus. These included a skip containing fluorescent tubes, large amounts of unserviceable electronic equipment such as cathode ray tubes (CRTs), COSHH-regulated substances such as cleaning materials, and a small number of drums containing spent cooking oil. All these waste types require the use of Special Waste Consignment Notes.

4.2.2. Use of Special Waste Consignment Notes

The Review Team attempted to trace a full suite of relevant documentation (Consignment Notes) for the Special Wastes identified. However, upon request no Notes were supplied and it is the belief of the Team that Consignment Notes are not being used.

If Consignment Notes are not used, incorrect disposal could ensue or the waste could pose a health hazard to any person coming into contact with it. This presents a source of liability to ICL, WML and RCO Support Services and could lead to an unlimited fine.

It is accepted by the Review Team that in the case of scrap equipment carcinogenic compounds in CRTs could be present only in small quantities within Controlled Waste (such as scrap plastic and metal). In this case only a Waste Transfer Note would be required. Further clarification concerning the content and classification of this waste arising is required. The disposal of cleaning materials are not believed to require Consignment Notes due to their dilution by Controlled Waste in skips.

4.2.3. Storage Areas

An approved Code of Practice exists concerning the correct storage of Special Wastes. The Review Team investigated current storage practices of

the identified Special Wastes and compared the findings to standards set by the Code of Practice

4.2.3.1. Fluorescent Tubes

Spent fluorescent lighting tubes were disposed of in a small (approx 10m³) open skip, supplied by Porters (Appendix A, Fig. 8). The skip lid was secure as suggested by the Code of Practice. However it was not locked, allowing limited access to the skip contents. Lockable skips should be introduced.

The presence of fluorescent tubes on the ground near the skip was of concern. The Review Team's findings were presented to the Environmental Executive at an interim meeting at LON 11. Subsequently, the tubes were removed within two days. Incorrect storage of waste in this manner contravenes ICL's Duty of Care and legislative controls set down by the Special Waste Regulations 1997. This could result in legal action taken against ICL (or its sub-contractors).

Porters, the end-disposer of fluorescent tubes, were contacted concerning their disposal practices on several occasions. However, the Review Team were not furnished with these details. Further investigation to determine Porters' disposal methods may be required. However, ICL and WML may find it beneficial in the future to replace these tubes with less hazardous types.

4.2.3.2. Electronic Components

Scrap, unserviceable electronic components such as computer monitors and motherboards are currently disposed of through two scrap brokers; A.R. Sinclair (Royston) for ICL Sorbus and Bruce Metals Ltd. (Sheffield) for ICL RIC.

In the case of ICL Sorbus at STE 10 waste is stored outside until collection, uncovered and exposed to poor weather conditions (Appendix

A, Fig 9 & Fig 10). Some components include CRTs which contain known carcinogens. The Review Team's concerns relate to the contents of these leaching across the STE 10 yard and causing a hazard to workers. Further investigation may be required to determine what materials may be leaching from the waste.

Storage of scrap electronic equipment within the warehouse at STE 14 appears to be sufficient, as it is out of the influence of poor weather conditions.

4.2.3.3. Waste Cleaning Material Containers

Although these materials will not require the use of Consignment Notes as mentioned, as COSHH classified materials they require storage as Special Wastes. These materials are stored in locked cupboards as required, limiting unauthorised staff access.

4.2.3.4. Waste Cooking Oil

A number of waste cooking oil drums were observed behind STE 04 in the waste disposal area. Some of the drums were corroded and likely to leak. The ground surrounding the drums was darkened by previous oil leaks due to the lack of bunding around the drum storage area. This could lead to oil entering drains surrounding the disposal area and causing blockages if congealed. It is not clear whether these oil drums present a possible liability in such small numbers but they should be stored in a better manner.

The management of Special Wastes on-campus is, in general, insufficient even when considering their minimal presence.

4.3. REGISTRATION OF CARRIERS AND SEIZURE OF VEHICLES REGULATIONS 1991

Electronic scrap is collected from clients by field engineers and Sorbus Logistics. Under the EPA 1990 Part II these materials are considered Controlled (or Special) Waste.

If as part of ICL's business, a carrier (such as a field engineer) transports Controlled Waste, it is required that the carrier is licensed to do so. ICL, as a company, can and should immediately register as a Licensed Waste Carrier. ICL can be fined £5000 if found carrying Controlled Waste (such as scrap electronics) without a Waste Carrier's Licence.

4.4. CORPORATE STANDARDS

ICL's Environmental Policy on Waste set down under the Corporate Environmental Statement states that:

"ICL will minimise waste produced in all parts of the business and aim for continual waste reduction".

The Review Team considers, after investigation, that the Policy is not adhered to when considering waste reduction.

Attitudes to waste minimisation strategies, such as reuse and source reduction of packaging, catering and office waste, are variable. A large amount of office waste and wooden pallets in particular, was being disposed of needlessly and without consideration of other options, such as reuse or recycling (Appendix A, Fig. 11).

The Review Team calculated that STE 10 dispose of approximately 50 tonnes of wooden pallets per annum, which illustrates the attitudes of staff to waste minimisation. This source of wood presents a useful source of revenue and, to some extent, an opportunity to reuse.

The Review Team believe that staff at ICL Stevenage are not fully aware of the Corporate Environmental Statement and the issues it raises concerning sustainable waste management. It also appears that the staff treat waste issues with a lack of sensitivity.

This lack of sensitivity for sustainable waste and general environmental issues could be due to the lack of information and training available at the site.

4.5. OTHER ISSUES

There are a number of issues highlighted by the Review Team that, although not required under legislative or Corporate standards, may be worthwhile investigating further.

4.5.1. Landfill Tax

Issues highlighted by the Review Team include lack of data concerned with waste amounts present in skips across the whole campus and the lack of control measures concerning access to skips. These concerns relate to the impacts of Landfill Tax upon ICL.

General waste disposed of into SME skips is not logged in any way. When the skips reach their disposal point (SME Arlesey), the weight of waste is logged by SME and Landfill Tax applied to the cost of the service. Currently ICL are not kept aware of the weights produced, thus Landfill Tax paid by ICL cannot be quantified.

Domestic and non-ICL waste has been disposed of in the SME Lorry Park skip on Campus. This is due to lack of skip security on the Campus and leads to extra Landfill Tax being paid by ICL.

The use of landfill for the disposal of catering waste is successfully minimised by the use of a waste disposal unit in the kitchens at STE 04.

4.5.2. Available Space

There is a lack of space on the site for efficient waste management and inefficient use of available space. This was particularly evident at the STE 04 and STE 10 sites, where up to four large (26.5m³) skips had been placed in areas no greater than 600m². These areas were often congested

with vehicles due to the areas' multi-purpose use (Appendix A, Fig 12). Space at STE 10 was further restricted by a large number of new and broken wooden transit pallets (Appendix A, Fig. 11)

If ICL decide to increase the number of skips in these areas without re-evaluation of available space problems will arise.

4.5.3. Staff Training

Staff involved directly with waste management were unaware of their responsibilities relating to legislative and Corporate standards. It is understood that staff receive little training in the relevant legislation such as the EPA Duty of Care. An improvement in training could lead to effective waste management at the Campus.

4.6. SUMMARY FINDINGS

The following list of findings are those considered to be of greatest concern

4.6.1. Waste Transfer Notes

A full two year record of Transfer Notes does not appear to be held by WML or RCO Support Services. This contravenes the requirements of the Environment Agency and is a source of liability for ICL.

Incorrect use of Transfer Notes relating to required signatures was observed. ICL are not complying to the requirements or the Duty of Care as a result, which also represents a possible liability in the event of a court case.

4.6.2. Housekeeping

In general housekeeping on site is adequate. However, a lack of care during disposal and skip collection has led to the escape of waste from skips. As a result, wind blown litter is a problem around disposal areas and contravenes ICL's Duty of Care.

4.6.3. Controlled Waste Storage

Storage of waste on the Campus is adequate. However, in the case of the Severnside white paper skip (STE 04) the skip is open and unlocked. This has led to an escape of white paper waste and therefore is not suitable for its purpose.

The Lorry Park SME skip and surrounding area is currently used as a dumping ground for general office, electronic and domestic waste due to its isolated position. Therefore it is often overfilled, resulting in waste spillage and unnecessary Landfill Tax costs. Additionally, the anodised coating from scrap electrical waste stored in the Lorry Park was seen to be leaching across the car park (Appendix A, Fig.13 & Fig 14).

4.6.4. Consignment Notes

Consignment Notes are not being used for the disposal of Special Wastes such as fluorescent tubes. This is a possible source of liability for ICL and represents a possible hazard for those subsequently handling the waste.

4.6.5. Special Waste Storage

Fluorescent tubes were left lying around the waste compound (STE 04). This Special Waste must be securely stored.

There is no bunding for the storage of spent oil (STE 04). This could lead to spillage into drains.

There is no provision for the covered storage of possible hazardous waste in the form of scrap IT equipment and CRTs (STE 10). This could lead to leaching of the materials across the STE 10 yard.

4.6.6. Registration of Field Engineers as Waste Carriers

ICL collect unserviceable electronic equipment (Controlled or Special Wastes). This requires the correct Registration and Licence from the Environment Agency. This is required by law and represents a source of liability.

4.6.7. Corporate Standards

Requirements of the ICL Corporate Environmental Statement on Waste have not been attained. In particular, reuse and recycling is carried out on a small scale on the Campus.

Poor reuse is particularly well illustrated by the 50 tonnes of wooden pallets that are disposed of to landfill every year. The aims of the Statement are not fully disseminated across the site.

4.6.8. Staff Training

There is inadequate training of staff responsible for waste management at Stevenage. This is illustrated by the lack of care shown during disposal, allowing waste to be spilled, and incorrect completion of Waste Transfer Notes. RCO Support Services and WML need to instruct their operatives in complying with Duty of Care while carrying out their responsibilities.

4.6.9. Other Issues

The space available for effective waste management is insufficient and the absence of records concerning Landfill Tax costs is significant.

Failure to undertake correct waste segregation is costing ICL excessively in the frequent removal and subsequent disposal of the contents of SME skips

4.7. RECOMMENDATIONS

Based on the findings of this section of the Review the following recommendations are made.

4.7.1. Documentation

ICL need to investigate its waste streams further to identify where documentation, such as Transfer Notes and Consignment Notes, is required. ICL must also register as a Waste Carrier for scrap electronic waste or ensure a Registered firm collect their electronic waste from their customers.

4.7.2. Staff Training

Problems concerning Waste Transfer Notes, Consignment Notes, and Duty of Care issues could be effectively dealt with by ensuring RCO Support Services staff are correctly trained.

WML and RCO Support Services themselves should be responsible for carrying out training. Periodic review training should be carried out to ensure staff keep abreast of changes in waste regulation and ICL's own requirements.

Emphasis should be put, at this stage, on the importance of all staff abiding by the necessary management practices, and that failure to follow procedures could result in dismissal.

This training could be extended to key members of staff on the Campus to change attitudes towards sustainable waste management.

4.7.3. Record Keeping

Ensure all documentation is used and retained for two years as required. A responsible person should be appointed to ensure the catalogue is complete at all times.

It is suggested that only WML or RCO staff sign and complete the relevant waste documentation, as this is currently done by Security. As waste documentation constitutes a legal contract between the producer and the keeper or disposer of the waste the Notes need to be completed by a trained and responsible person.

4.7.4. Waste Management Responsibilities

A responsible person should be employed to ensure monitoring of waste management practices and that ICL meet all required compliance standards. This person should report directly to the Site Services Manager and Corporate Environmental Affairs when necessary. Every person using the waste disposal facilities on the Campus should be made aware of who this person is and where they can be contacted.

Waste deposited into skips should be regularly monitored to minimise unnecessary Landfill Tax costs. An action plan should be identified to rectify the disposal of non-conformant wastes (such as non-ICL waste and undiluted Special Wastes in a Controlled Waste skip).

4.7.5. Internal Auditing

Nominated staff should be trained to carry out regular internal audits of the Campus and a log kept of the audits. No monitoring of waste management practices at the Campus occurs at present. As a result there are no comprehensive waste management practices employed.

The nomination of a trained member of staff to waste management auditing and reporting could also form an integral part in developing a system for environmental reporting on Campus.

A meeting of all staff responsible for waste management should be arranged on a regular basis to provide a forum for reporting and feedback from all levels on waste management issues.

4.7.6. Removal of Lorry Park Skip

The SME skip behind the Lorry Park should be removed. It is an unnecessary source of additional Landfill Tax costs due to poor monitoring. (Appendix A, Fig 15)

4.7.7. Characterisation of Scrap Material

Characterisation of scrap IT equipment is needed as disposal methods are not checked. Hazardous CRTs and components containing heavy metals should be separated from non-hazardous components wherever possible. If ICL are to minimise possible liabilities, this waste arising must be fully monitored.

4.7.8. Other Issues

It is suggested that more space be made available for waste management, particularly in STE 04 and STE 10. This could be afforded by the removal of unnecessary transit pallets. The transit pallets could be sold off or repaired, thus minimising purchasing and disposal costs.

5. PACKAGING WASTE REVIEW

5.1. SCOPE

This section of the Review aims to determine the amounts and types of packaging material arising in waste skips on the Stevenage Campus. Data relating to packaging waste will allow ICL to determine opportunities for the recycling and reuse of packaging materials on the Campus. There is the possibility of using the waste packaging materials (known as 'backdoor arisings') to ensure ICL's compliance with UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997.

The legislation must be complied with by 31st August 1997 so the opportunity for the recycling or reuse of backdoor arisings must be determined.

5.2. METHOD

Due to the requirements of this section of the Review no protocols or interviews were deemed necessary.

- 1) **Client Meeting.** A briefing concerning the possibility of utilising backdoor arisings was given to the Review Team by Joy Boyce and Gail Collins, ICL Environmental Executive. The scope of the Review was defined as the quantification of backdoor arisings.
- 2) **Preliminary Skip Inspection.** This involved a visual survey of the skips on Campus and determining to which business they belong. The positions of the skips were mapped.
- 3) **Development of Sampling Strategy.** Based on skip logistics and ensuring Duty of Care compliance.
- 4) **Investigation.** Application of sampling strategy to skip contents.
- 5) **Presentation.** Graphical representation of data.
- 6) **Final Report.**

6. PACKAGING WASTE FINDINGS

A review of packaging waste (backdoor arisings) present in skips on the Stevenage Campus was carried out. Data produced from this part of the Review is applied to recommendations to allow ICL to recycle this waste arising, as required by the UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997.

Sampling of skips for material type weights was carried out one day before collection by the relevant waste management company. The data quoted in this section relates to maximum average amounts present in skips over the period of the Review. Material types included card, plastic types, paper, composite and miscellaneous. Composites were packages made from two or more inseparable material types, miscellaneous being either non-packaging or unknown material types (Appendix C, Table of Results).

6.1. STEVENAGE 04

6.1.1. Skips Present

Three skips were seen in the waste disposal compound:

- ◆ One SME 26.5m³ general waste skip and compactor, enclosed;
- ◆ One Severnside white paper skip (similar volume to above), enclosed, unlocked walk-in;
- ◆ One Porters fluorescent light tubes mini skip, enclosed.

Only the SME and Severnside skips are of concern in this part of the Review. The SME skip was sampled three times and an average weight of material type calculated.

6.1.2. Material Types

Packaging material types within the SME skip were mainly card with some plastics. Card was most prevalent due to the disposal of computer boxes from STE 04 offices and packaged goods delivered to the kitchens.

The maximum weight of card present in the STE 04 SME skip ranged from 85 to 140kg, and between 7 and 23kg of plastics were present. The plastic types were typically polyethylene bags and polystyrene inserts.

6.1.3. White Paper

Sevenside furnish WML with weights once the skip is emptied and recycled. The skip had not been collected and emptied during the period of reviewing. The white paper skip appeared to be cross contaminated with plastic, minimising the residual value of the material (Appendix A, Fig.7).

6.1.4. Conclusions

The SME skip at STE 04 does not appear to be an important source of backdoor arisings as only relatively small amounts of card are present. This is due to the nature of the STE 04 site (office space). There is not enough card to warrant a card-only skip.

6.1.5. Recommendations

Current disposal practices relating to card should be altered, with the card being recycled whenever possible. By doing so the SME skip could yield up to six tonnes of card per year. Card produced on this site could be collected and used to supplement one of the Sevenside card-only skips elsewhere on the site, such as at STE 10 or STE 14. Recycling of plastic waste arisals in the STE 04 skip appear to be too impractical to implement due to the small quantities present.

6.2. STEVENAGE 09

6.2.1. Skips Present

Only one skip was being used to receive backdoor arisings; a small closed top SME mini skip. This was sampled once due to its slight importance as a source of backdoor arisings (Appendix C, Stevenage 09).

Another SME skip was present, this being large and open topped. It appeared that this skip was being used to receive wood scrap and some building waste. Due to its unimportance as a source of backdoor arisings this skip was not sampled.

6.2.2. Material Types

There was a small amount of backdoor arisings present in the STE 09 skip. These were in the form of card boxes (12kg) and polyethylene bags containing some white paper, alongside putrescible wastes from the kitchens on site (51 2kg).

6.2.3. Conclusions

There is little opportunity of using the STE 09 SME mini skip as a source of backdoor arisings. During the period of this review the skip was inspected for its contents every week and the presence of packaging waste was sporadic.

6.2.4. Recommendations

The Review Team consider it impractical to undertake recycling of card on site due to the variable amounts of card produced. However, it may be worthwhile to supplement the Severnside card recycling skips on the main Stevenage Campus with card waste produced on the STE 09 site.

Recycling of white paper on the STE 09 site could be implemented by supplying a small closed-top mini skip.

6.3. STEVENAGE 10

6.3.1. Skips Present

Four skips were present in the warehouse yard of the STE 10 site, those being:

- ◆ One SME 26.5m³ general waste skip with compactor, enclosed;
- ◆ Two SME 26.5m³ skips for wooden pallets, open top and walk-in;
- ◆ One Severnside 26.5m³ skip for cardboard, enclosed, walk-in.

Only the SME compactor skip present in the STE 10 yard yields backdoor arisings. The Severnside skip already used for card packaging waste recycling will also be considered in this Section (Appendix C, Stevenage 10 Total)

6.3.2. Material Types

The SME general waste skip was found to be a large source of backdoor arisings, with high weights of all materials being present.

6.3.2.1. Card

Total weekly amounts of card packaging were in the region of 145 to 225kg. Over the period of a year between 7.5 and 11.5 tonnes of card could be retrieved from the skip as a recyclable backdoor arising.

6.3.2.2. Plastics

Total plastics sampled amounted to between 55 and 112kg. Over the period of a year this could amount to between 3 and 6 tonnes. Individual plastic types were sampled, these being polyethylene (PE), polypropylene (PP), polyurethane (PU), polystyrene (PS), and expanded polystyrene (EPS).

PE was found in large amounts and, due to its greater density, also related to a fairly large mass. Amounts found varied between 40 and 76.5kg,

which relates to between approximately 2 and 4 tonnes per year. PE was being used mainly as bubble wrap packaging inserts, but was also found in the form of pallet wrap, plastic cups and black refuse sacks.

PP was found in small amounts in the skip. The amounts found varied between 4 and 13kg, which relates to a yearly amount of approximately between 370 and 620kg. PP was being used as strapping to surround and hold pallet wrap.

PU was also sampled in small amounts. The amounts varied between 3.2 and 16.8kg, amounting to a yearly amount of approximately between 165 and 875kg. PU was being used as high density foam inserts for cardboard boxes and cardboard composite sleeve inserts.

PS was found in high quantity, but did not relate to a high mass, due to its density. Amounts found were between 4.4 and 6kg, which equates to between 230 and 310kg per year. PS was being used mainly as a packaging insert inside large cardboard computer boxes.

EPS was found in the form of small, lightweight packing chips. ICL Sorbus Logistics minimise its use wherever possible so it made up the least amount of plastics found in the skip. Amounts found were between 0.4 and 1kg, which equates to between 32 and 52kg per year.

6.3.2.3. Other Materials

Other non-plastic and card backdoor arising materials included composites and paper. Composites were sampled in low amounts but were seen in greater number than many plastic types. Composite amounts varied between 8 and 39kg, which relates to a yearly total of between 400kg and 2 tonnes.

A high proportion of the paper in the STE 10 skip was found to be 'pick notes'. Pick notes are four sheets of A4 self-carbonating paper that.

contain information about package contents and destination. However, if the package is destined for use in the UK only two sheets are required. The other sheets are disposed of in the skip.

Composites were generally paper/polyethylene 'Jiffy'-type padded bags. Paper was found in large quantities in the skip, with weekly amounts of between 65 and 115kg. This amount of paper relates to between 3.4 and 6 tonnes annually.

6.3.2.4. Miscellaneous

A small amount of miscellaneous waste was found in the skip, with weekly amounts varying widely. This arising consisted of PE bags containing mixed catering waste with paper and some electronic equipment.

6.3.3. Card Recycling

Card is currently recycled on the STE 10 site, undertaken by Severnside who provide a large open ended skip. An estimate by the Review Team suggests that currently 500kg of card are recycled per fortnight. Over the period of a year approximately 27 tonnes of card are recycled from this skip. This could be increased to approximately 40 tonnes if card is more effectively recycled rather than disposed of into the SME skip (Appendix A, Fig. 16).

During the period of the Review card in the skip was at times poorly stacked. This limits the amount of card that can be placed in the skip for recycling. As a result, card was found stacked behind the skip, allowing it to get wet, or possibly be blown around the yard (Appendix A, Fig. 6). The skips provided were corroded in places, enabling rainwater to enter the skip.

6.3.4. Conclusions

STE 10 is an important source of backdoor arisings with large volumes of all materials, in particular card and paper, present in the skip. This is due to

the nature of the processes carried out on the STE 10 site, with large amounts of packaging entering the site

On the basis of this review, total backdoor arisings from STE 10 amount to between 363 and 663kg during sampling. This gives a yearly backdoor arisings of between 19 and 35 tonnes per year.

Excessive amounts of card is entering the SME skip rather than being deposited in the Severnside skip for recycling (Appendix A, Fig 16.)

6.3.5. Recommendations

6.3.5.1. Card

On the basis of sampling the STE 10 SME skip the Review Team suggest that ICL ensure as much card is recycled as possible. One area of concern is why RCO Support Services staff are placing good quality card in the SME skip when it should go in the Severnside skip. RCO Support Services staff must change their attitude towards sustainable waste management. This could be achieved either by training or by implementing a recycling bonus scheme (see Section 6.6, Summary Recommendations).

The STE 10 site should be provided with a card granulator. This will enable card to be stored without consuming excessive space and also allows ICL to gain a better fee for the card by reducing the regularity of collections from the recycling firm.

It is suggested that the use of card-polyurethane composite packaging materials be minimised. These materials could be separated before being recycled, but this would present a large source of inefficiency in the recycling process.

The STE 10 site should consider revising its use of card for packaging in the future, perhaps by implementing the use of packaging with an extended life-cycle.

6.3.5.2. Paper

Due to the large amount of paper that is entering the waste stream through the SME general waste skip, it is suggested that a lockable small white paper skip be provided and that a recycling collection service be implemented through a suitable company. Extra paper recycling bins should be made available across the site, to enable more people to recycle their paper.

The system used for the printing of pick notes should be changed. The size of paper used for the information present is excessive. A separate printer stream for UK issues using two ply notes could be implemented. Investigation into the possibility of an electronic bar-code tagging system to replace pick notes entirely is also recommended.

The Review Team understand that the white paper skip at STE 04 is used to receive paper from the entire campus. This is clearly not working efficiently so provision of a paper skip would improve paper recycling.

The reduction of paper consumption should be considered, rather than merely recycling used paper. Paper waste minimisation strategies such as the use of electronic mail and the use of floppy disk memos should be considered wherever possible.

The current practice of double side photocopying and printing is commended by the Review Team and should be expanded where possible.

6.3.5.3. Plastics

The site may be able to implement some form of plastics recycling on site. This would require a number of smaller skips to be placed on site, one for

each plastic type. A full cost-benefit analysis should be conducted before this is implemented, due to the cost implications involved in separating small quantities of plastic backdoor arisings and in providing space for skip placements.

To ensure efficiency, training and also some form of recycling bonus scheme should be implemented (see Section 6.6, Summary Recommendations).

6.3.5.4. Other Issues

A more sustainable view towards packaging should be implemented on the site, such as reducing the amount of packaging consumed or purchasing reusable packaging that can be recycled at its end-of-life.

The site is beginning to implement packaging waste minimisation strategies such as the use of plastic Tea Crates over cardboard boxes. These actions are commended and should be expanded upon where feasible.

The greatest opportunity for waste minimisation is the repair and reuse of wooden pallets on site. Implementing such a waste minimisation strategy would represent a large step towards sustainable use of packaging and could achieve a large cost saving. This recommendation should be adopted as soon as possible due to the possibility of wooden pallets being included in the UK Packaging Regulations in the year 2000.

6.4. STEVENAGE 14

6.4.1. Skips Present

Three skips were present on the STE 14 site, these being:

- ◆ One SME 26.5m³ general waste skip with compactor, enclosed;
- ◆ One Severnside 26.5m³ skip for card, unlocked, walk-in;
- ◆ One Severnside skip for bagged, granulated card, open top.

Only the SME general waste skip yields backdoor arisings, although the Severnside card skips will also be considered in this Section (Appendix C, Stevenage 14 Total).

6.4.2. Material Types

The STE 14 SME general waste skip was found to be an important source of backdoor arisings. The main types of backdoor arisings were card and polyethylene.

6.4.2.1. Card

Card is an important source of backdoor arisings in the SME skip. Total weekly amounts were between 132.5 and 256kg. Over a period of a year this amounts to between 7 and 13.5 tonnes of recyclable card backdoor arisings that should be deposited in the Severnside skips.

6.4.2.2. Plastics

Plastics were also found to be an important source of backdoor arisings. Total weekly amounts ranged from 125 to 149.5kg. Over the period of one year total plastics range from 6.5 to 8 tonnes per year. Individual plastic types were also sampled, including polyethylene (PE), polypropylene (PP) polyurethane (PU), polystyrene (PS) and expanded polystyrene (EPS).

PE was found in large quantities with weekly totals ranging from 50 to 70kg. Annual totals are likely to be between 2.6 and 3.5 tonnes. PE was found mostly as bubble wrap but also as pallet wrap, black refuse sacks and disposable plastic drinking cups.

PP was found in amounts ranging between 7.5 and 10kg, a comparable figure to that for STE 10. Approximate annual totals are likely to range from 390 to 520kg. PP was found to be employed as banding for pallet wrap.

PU was found at STE 14 in considerably greater amounts than at STE 10. Weekly totals range from 15 to 29kg, with annual amounts likely to range from 780kg to 1.5 tonnes. PU was found as high density foam inserts for card computer and monitor boxes and inside sliding sleeve boxes.

PS was also found in larger quantities than other skips with weekly totals ranging from 30 to 37.5kg. This amounts to an annual total ranging from 1.5 to 2 tonnes, significant considering the low density of this material PS was found as inserts for cardboard boxes.

EPS was found in larger quantities than other skips with weekly totals ranging from 8 to 15kg. This amounts to an annual total ranging from 416 to 780kg. This is a large mass when considering the density of this material. Like STE 10, use of this packaging type is minimised due to its lightweight nature. EPS is used as infill chips for computer boxes.

6.4.2.3. Other Materials

Other materials present in the SME skip at STE 14 included composites and paper. Composites were found in quite large amounts with weekly totals ranging from 7.5 to 46.5kg. Annual totals are likely to range from 390kg to 2.4 tonnes. Composites were typically paper and polyethylene 'Jiffy'-type bags and card-polyurethane sliding sleeve boxes. Paper disposed of into the SME skip was comparable in weight to that in STE 10 with weekly totals ranging from 64 to 113.5kg. Annual totals are likely to range from 950kg to 2.4 tonnes.

6.4.2.4. Miscellaneous

Miscellaneous materials related to catering wastes in black PE refuse sacks and electronic equipment. Weekly totals amounted to between 9 and 22.6kg Annual totals would be expected to range from 470kg to 1.2 tonnes.

6.4.3. Card Recycling

Card is currently recycled on the STE 14 site by Severnside, who provide one large open ended skip for flattened boxes and one open skip for bagged and granulated card (Appendix A, Fig 17) Card is likely to be more effectively recycled at this site due to the availability of two skips and a card granulator on site. About 500kg of card are recycled every fortnight which amounts to 26 tonnes per year. This could be increased up to 40 tonnes per annum if card disposed of into the SME skip was included.

Ungranulated card placed in the Severnside skip had been flattened effectively, allowing as much card to be stacked as possible. However, the open topped skip for the storage of bagged granulated card was insufficient. Rainwater was able to enter the tops of the bags and cause the card to rot thus reducing the value of the card.

No reason was given as to why waste card was not always granulated.

6.4.4. Conclusions

The SME general waste skip is an important source of backdoor arisings. STE 14 yielded a 55% larger proportion of plastic backdoor arisings compared to STE 10. This was due to the processes undertaken in the Retail Integration Centre, whereby plastic inserts provided with incoming packages are unsuitable for reuse.

Total weekly backdoor arisings for the STE 14 skip range from 351.5 to 484kg. Annual totals range from 18.2 to 25.2 tonnes, mostly in the form of plastics and card.

Too much card is being deposited into the SME skip when it should be either flattened or granulated and placed in one of the two Severnside skips. An RCO member of staff suggested that this was due to time constraints as the Severnside skips are at the other end of the STE 14 yard,

and the fact that the granulator equipment cannot deal with large boxes. Another member of staff pointed out, however, that card was deposited into the SME skip more readily on Friday afternoons and during bad weather. This suggests a general lack of consideration given to card recycling.

On one occasion the open top Severnside skip was being used to receive general household scrap such as furniture and electronic equipment (Appendix A, Fig. 18). This meant that the granulator was not being used at all and that Severnside were picking up useless rubbish for which their service does not cater. This appears to illustrate the importance placed on recycling issues on site at present.

6.4.5. Recommendations

6.4.5.1. Card

The current practice of placing good quality recyclable boxes into the SME skip should be stopped. The use of the granulator should be maximised if possible, although it is understood it is only effective on smaller boxes. Changing the granulator equipment currently on site for a model with a greater capacity may be worthwhile.

RCO Support Services staff must change their attitude towards sustainable waste management. This could be achieved either by training or by implementing a recycling bonus scheme (see Section 6.6, Summary Recommendations).

Minimising the use of card-polyurethane composite packaging materials is suggested. These materials can not be recycled as they stand.

The STE 14 site should consider revising its use of card for packaging in the future, perhaps by implementing the use of packaging with an extended life-cycle.

6.4.5.2. Paper

Due to the large amount of paper that is entering the waste stream through the SME general waste skip, it is suggested that a lockable small white paper skip be provided and that a recycling collection service be implemented through a suitable company. Extra paper recycling bins should be made available across the site to enable more people to recycle their paper efficiently rather than using the white paper skip at STE 04.

The reduction of paper consumption should be considered wherever practical rather than merely recycling used paper. Paper waste minimisation strategies such as the use of electronic mail and the use of floppy disk memos should be considered. Practices carried out by STE 10 such as double sided photocopying and printing are commended by the Review Team and should be implemented at the STE 14 site where possible. The practice of printing out electronic communications should be phased out.

6.4.5.3. Plastics

The site may be able to adopt some form of plastics recycling on site, particularly for polyethylene and polystyrene which are present in fairly large quantities. This would require a number of smaller skips to be placed on site, one for each plastic type. Again, a full cost-benefit analysis should be conducted before this is implemented due to the cost implications involved in separating small quantities of plastic backdoor arisings.

It is likely that plastics recycling at STE 14 would be easier to implement than at STE 10. This is due to the large amounts of plastics produced on site and the large amount of available space at STE 14.

To ensure efficiency, training and also some form of recycling bonus scheme should be implemented (see Section 6.6, Summary Recommendations).

6.4.5.4. Other Issues

As with STE 10, a more sustainable view towards packaging should be implemented on the site such as reducing the amount of packaging consumed, or purchasing reusable packaging that can be recycled at its end-of-life.

No change in packaging policy was noted on site, such as the use of plastic Tea Crates over cardboard boxes. Where feasible this policy should be implemented and encouraged.

6.5. LORRY PARK

One SME 26.5m³ enclosed compactor skip was found in the Lorry Park, behind the STE 10 warehouse. The skip is emptied only every six to eight weeks and was sampled once during the progress of this Review (Appendix C Lorry Park).

6.5.1. Material Types

The major material types found in the SME skip were card and polyethylene. However, as this skip is emptied periodically the weekly and annual backdoor arisings yielded could be quite low.

6.5.1.1. Card

The total maximum amount of card found in the skip was 522.8kg. Over a period of a year this amounts to around 4.5 tonnes of recyclable card backdoor arisings.

6.5.1.2. Plastics

The total amount of plastic found in the skip was 78.9kg. Over the period of one year total plastics amount to approximately 686kg. This is a relatively insignificant amount compared to other skips on the Campus.

PE was found in large quantities, with a total of 34kg. This amounts to an approximate annual total of 295kg. PE was found mostly as bubble wrap

and also as pallet wrap, black refuse sacks and disposable plastic drinking cups

PP was found in low quantities with a total of 2kg being present. This gives an approximate annual total of 35kg. PP was found as banding for pallet wrap.

PU was found in similar amounts as STE 10 and STE 14, with a total of 17.6kg being present. This gives an approximate annual total of 153kg. PU was found as high density foam inserts for card computer and monitor boxes and inside sliding sleeve boxes.

PS was found in larger quantities than other plastic types, with total of 24.8kg. This amounts to an approximate annual of 215kg, quite large considering the light weight of this material. PS was found as inserts for cardboard boxes.

EPS was found in less quantity than other skips, with a total of 0.5kg. This amounts to an approximate annual total of 4kg. This small mass is probably due to its minimal use across the site. EPS was found as packaging infill.

6.5.1.3. Other Materials

Other materials present in the SME skip at STE 14 included composites and paper. Composites were found in quite large amounts, with 24kg being present. This amounts to an approximate annual total of 210kg. Composites were typically paper and polyethylene 'Jiffy'-type bags and card-polyurethane sliding sleeve boxes. Paper disposed of into the SME skip was comparable in weight to that in STE 10, with the total sampled being 75.6kg. The annual total is calculated to be 660kg.

6.5.1.4. Miscellaneous

Miscellaneous materials related to catering wastes in black PE refuse sacks and electronic equipment, with a number of non-conformant arisings. The total miscellaneous material sampled amounted to 748.8kg. Due to the varied nature of the waste an annual total cannot be ascertained.

Non-conformant wastes included a bicycle, various pictures, furniture, gardening wastes, building rubble, carpet and household electrical goods.

6.5.2. Conclusions

The Lorry Park skip is a minor source of backdoor arisings and contained mainly miscellaneous and non-conformant wastes. These arisings occur due to the isolated nature of the skip. It appears that staff are dumping their household waste in the skip.

Total backdoor arisings were 701.3kg which amounts to an annual total of 6 tonnes per year, of which the greatest proportion is card. However, the skip contains half as much again non-conformant or non-packaging wastes.

This skip serves no purpose but to act as a source of unnecessary Landfill Tax for ICL. Under further investigation it was determined that the skip is used by Exel Logistics for foam inserts. Having sampled the skip and determined its contents it is currently not being used for this purpose.

6.5.3. Recommendations

6.5.3.1. Card

As is the case with all other skips on the site, too much card is being disposed of in the SME skip. Card present in the Lorry Park skip is sourced from all sites on the Stevenage Campus and is used only if other skips are full. It is suggested that card arising from these sites be recycled on their respective sites. Providing a Severnside skip in this area would not be beneficial as card arisings in the SME skip are relatively small

6.5.3.2. Paper

Paper arisings are sourced from other sites on the campus. Paper should be recycled on their respective sites only.

6.5.3.3. Plastics

Plastic arisings are relatively unimportant in this skip. Plastic should be prevented from reaching this skip and instead be recycled on the respective sites.

6.5.3.4. Other Issues

It is suggested that the SME skip placement in the lorry park be removed and placed elsewhere, such as STE 10 or STE 14, or be better monitored by security and RCO staff. This will ensure ICL are not charged unnecessary Landfill Tax as a result of heavy non-conformant wastes being present.

6.6. SUMMARY FINDINGS

Sampled backdoor arisings amounted to approximately 1.1 tonnes. This equates to 58 tonnes of backdoor arisals annually. However, it is doubtful that all these arisings could be recovered for recycling. This is due to the relatively small quantities in which some of the material types exist and the manner in which the materials are contaminated. Opportunities for recycling appear to exist for polyethylene, paper and card.

However card and paper are already being recycled to some extent on Campus. If current card and paper arisings are to be utilised for recycling a large increase in separation efficiency must be accomplished. This must also be attained in the case of plastics recycling.

To increase the efficiency of recycling on Campus a number of actions could be taken:

- 1) **Increased Number of Skips.** An increased number of skips should be provided; one for each material type, depending on how many are to be recycled. Smaller skips than currently provided would be required. Extra skips could be placed centrally on site, adjacent to the Lorry Park, where a large amount of open space is available. The areas should be fenced to prevent litter.
- 2) **Separation Bonus Scheme.** This scheme provides a basic bonus available for 100% separation, which reduces as separation efficiency lowers. Figures relating to efficiency of segregation would have to be provided by the appropriate recycling company and checked internally by ICL. Although this scheme requires capital outlay, cost benefits quickly repay this and will provide a financial incentive.
- 3) **Monitoring of Skips.** Skips on the Campus should be monitored to ensure non-conformant wastes do not appear in individual material type skips. This is essential to ensure that segregated wastes are not cross-contaminated, minimising the value of the material.
- 4) **Staff Awareness and Retraining.** Staff, particularly RCO employees, need to be informed of the changes that will take place on Campus so they can react to them in good time and effect an improvement in efficiency.

The Review Team also suggest that research be carried out into other waste recycling companies that offer a full range of services and greater financial reward.

7. SUMMARY

7.1. PRINCIPAL FINDINGS

In general, waste management operations on the Stevenage Campus are undertaken sufficiently well. Where there is specific legislation relating to waste management on the Campus, ICL are compliant in most respects. However, in the case of Duty of Care more could be done in the spirit of the legislation, such as implementing waste minimisation strategies and improving site housekeeping, rather than merely complying to the letter of the law

The Campus itself is untidy, particularly around some waste disposal compounds such as STE 04. The poor state of the site represents a source of liability for ICL. The lack of consideration given to all environmental issues was of concern. If the quality of waste management is to improve, an overall increase in environmental awareness will have to be attained.

Concerning the Packaging Review, very few key personnel were aware of the UK Packaging Regulations or the effect this legislation upon ICL. The lack of awareness towards the Regulations by RCO Support Staff was of particular concern. As their co-operation is vital if ICL are to meet their obligation, the Review Team feel it is necessary for WML and ICL to communicate more effectively with them and to inform staff of their present and future responsibilities.

7.2. PRINCIPAL RECOMMENDATIONS

On the basis of this Review ICL's Stevenage site needs to improve its waste management practices in a number of cases:

- ◆ full compliance with ICL's Duty of Care by correct completion of Waste Transfer Notes;
- ◆ compliance with the Special Waste Regulations by use of Consignment Notes where required;
- ◆ improvement of housekeeping on site;
- ◆ improved training and communication with RCO Support Services, to achieve the above points.

With regard to the compliance with the UK Packaging Regulations, by use of backdoor arisings, a number of main recommendations should be considered:

- ◆ the supply of extra skips for the successful segregation of each material type, including the provision of lockable white paper mini-skips for each site;
- ◆ training of staff regarding the correct segregation of material types, with the implementation of some form of efficiency incentive;
- ◆ research into other waste recycling companies offering services required by ICL.

A follow up audit should be carried out soon after the implementation of the UK Packaging Regulations, to assess whether the Stevenage Campus is effectively recycling backdoor arisings, and to determine any improvements in waste management practices.

APPENDIX A

MAPS & FIGURES

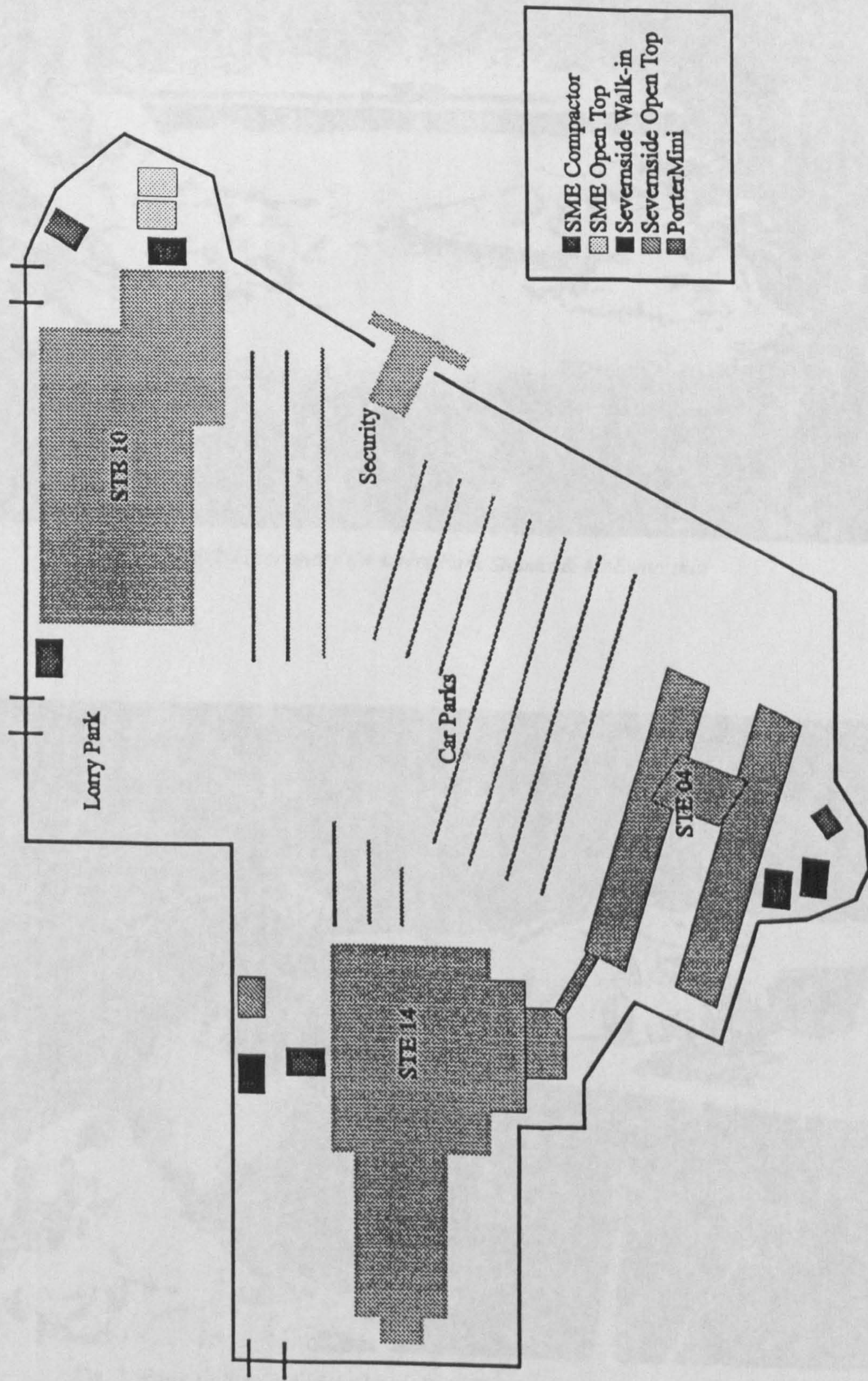


Fig. 1 Map of the Stevenage Campus

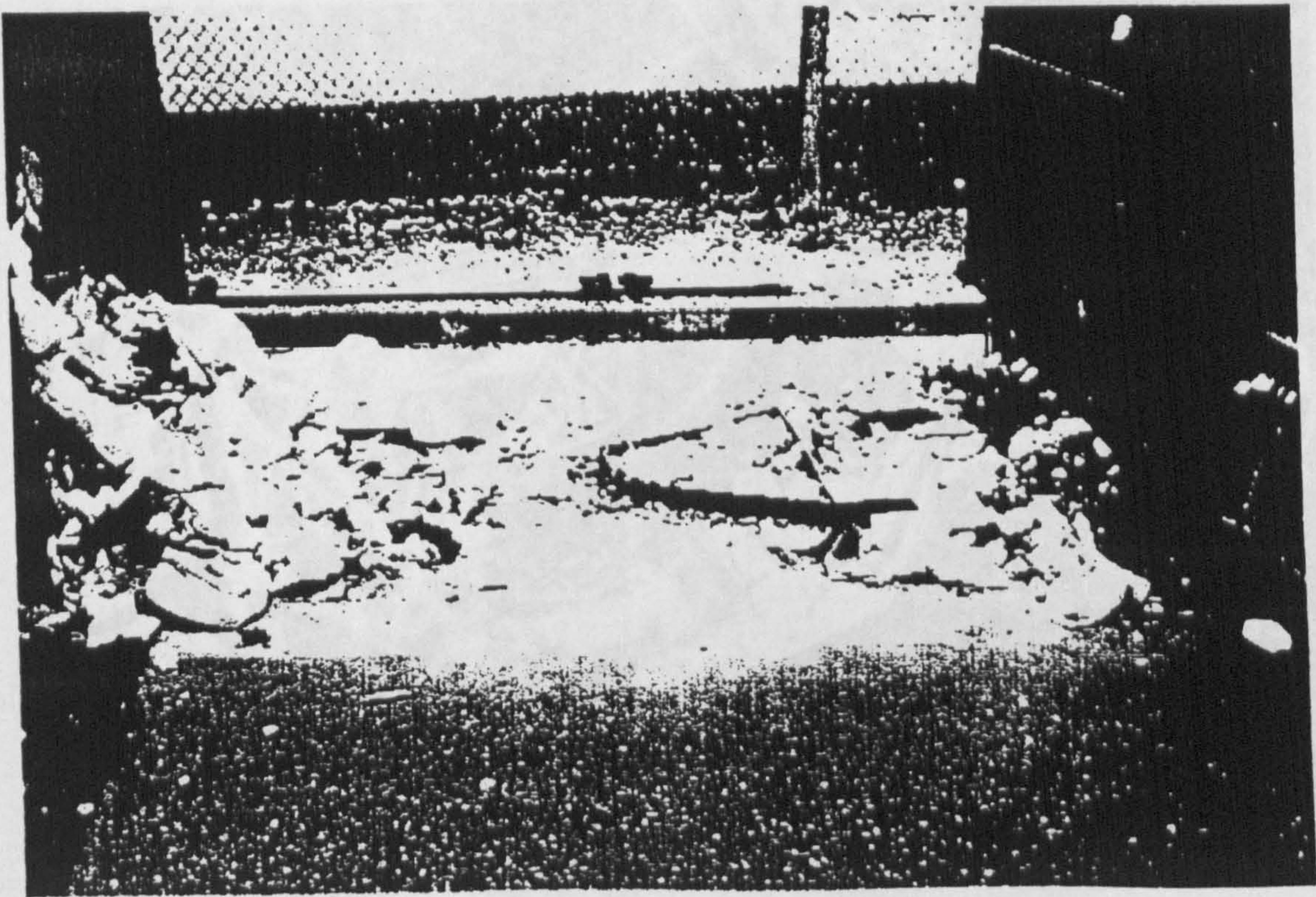


Fig. 2 Litter under the Lorry Park Shanks & McEwan skip

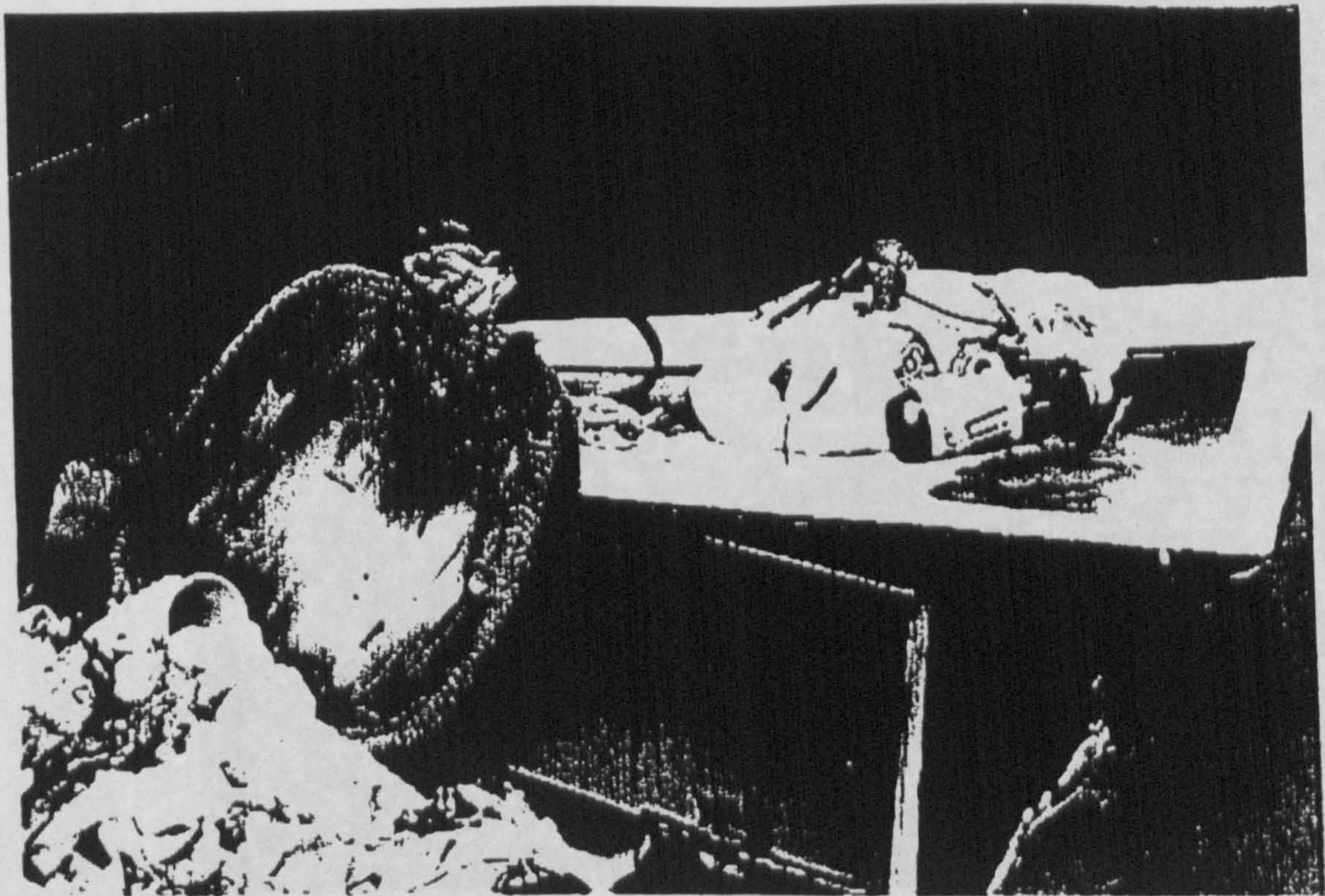


Fig. 3 Waste spilling out of the Lorry Park Shanks & McEwan skip compactor

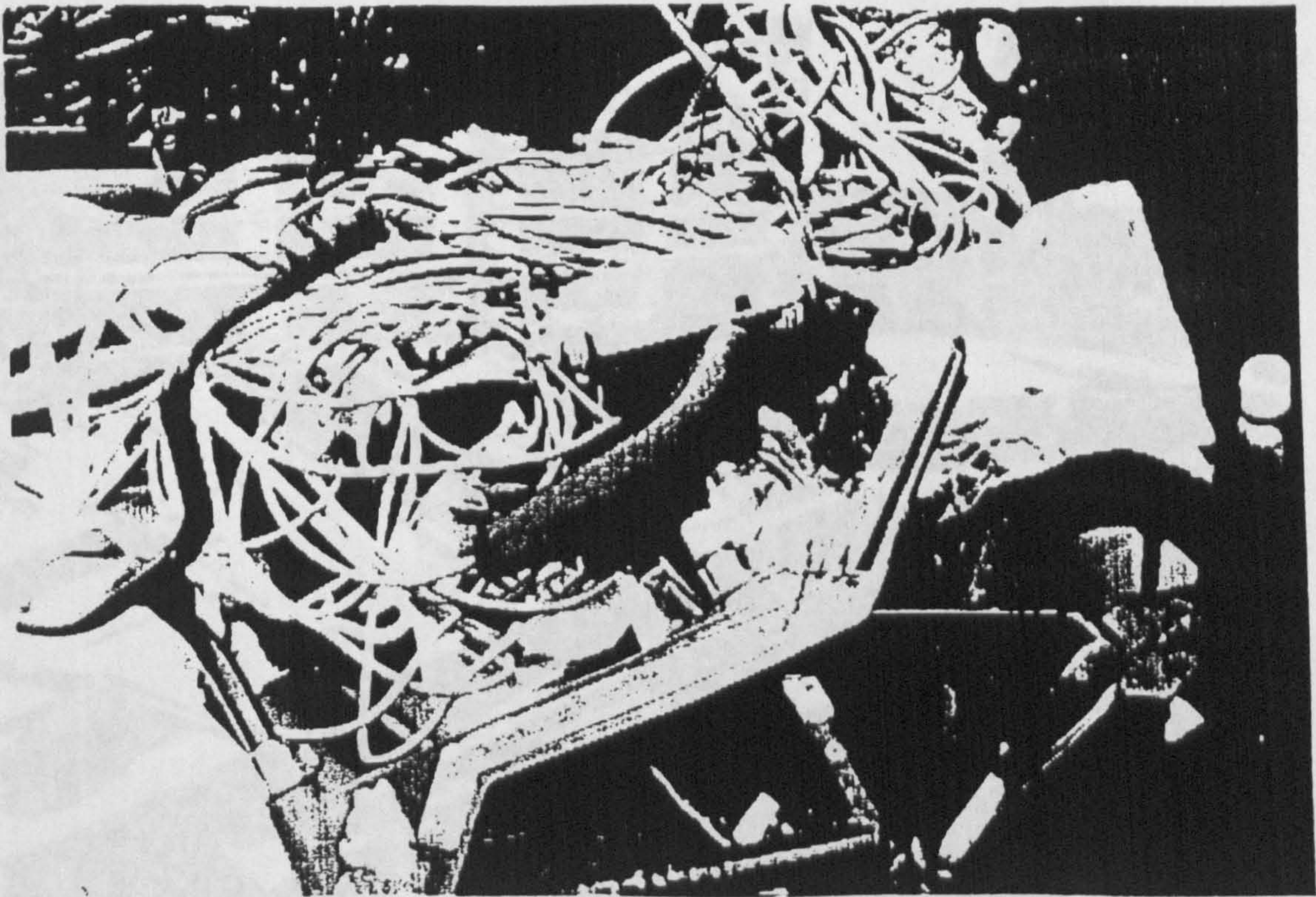


Fig. 4 Non-ICL waste from the Lorry Park Shanks & McEwan skip

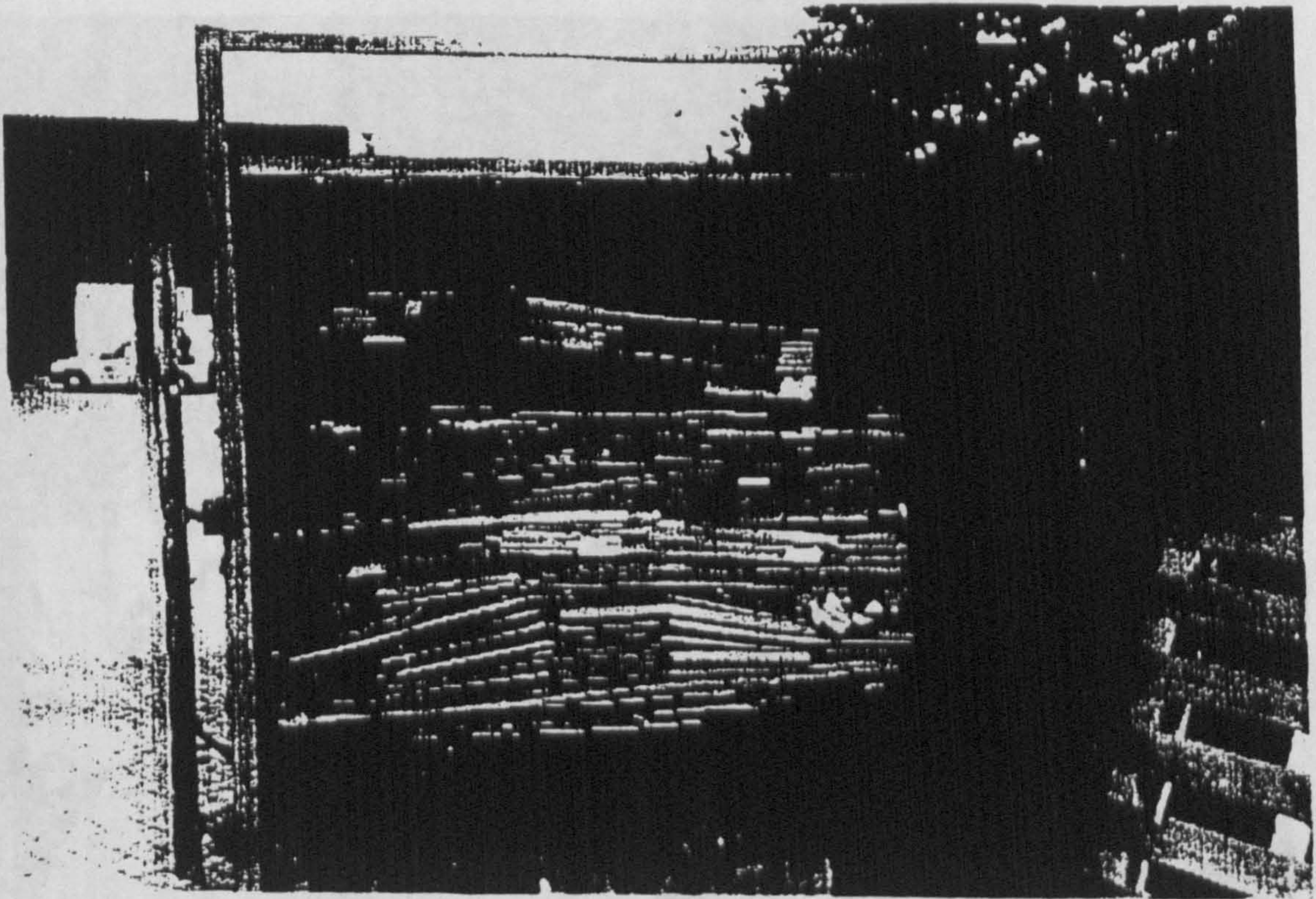


Fig. 5 Severnside card skip with well-stacked card inside

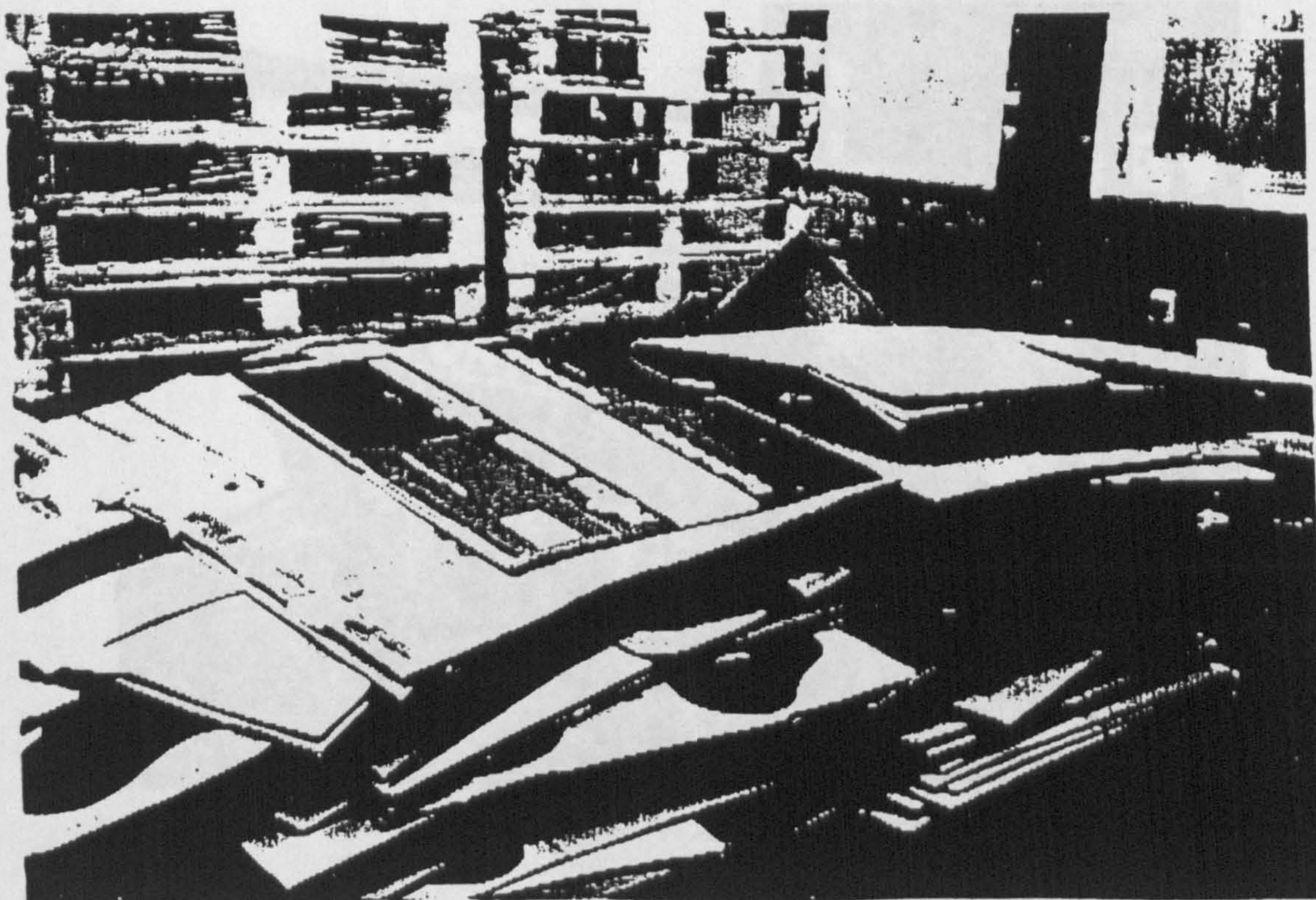


Fig. 6 Card poorly stacked and exposed to the weather outside the Severnside card skip in STE 10

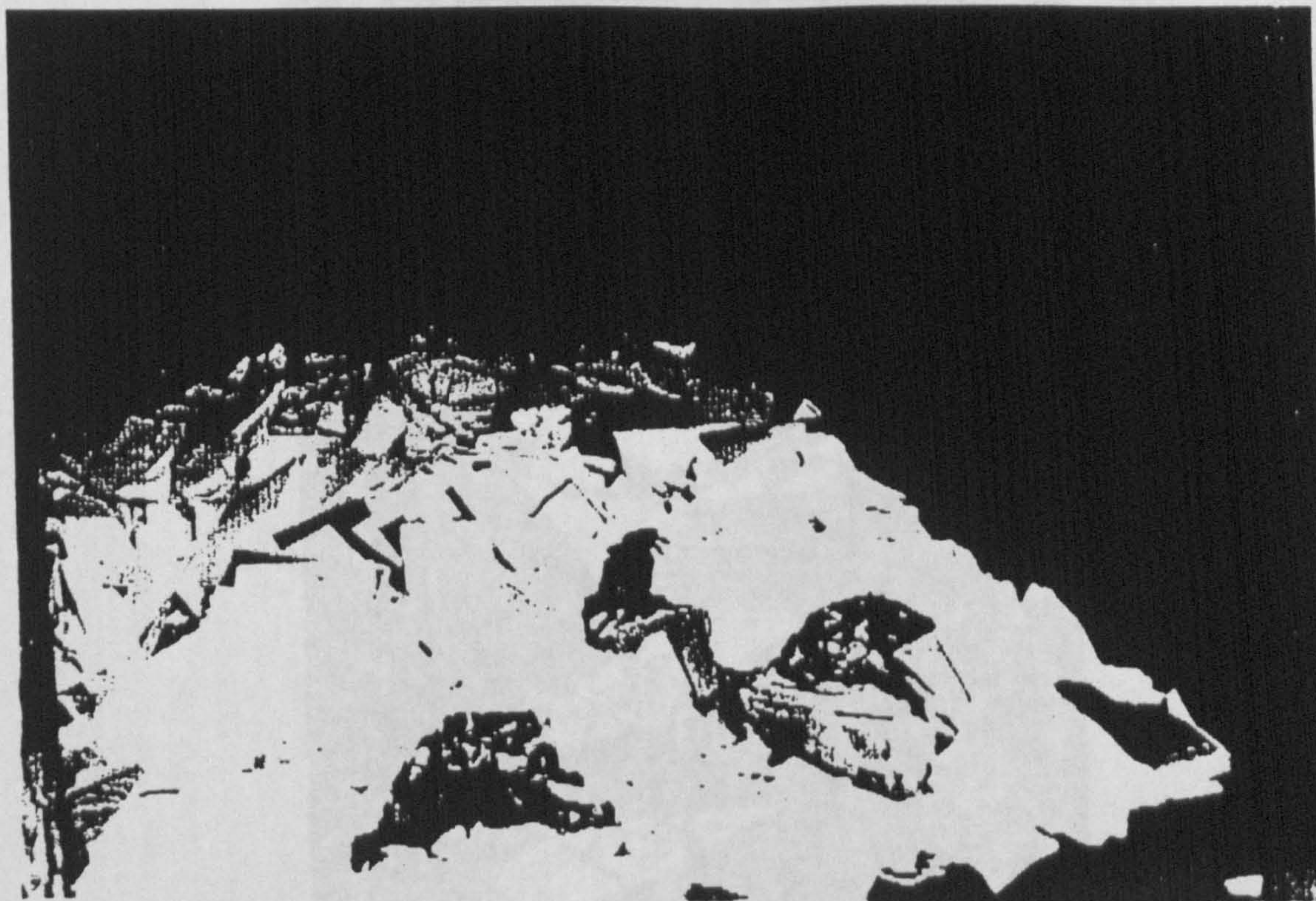


Fig. 7 Open-door Severnside paper skip at STE 04 containing poorly stacked paper and other materials



Fig. 8 Porters skip for spent fluorescent tubes

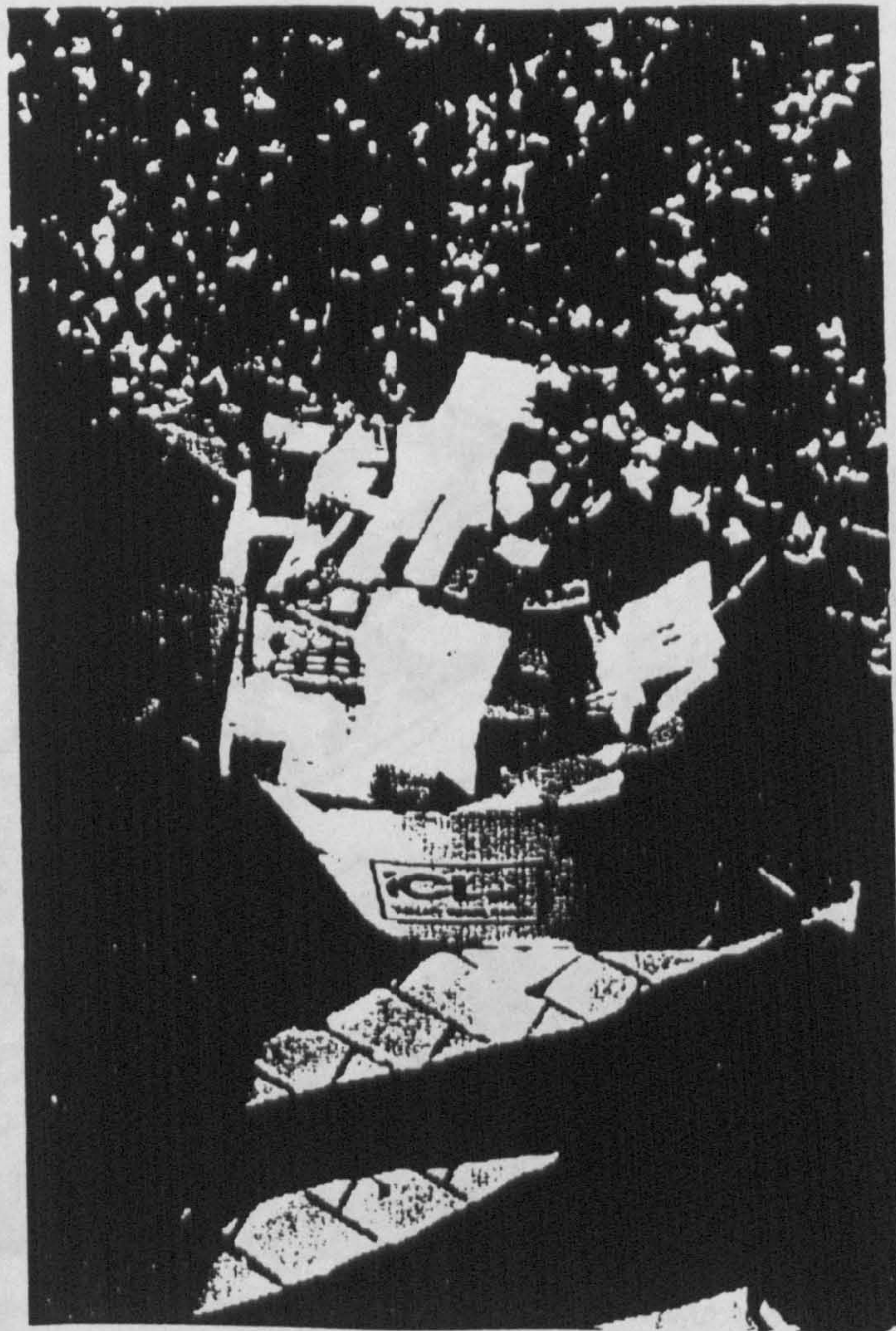


Fig. 9 Scrap electronic equipment stored outside at STE 10, without any protection from the weather

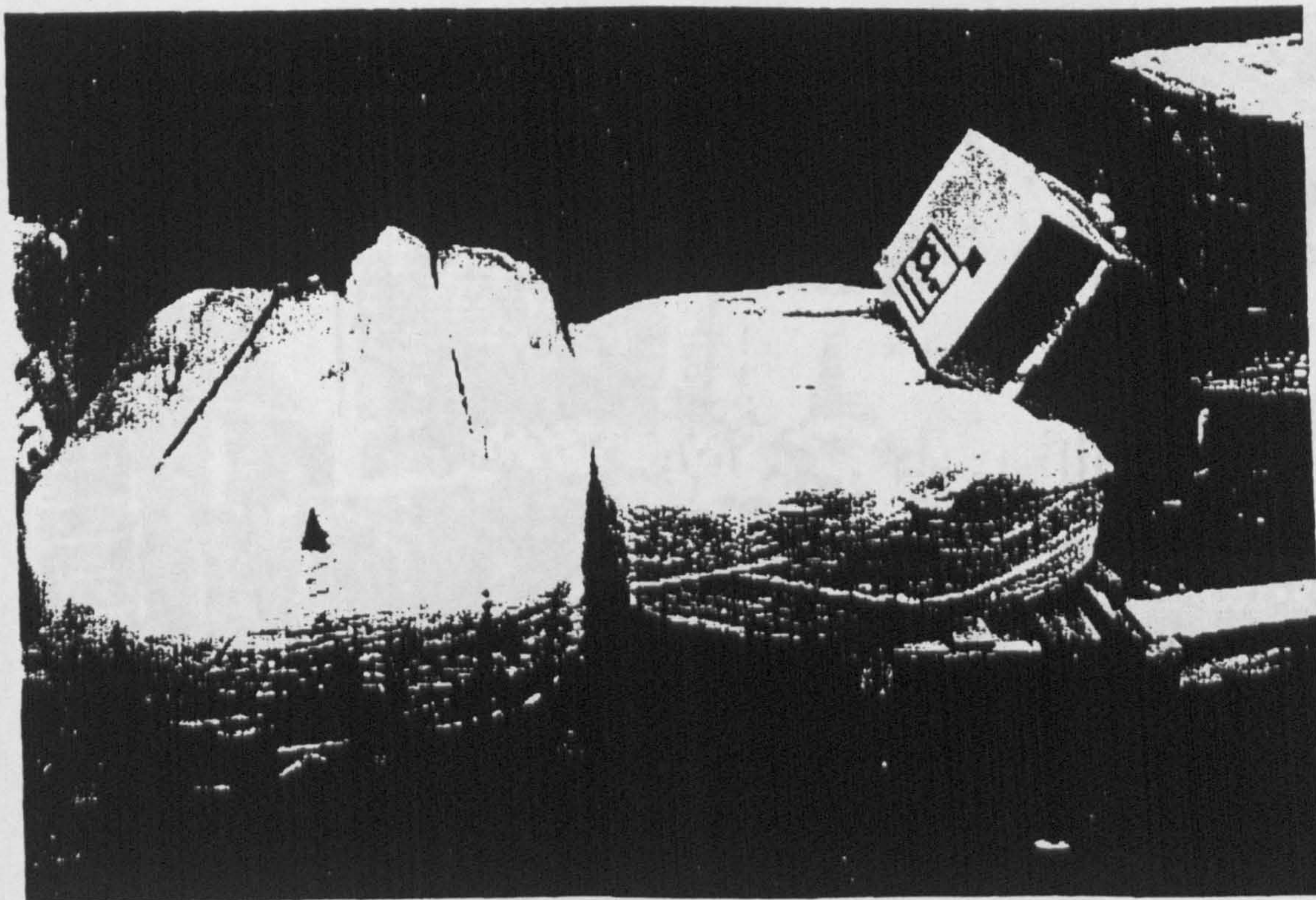


Fig. 10 Scrap electronic equipment stored outside STE 10, wrapped up to provide some protection from the weather

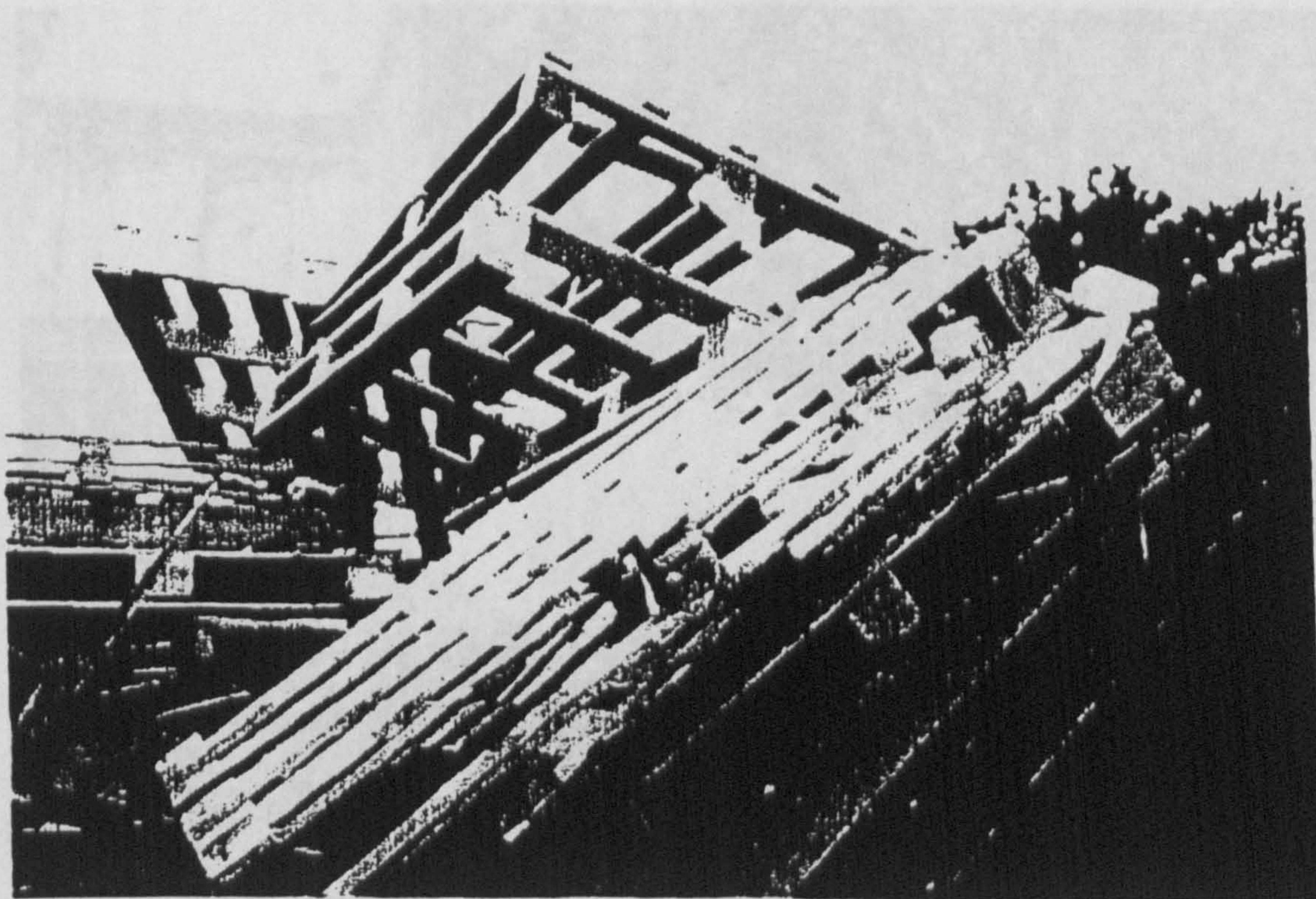


Fig. 11 Wooden pallets poorly stacked in a Shanks & McEwan skip at STE 10 awaiting disposal



Fig. 12 Multi-purpose use area at the back of STE 10



Fig. 13 Leachate from the anodised coating on scrap electrical equipment stored in the Lorry Park

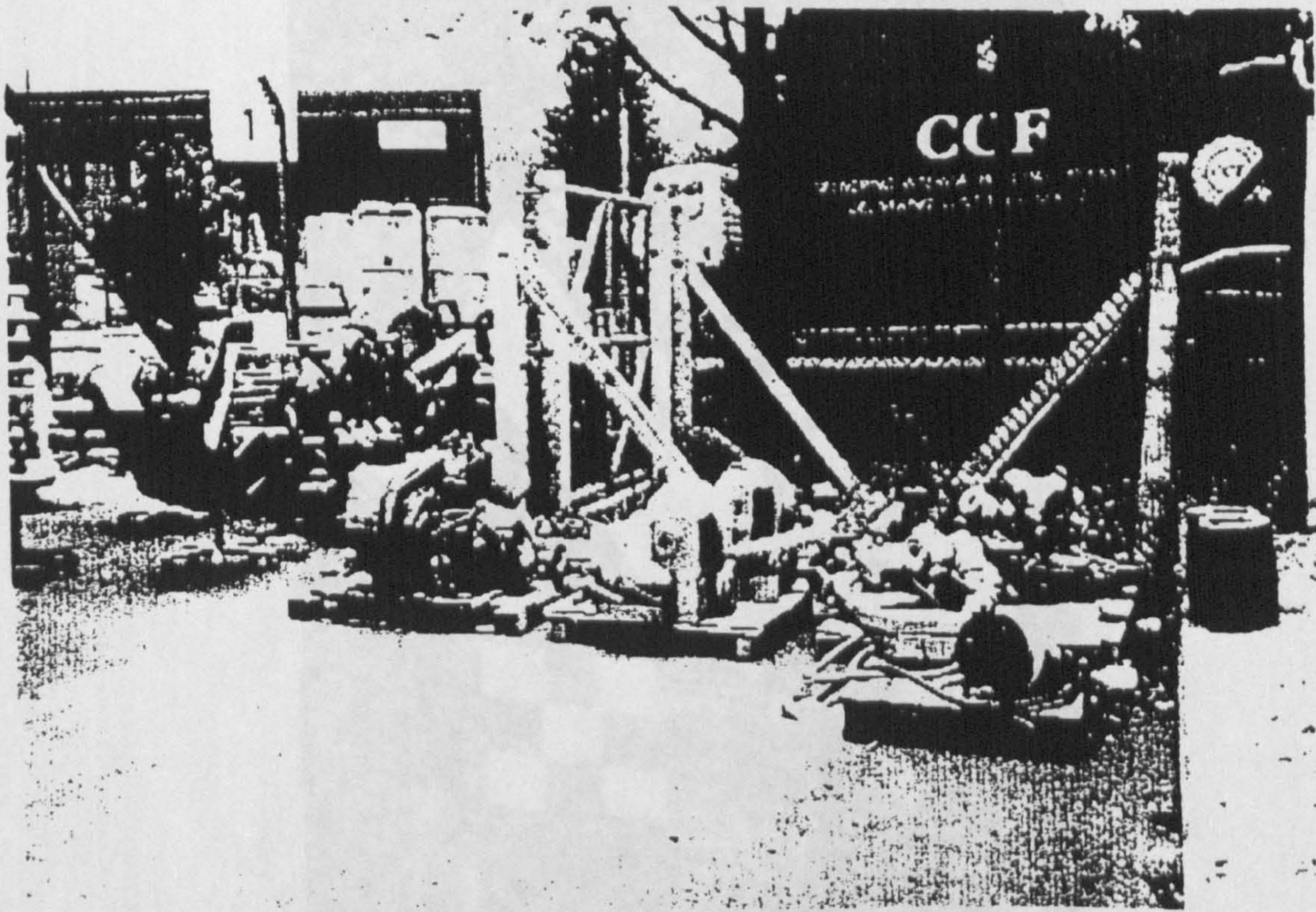


Fig. 14 Scrap electrical equipment being stored next to the Shanks & McEwan skip in the Lorry Park



Fig. 15 The Shanks & McEwan skip in the Lorry Park is poorly monitored and contains large quantities of non-ICL waste

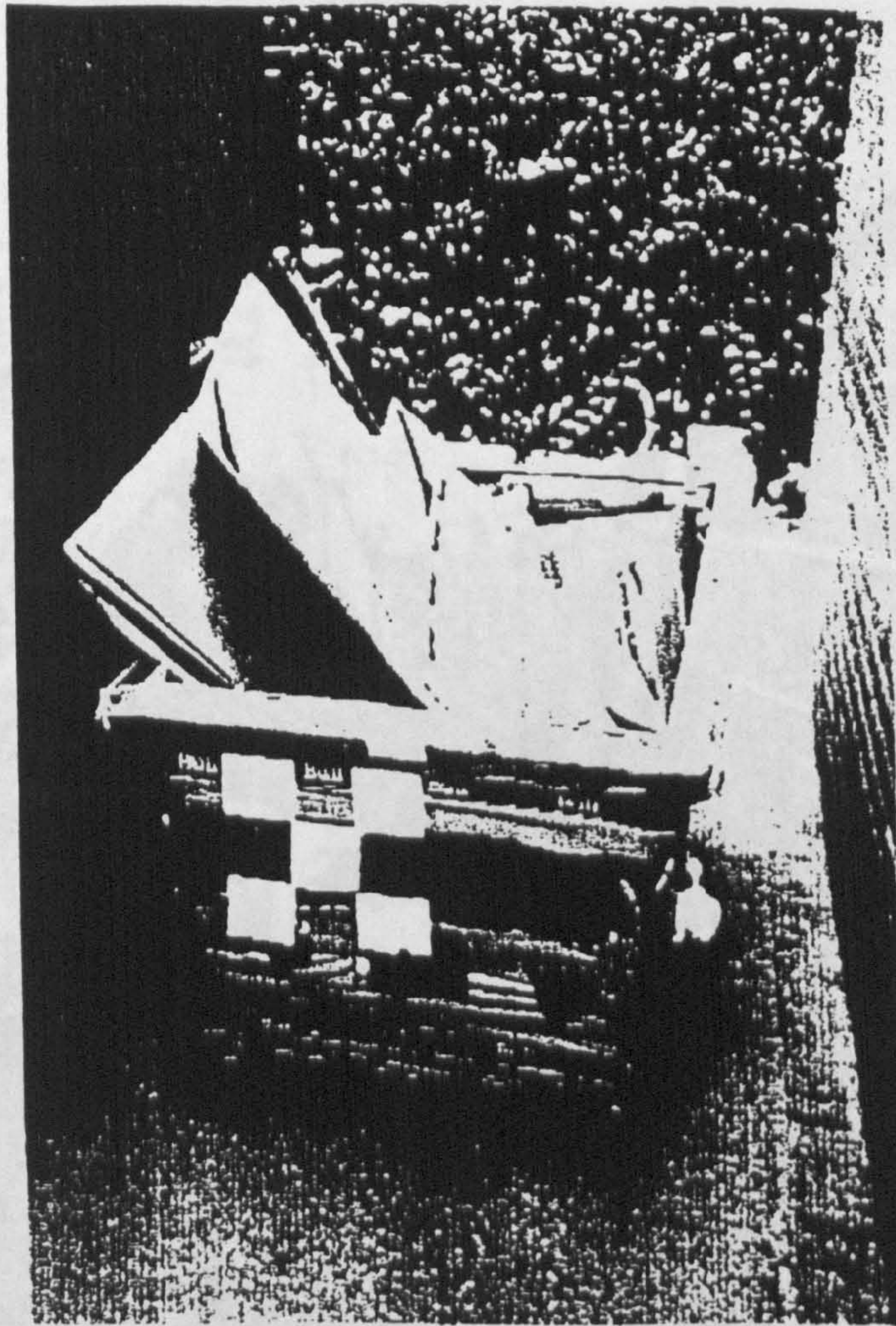


Fig. 16 *Card being disposed of into the Shanks & McEwan skip for disposal to landfill*

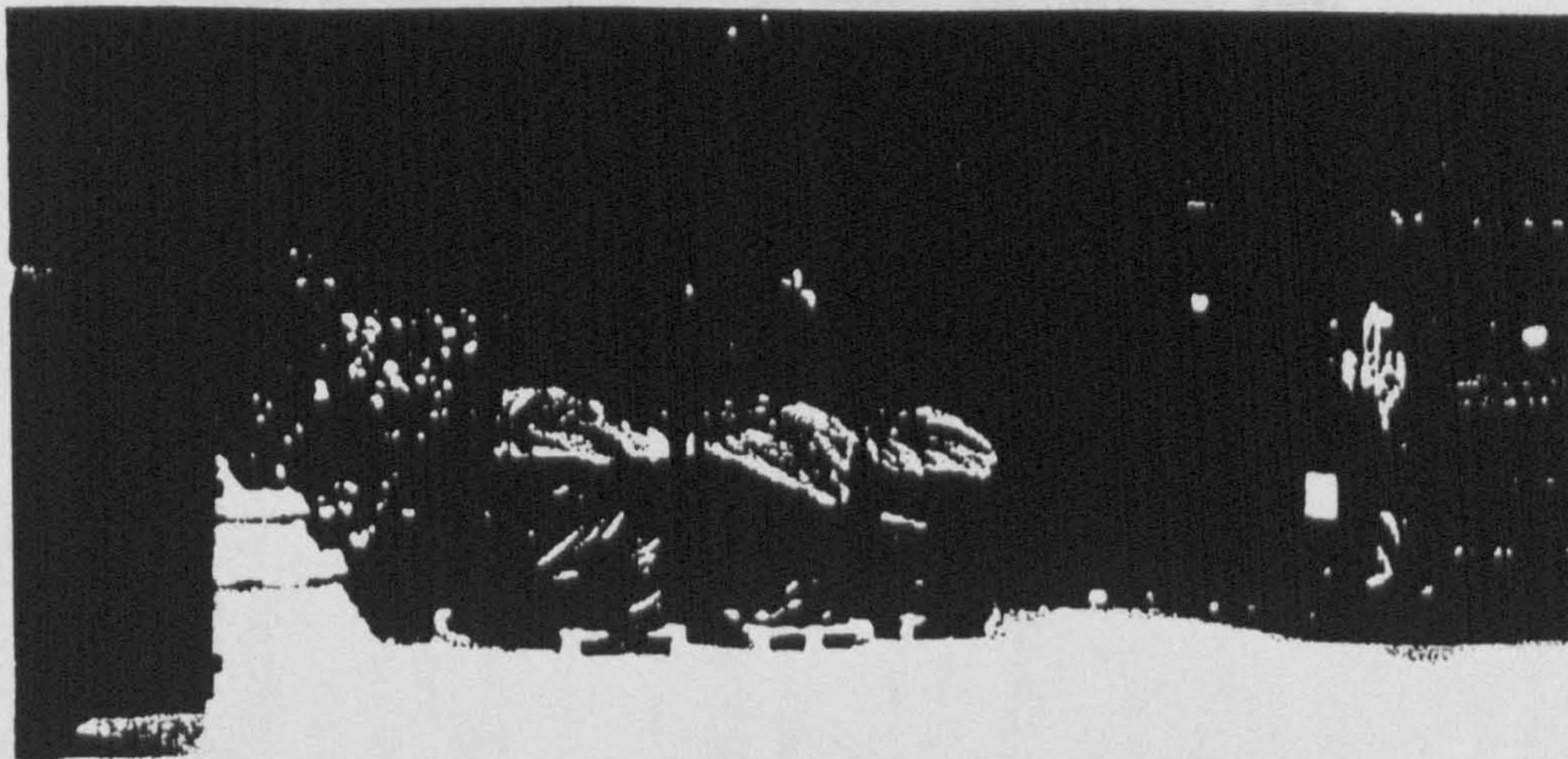


Fig. 17 *Granulated card from STE 14 bagged for recycling*

APPENDIX B

WASTE MANAGEMENT DOCUMENTATION

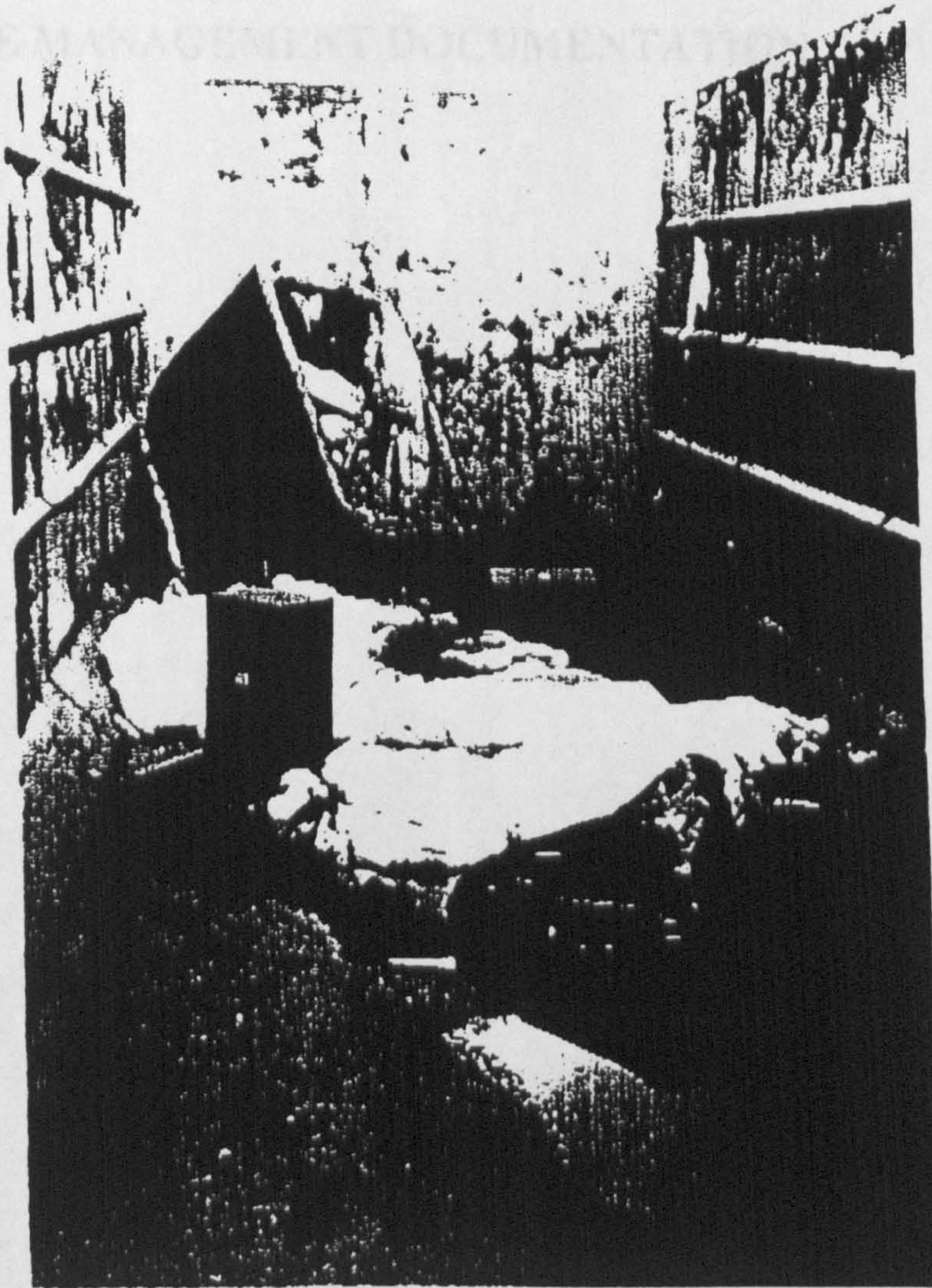


Fig. 18 Domestic waste being disposed of in the open-topped Severnside skip for granulated and bagged card

APPENDIX B

WASTE MANAGEMENT DOCUMENTATION



Woburn Sands, Bucks. MK17 8TA
 Tel: (01908) 282727 Fax: (01908) 282728
 VAT Reg. No. 259 5477 13

TRANSFER/ADVICE NOTE/SALES INVOICE
 (For Cash Sales this is a V.A.T. Invoice)

WASTE COLLECTION SERVICES

CUSTOMER: INITIAL CONTRACT SERVICES LTD DATE/TAX POINT: 01-MAY-97 TICKET No: 2755/HITC

A/C No: B1231 CARRIERS No: BDF/047457
 LOCATION: SITE 14 CAVENDISH RD DISTRICT: SME HITCHIN 01462 731991
 STEVENAGE SME ORDER No: 13391/WOBU
 HERTS

DISPOSAL POINT: SME ARLESEY
 VEHICLE REG: H601CNR
 DRIVER NAME: ~~R. HARRIS~~ Ron MATTHEWS

BOOKED BY: Scheduled
 CUSTOMER REF:
 DUTY OF CARE: B/006194
 PERMIT NO:
 SERVICE: EXCHANGE 1 RR 26.8 CU.M PK
 INDUSTRIAL/COMMERCIAL WASTE

General Terms & Conditions

- 1 The Customer warrants that all the requirements of the Environmental Protection Act 1990 and subsequent Regulations are complied with
- 2 Hazardous wastes are not permitted unless previously agreed with the company
- 3 The Customer is responsible for organising cones and lights for skips left in the highway unless otherwise stipulated by the company
- 4 Where the vehicle has to leave the public highway at the Customer's request any damage to pavements, pathways, etc shall be the responsibility of the Customer

DRIVERS SIGNATURE: _____
 PRODUCERS SIGNATURE: *[Signature]*
 PRINT NAME: _____ TIME: _____

FOR MORE DETAILED TERMS & CONDITIONS SEE OVER



Shanks & McEwan (Southern Waste Services) Limited
 Woodside House, Church Road,
 Woburn Sands, Milton Keynes,
 Bucks. MK17 8TA
 Tel: (01908) 282727 Fax: (01908) 282728
 VAT Reg. No. 259 5477 13

TRANSFER/ADVICE NOTE/SALES INVOICE
 (For Cash Sales this is a V.A.T. Invoice)

WASTE COLLECTION SERVICES

CUSTOMER: R C O SUPPORT SERVICES LTD DATE/TAX POINT: 25-JUN-97 TICKET No: 9401/HITC

A/C No: BR659
 LOCATION: SITE 10
 CAVENDISH RD
 STEVENAGE
 HERTS
 SG1 2DY

CARRIERS No: BDF/047457
 DISTRICT: SME HITCHIN 01462 731991
 SME ORDER No: 1211/HITC

DISPOSAL POINT: SME HITCHIN TRANSFER STATION
 VEHICLE REG: H60JLNH
 DRIVER NAME: R. HARRIS

BOOKED BY: Scheduled
 CUSTOMER REF:
 DUTY OF CARE: B/008084
 PERMIT NO:

SERVICE: EXCHANGE 1 RR 26.8 CU.M PK
 INDUSTRIAL/COMMERCIAL WASTE

General Terms & Conditions

1. The Customer warrants that all the requirements of the Environmental Protection Act 1990 and subsequent Regulations are complied with.
2. Hazardous wastes are not permitted unless previously agreed with the company.
3. The Customer is responsible for organising cones and lights for skips left in the highway unless otherwise stipulated by the company.
4. Where the vehicle has to leave the public highway at the Customer's request any damage to pavements, pathways, etc. shall be the responsibility of the Customer.

FOR MORE DETAILED TERMS & CONDITIONS SEE OVER

DRIVERS SIGNATURE: _____

PRODUCERS SIGNATURE: A. Williams

PRINT NAME: _____

TIME: _____

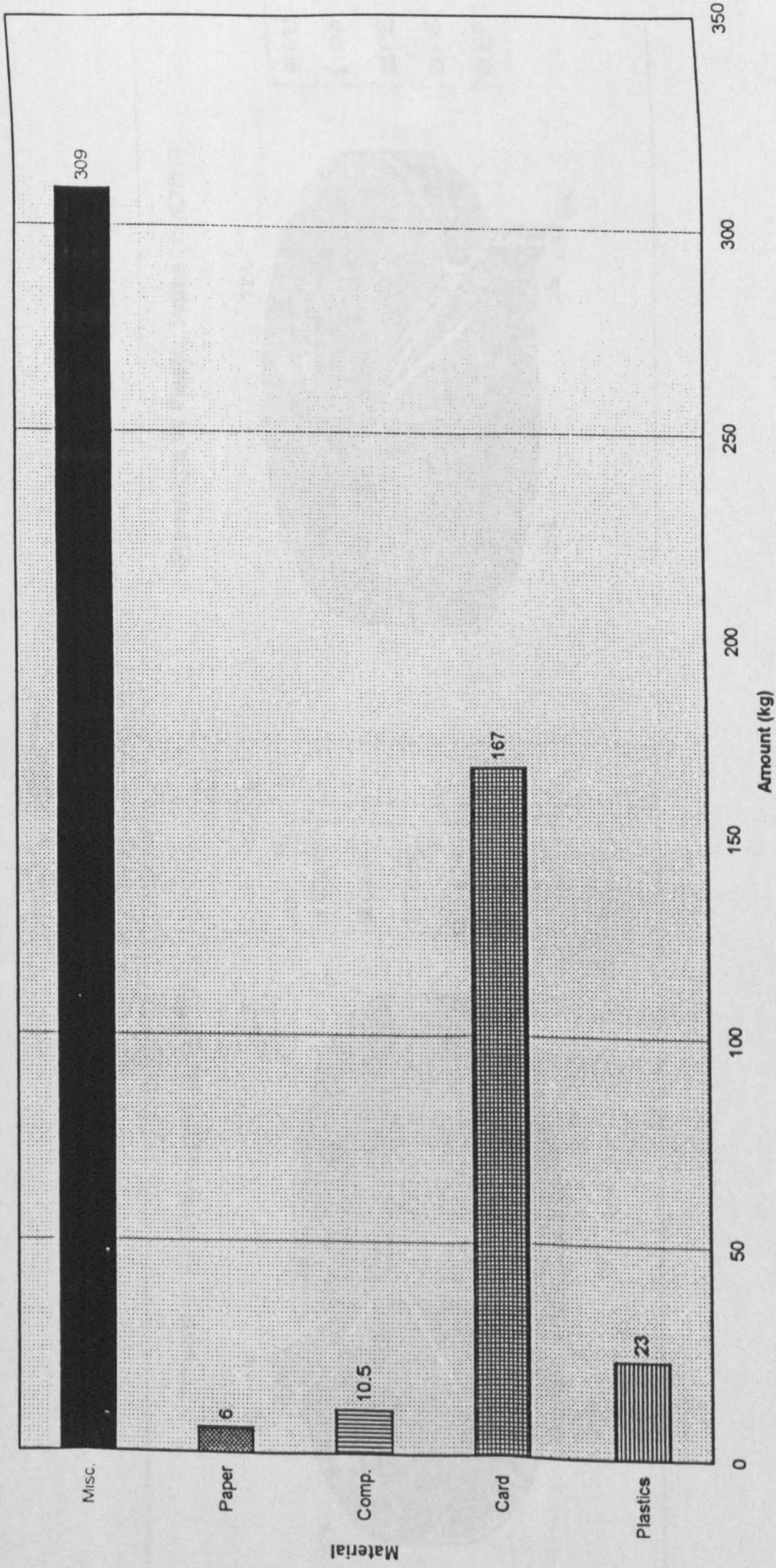
APPENDIX C

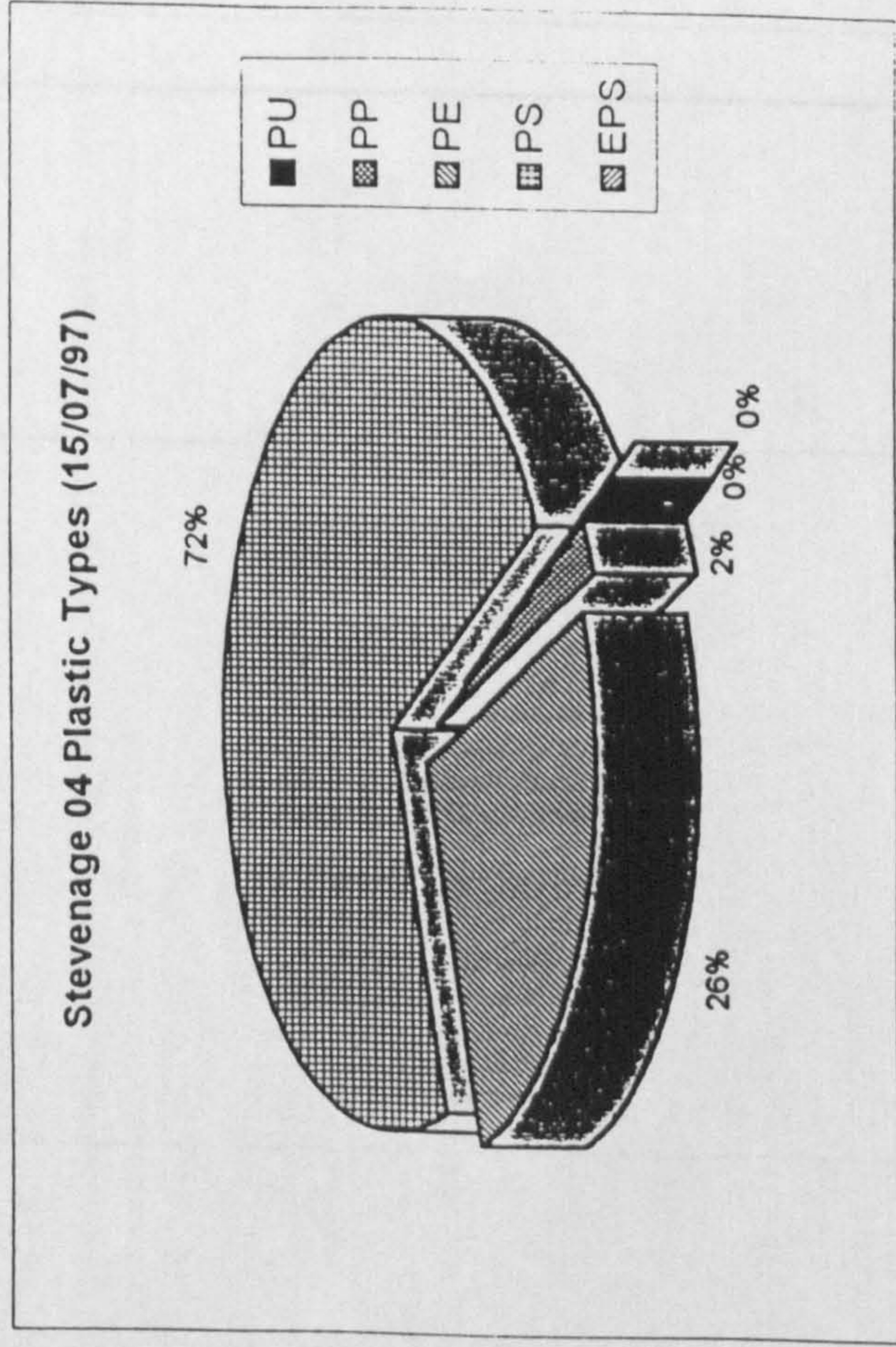
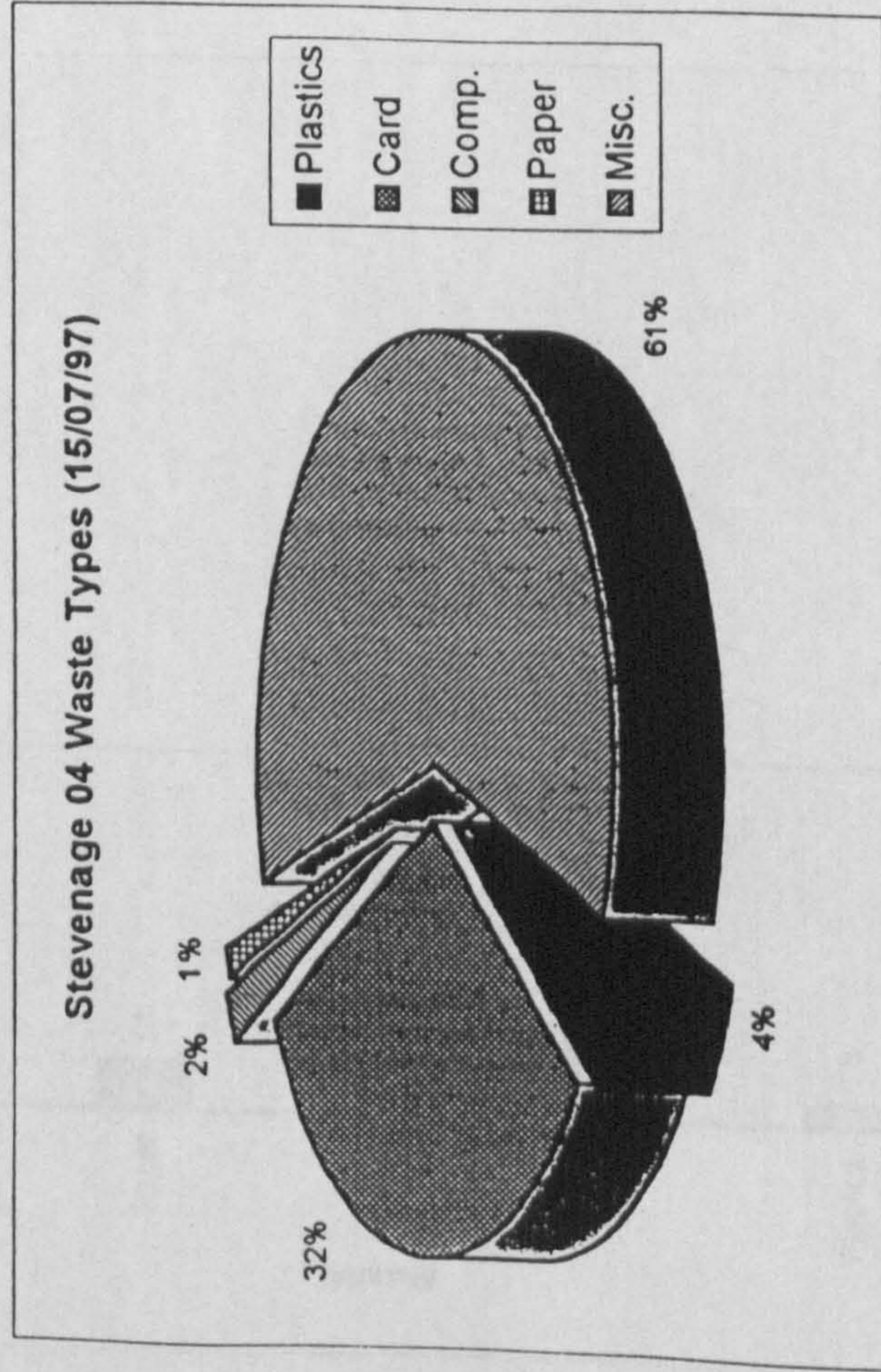
SAMPLING DATA

Waste Sampling

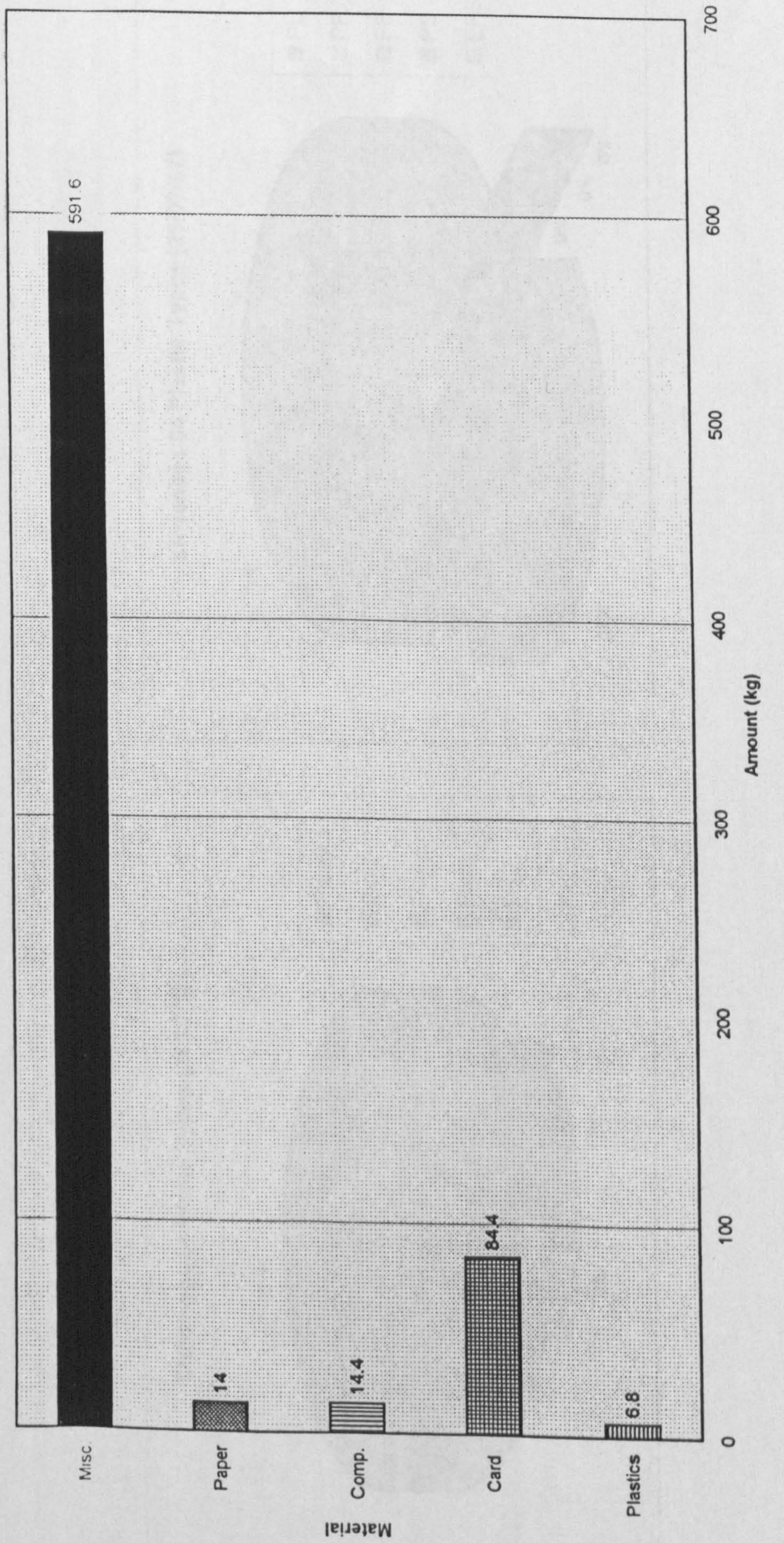
Date of Sampling	Location	Weight (kg)														BACKDOOR ARISINGS	TOTAL	
		PU	PP	PE	PS	EPS	Plastics	Card	Comp.	Paper	Misc.							
03/07/97	STE 10	7.2	4	40	4.4	0.6	55.6	218.4	8	91.2	6						373.2	379.2
10/07/97	STE 10	3.2	8	50.4	6	1	67.6	226	10	114.8	1.6						418.4	420
31/07/97	STE 10	16.8	13	76.5	5	0.4	111.7	147.2	39	65	52						362.9	414.9
11/07/97	Lorry Park	17.6	2	34	24.8	0.5	78.9	522.8	24	75.6	748.8						701.3	1450.1
16/07/97	STE 14	29	7.5	67	37.5	8.5	149.5	156	46.5	113.5	9						465.5	474.5
30/07/97	STE 14	28	10	70	30	8	146	256	18	64	22.6						484	506.6
06/08/97	STE 14	15	10	50	35	15	125	132.5	7.5	100	18						365	383
15/07/97	STE 04	0	0.5	6	16.5	0	23	167	10.5	6	309						206.5	515.5
29/07/97	STE 04	0	0	2	4.8	0	6.8	84.4	14.4	14	591.6						119.6	711.2
07/08/97	STE 04	0	0	4	8	0	12	140	5	8	456						165	621
05/08/97	STE 09	0	0	0	0	0	0	12	0	0	51.2						12	63.2
	TOTAL	112	42	331	178	32	695.1	2261	125.9	599.9	2214						2980.8	5895.4

Stevenage 04 Waste Types (15/07/97)

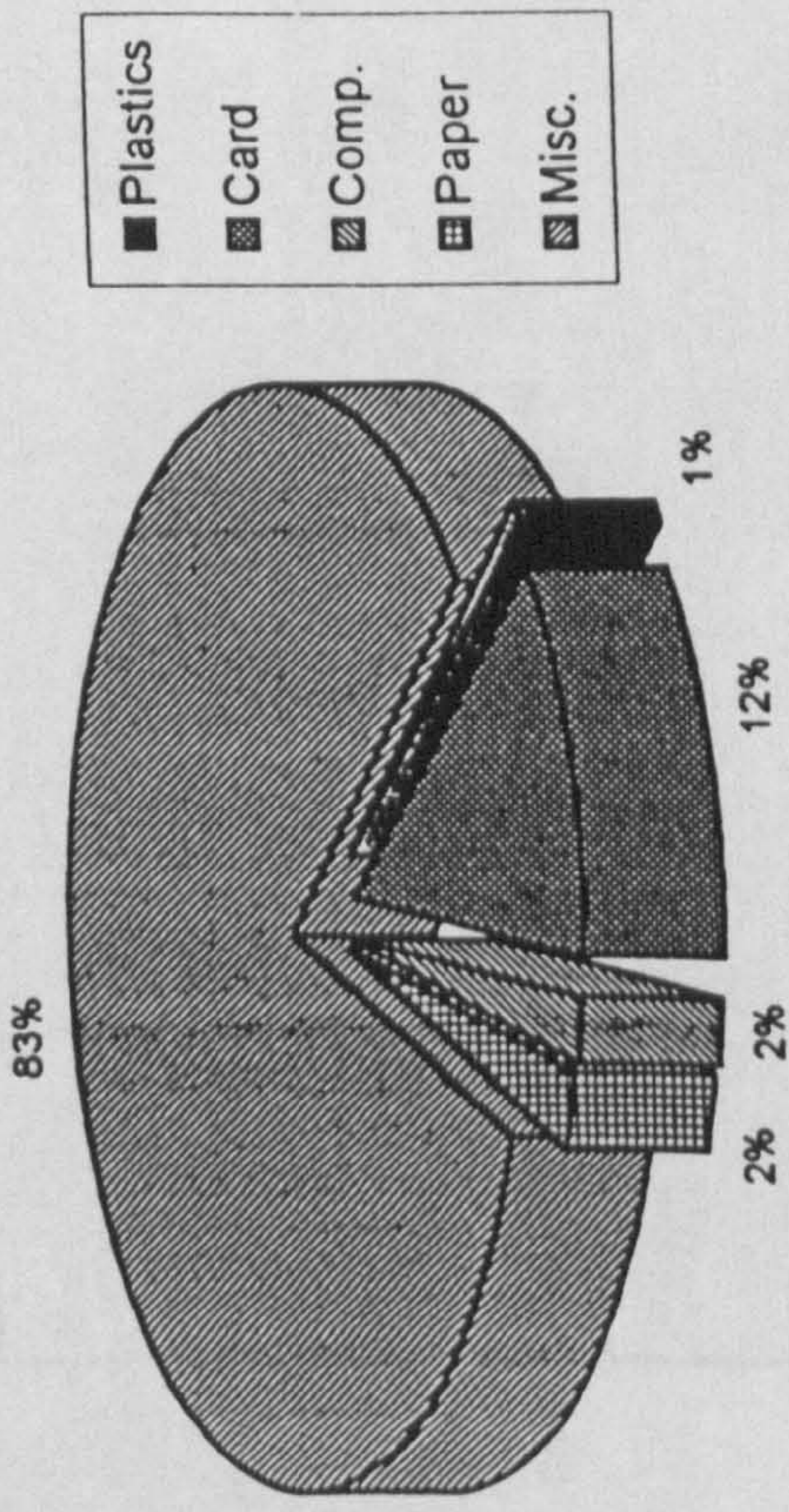




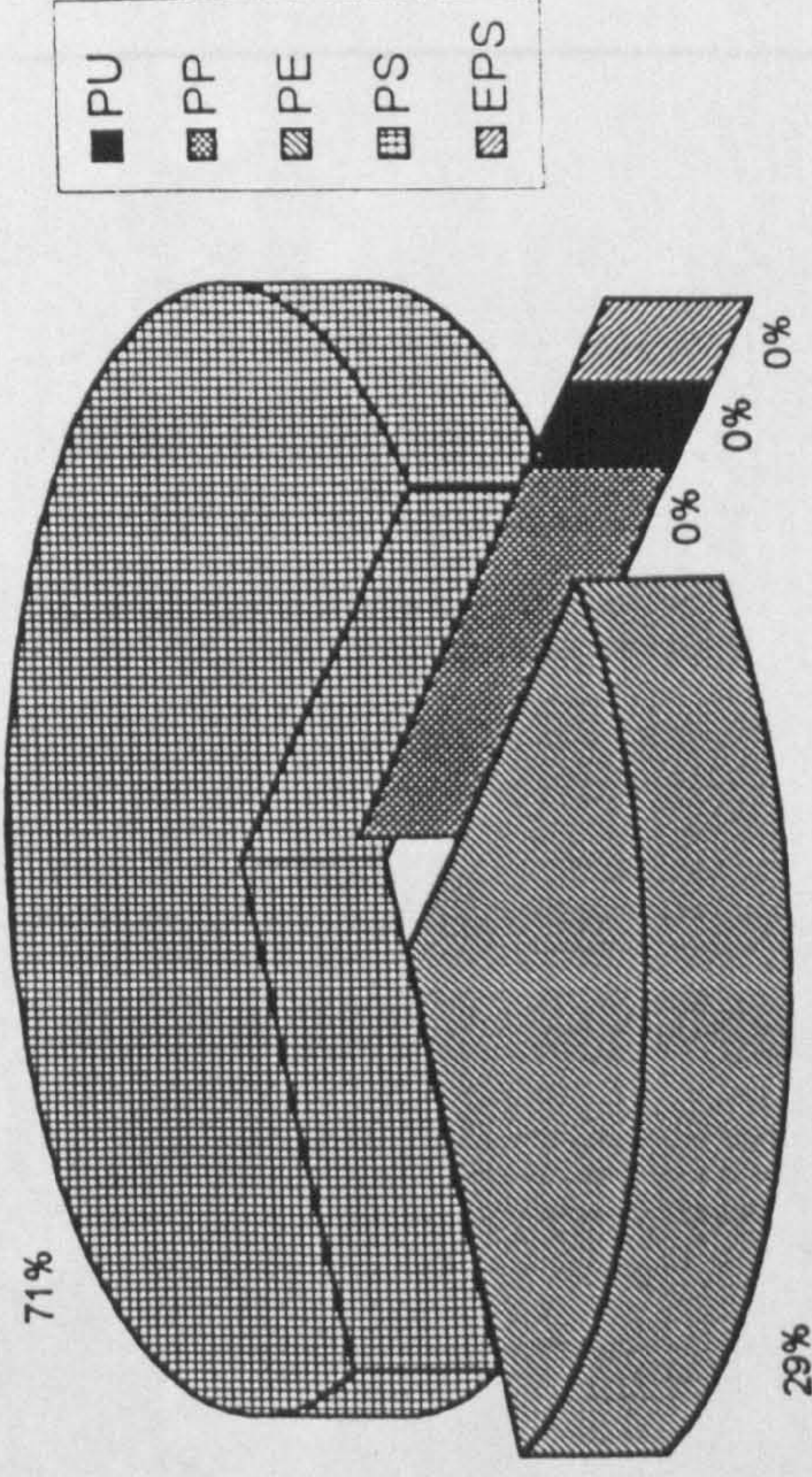
Stevenage 04 Waste Types (29/07/97)



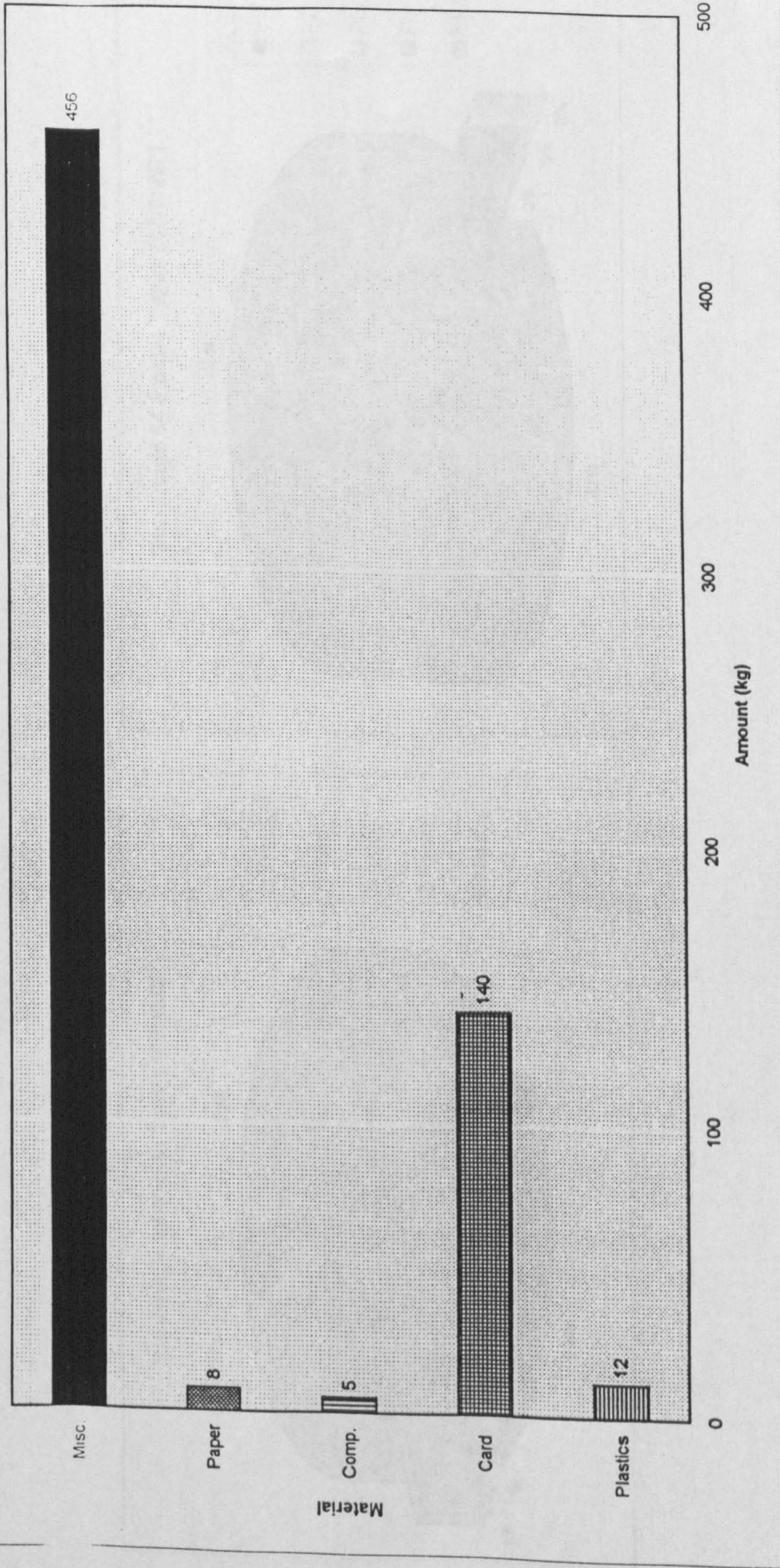
Stevenage 04 Waste Types (29/07/97)



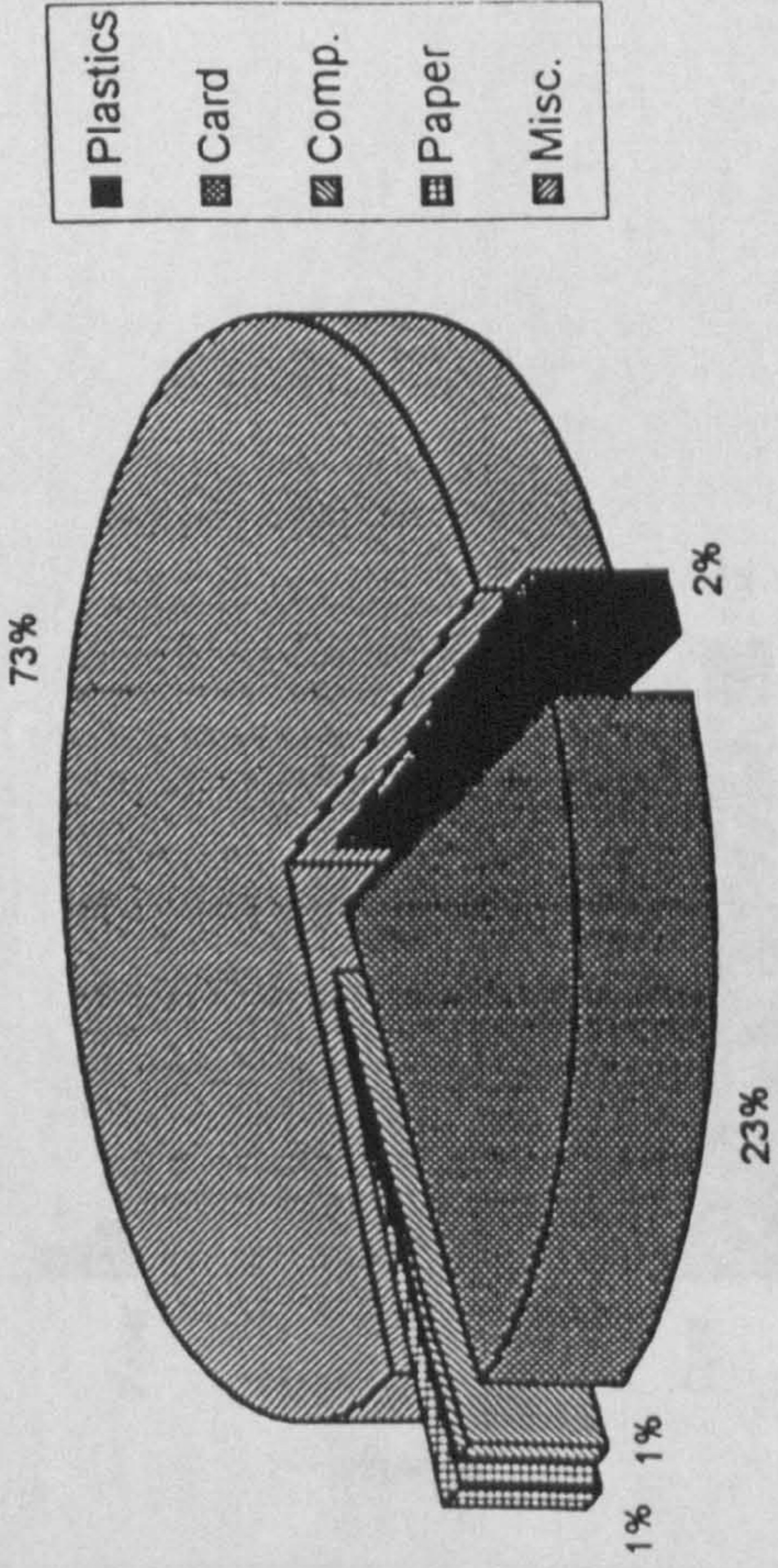
Stevenage 04 Plastic Types (29/07/97)



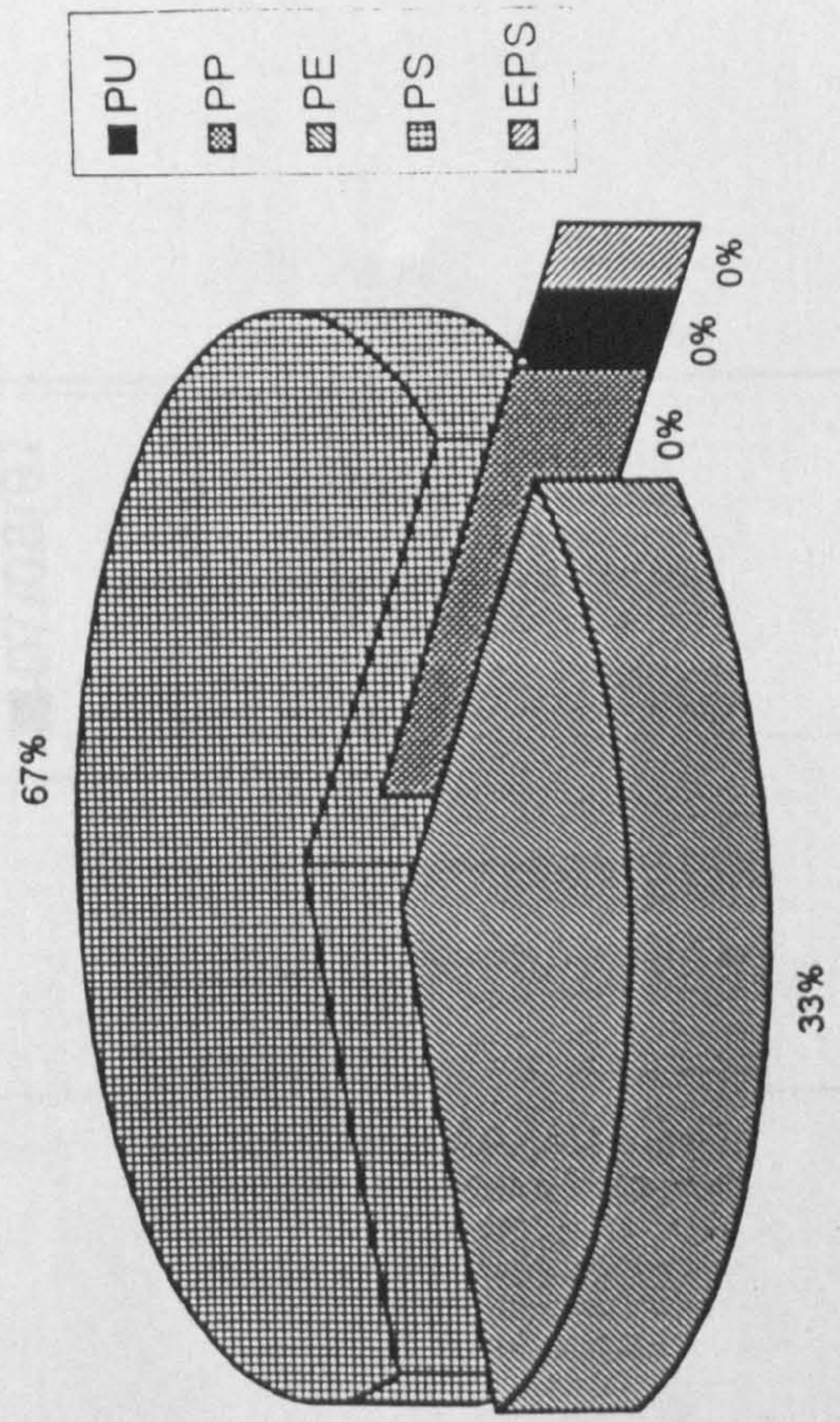
Stevenage 04 Waste Types (07/08/97)

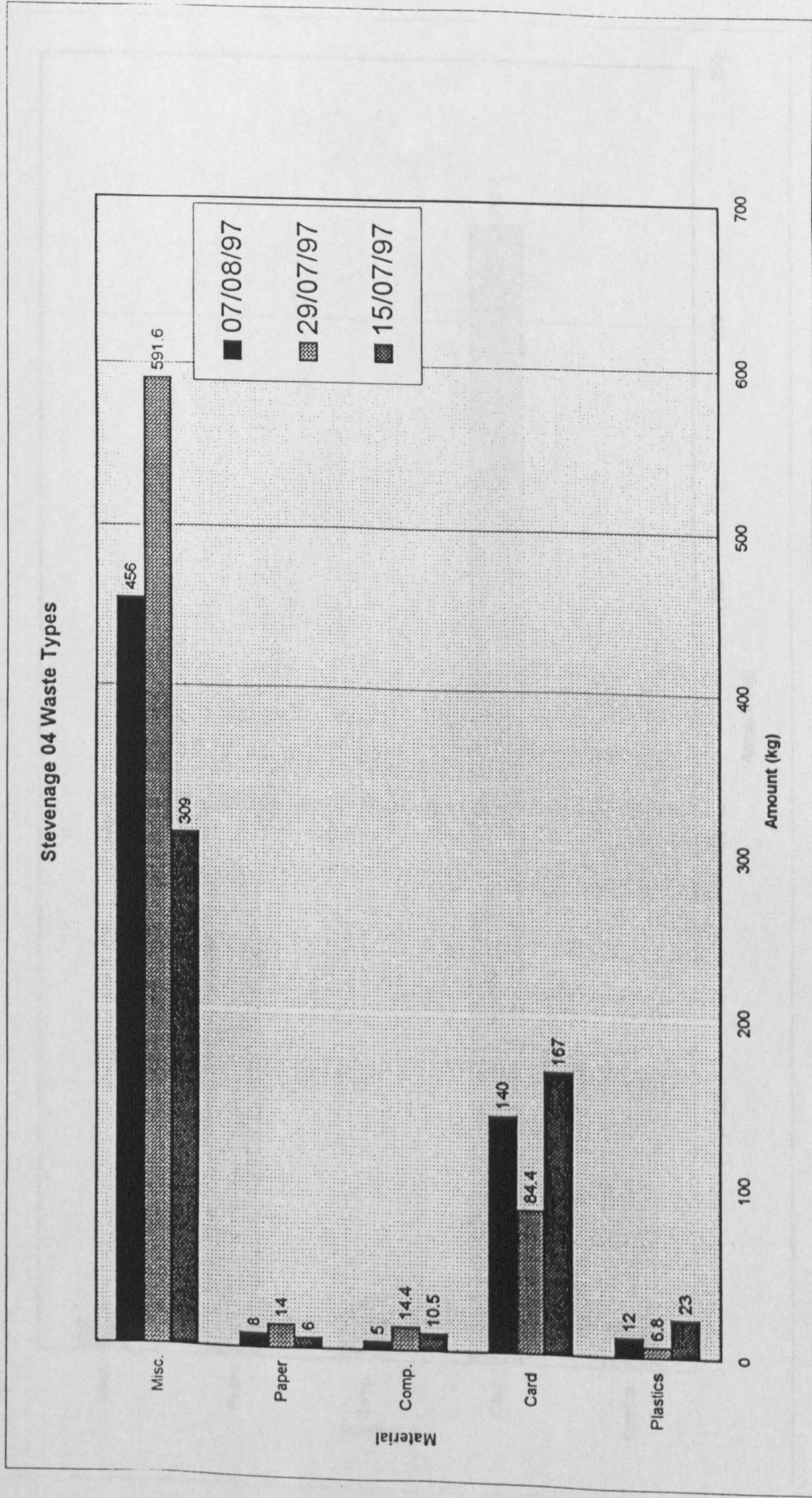


Stevenage 04 Waste Types (07/08/97)



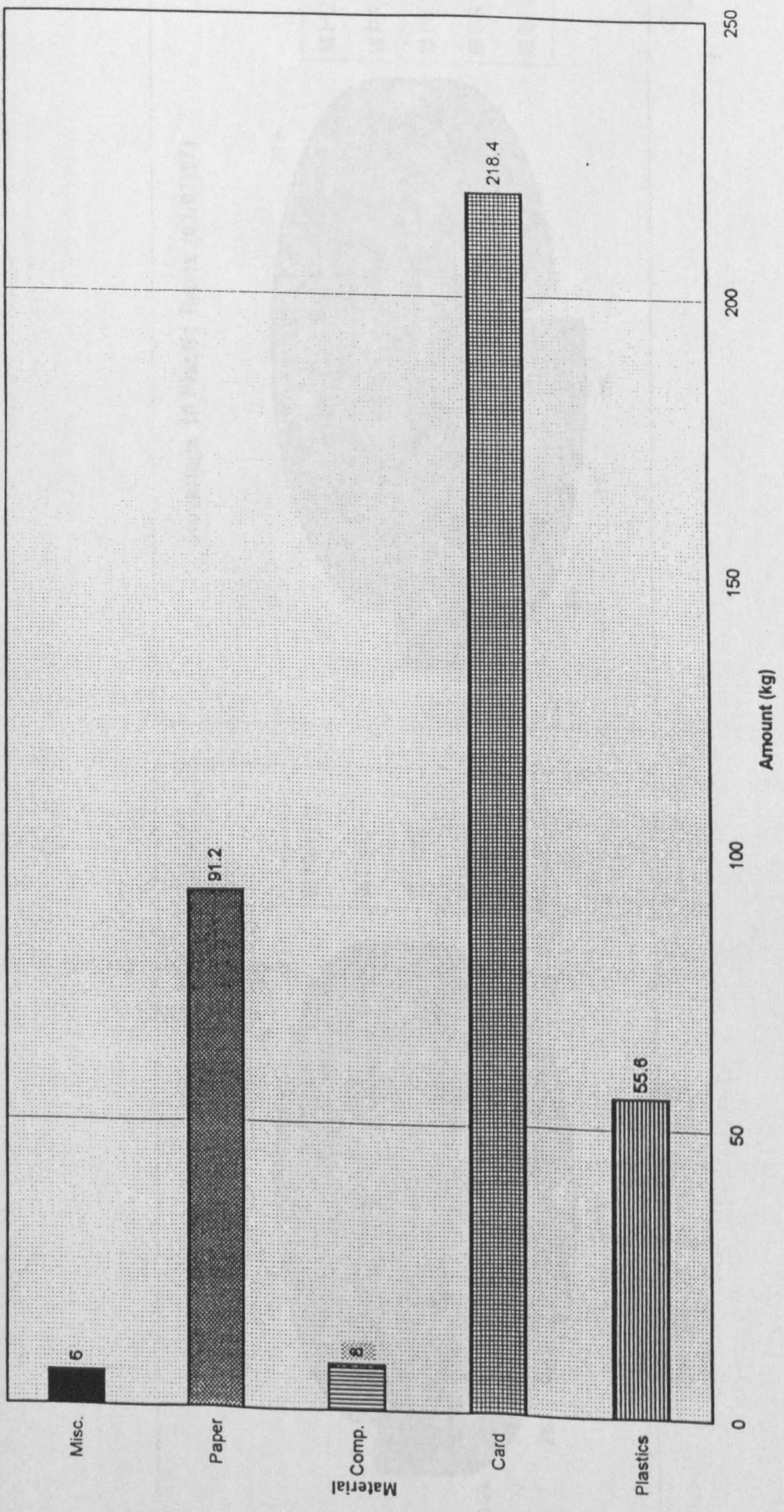
Stevenage 04 Plastic Types (07/08/97)

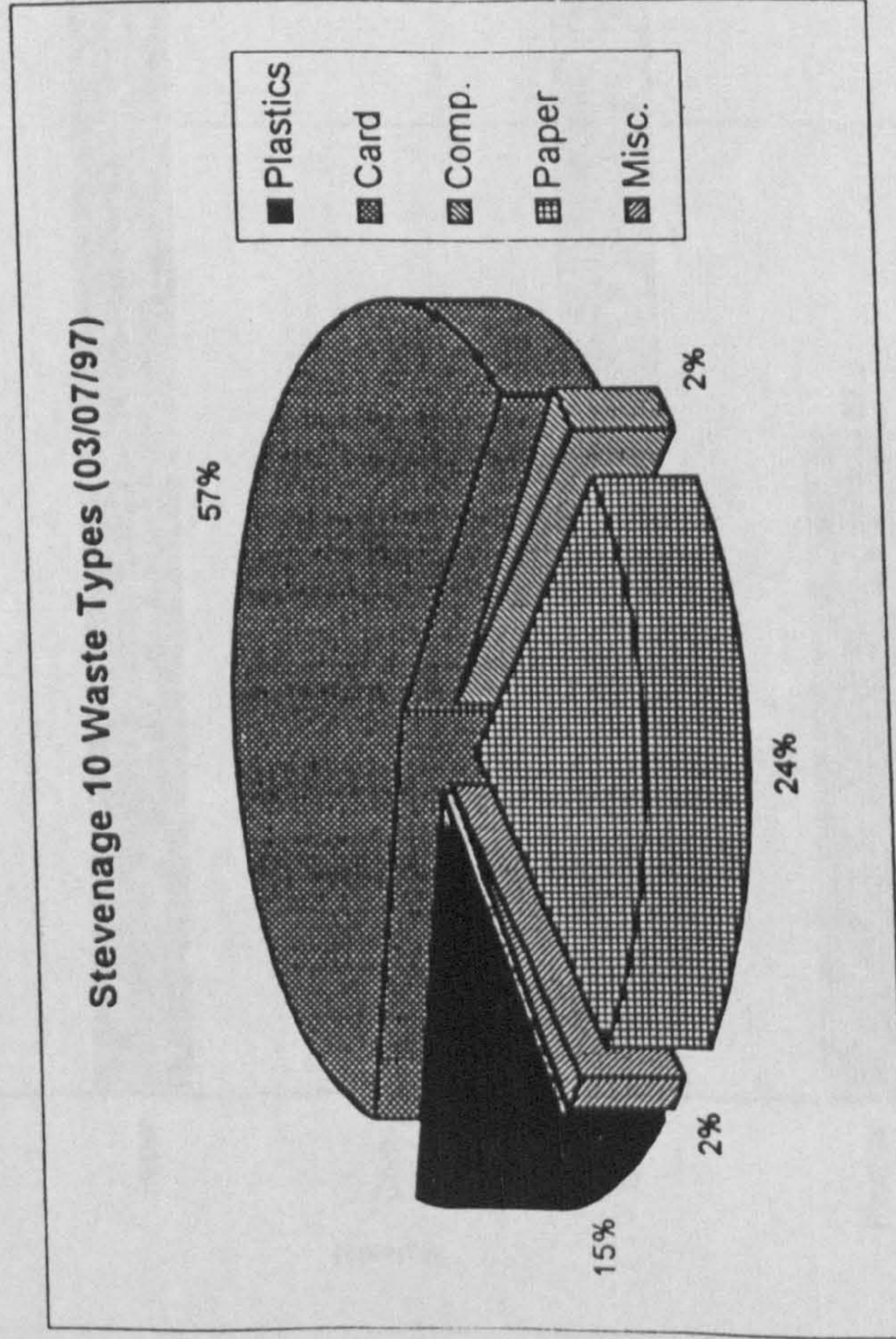
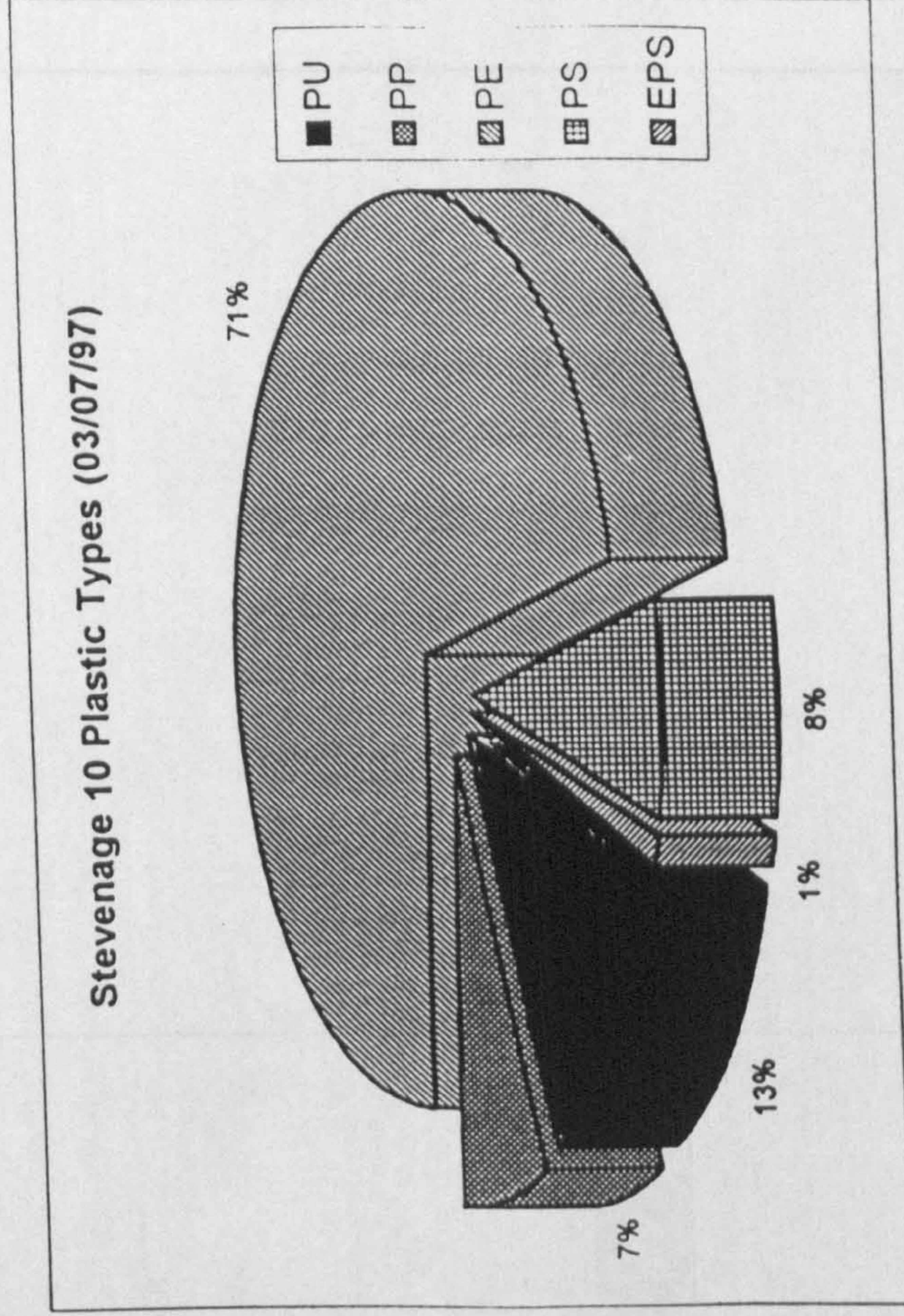




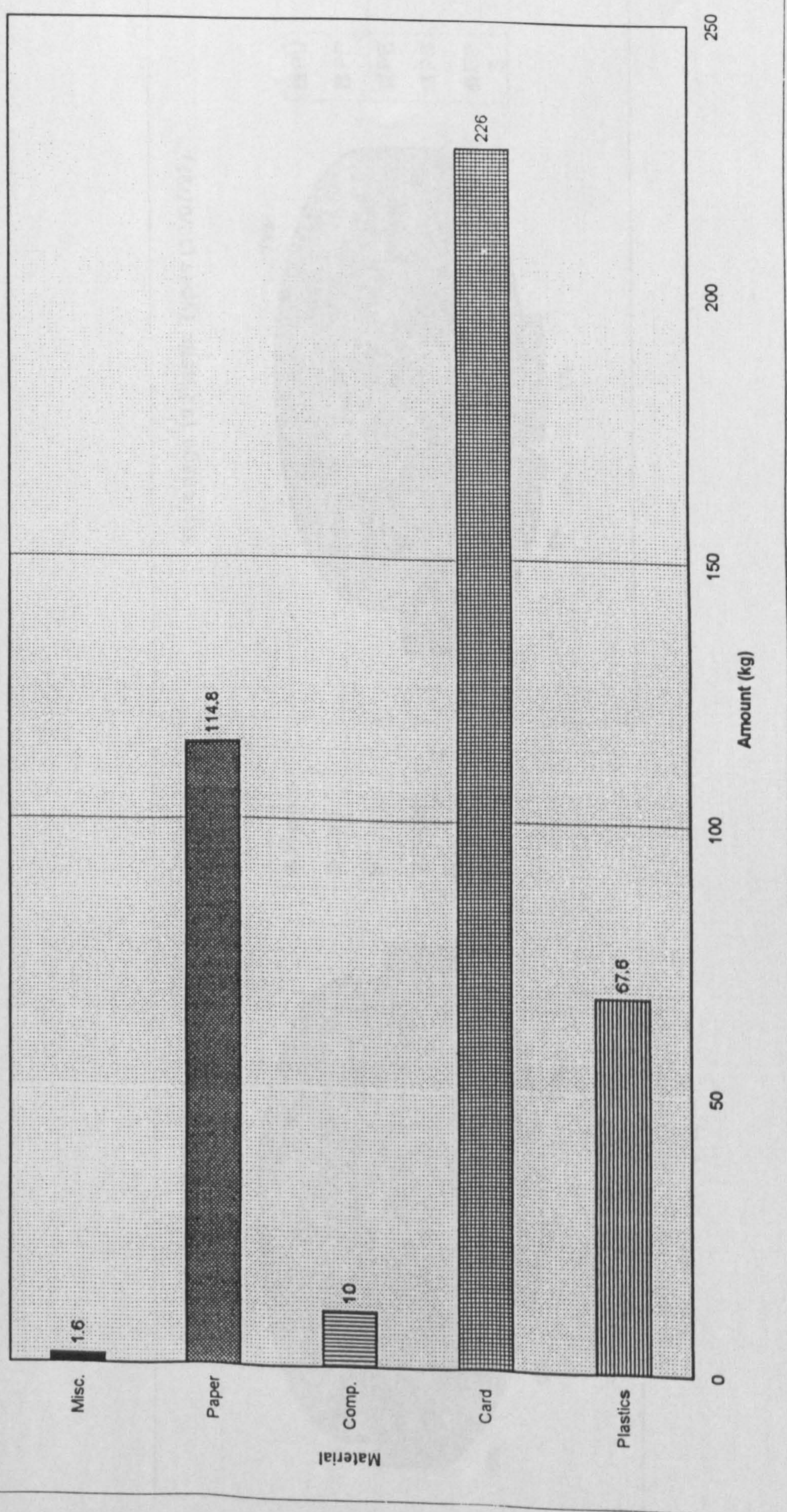
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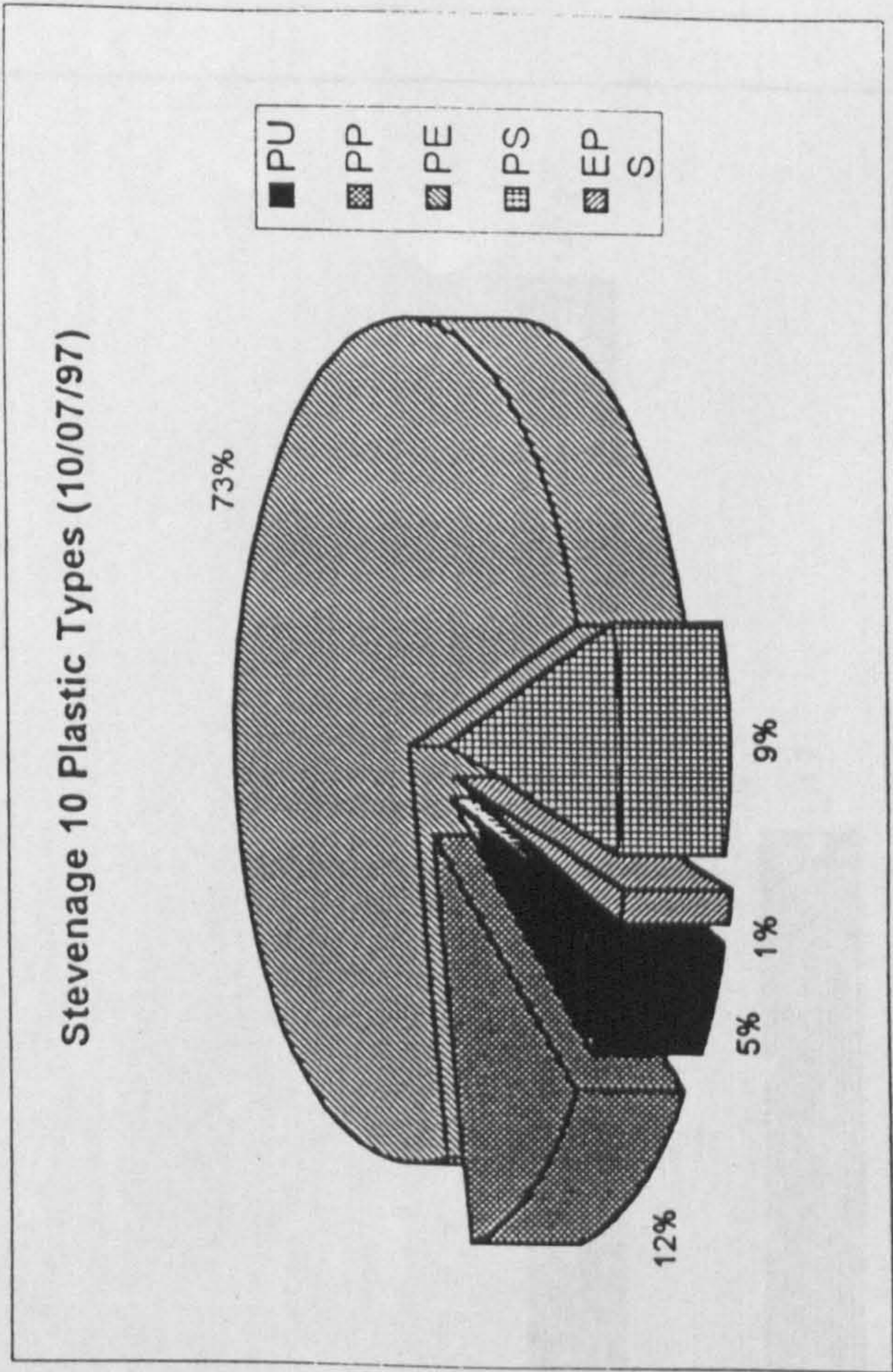
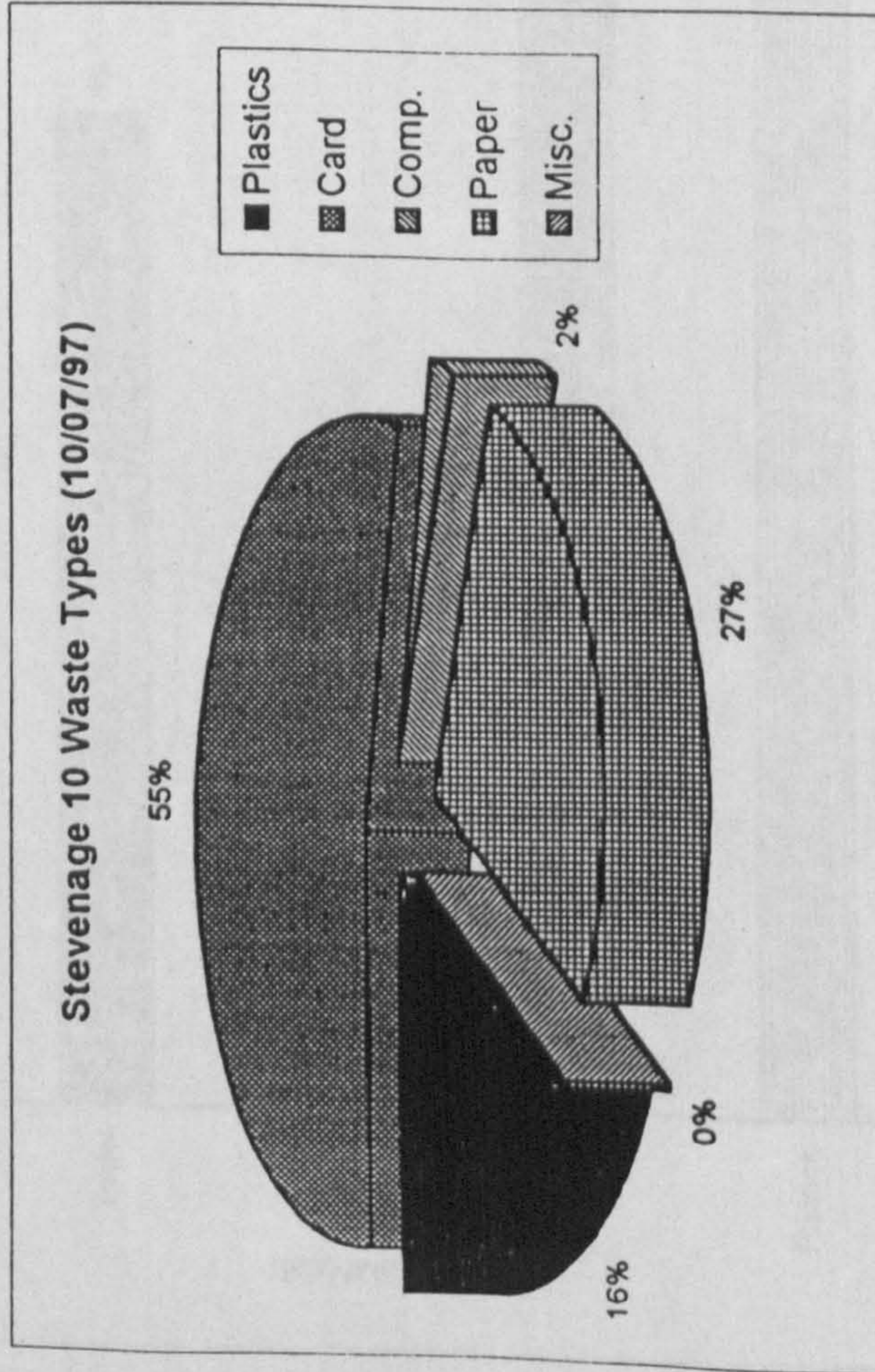
Stevenage 10 Waste Types (03/07/97)



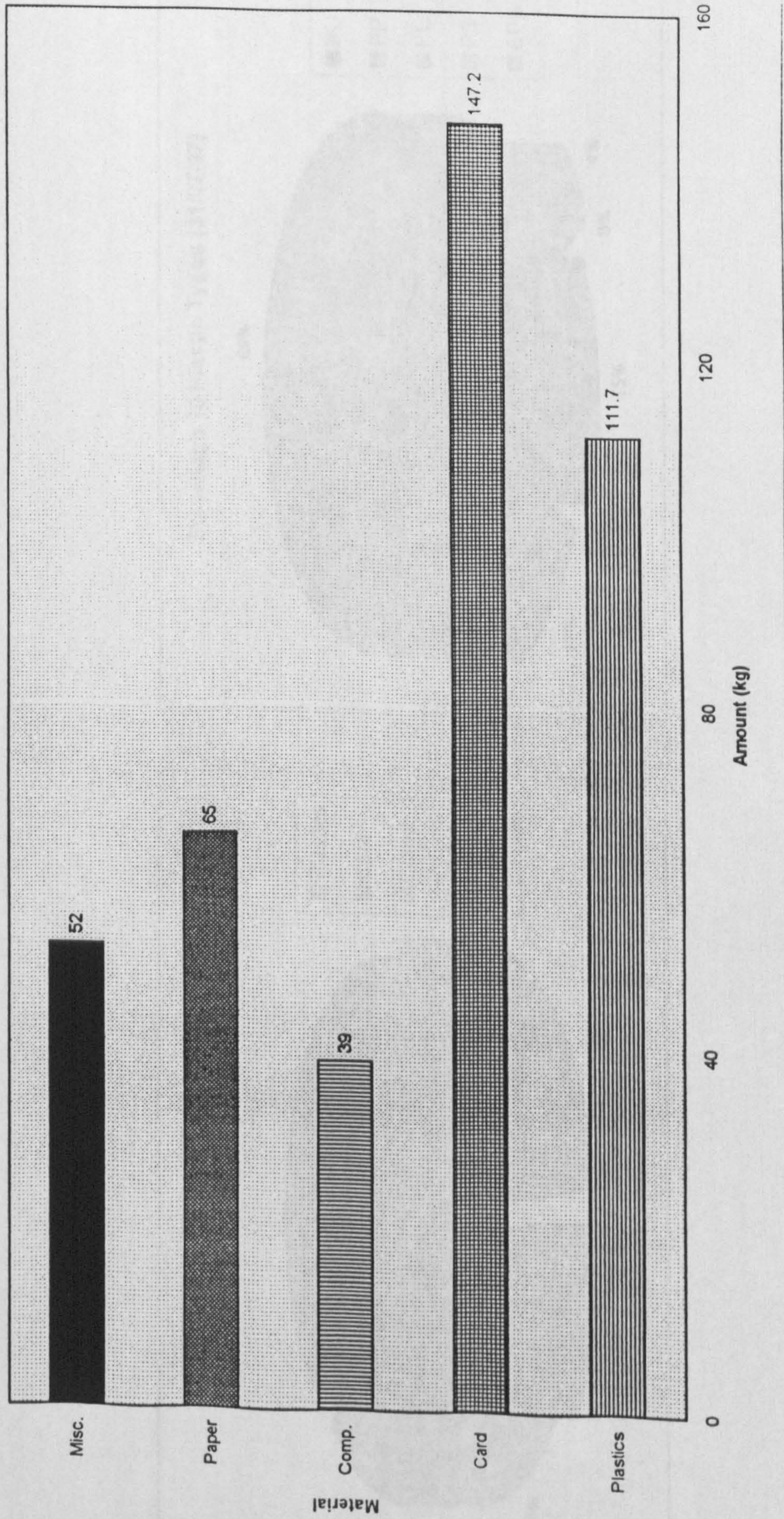


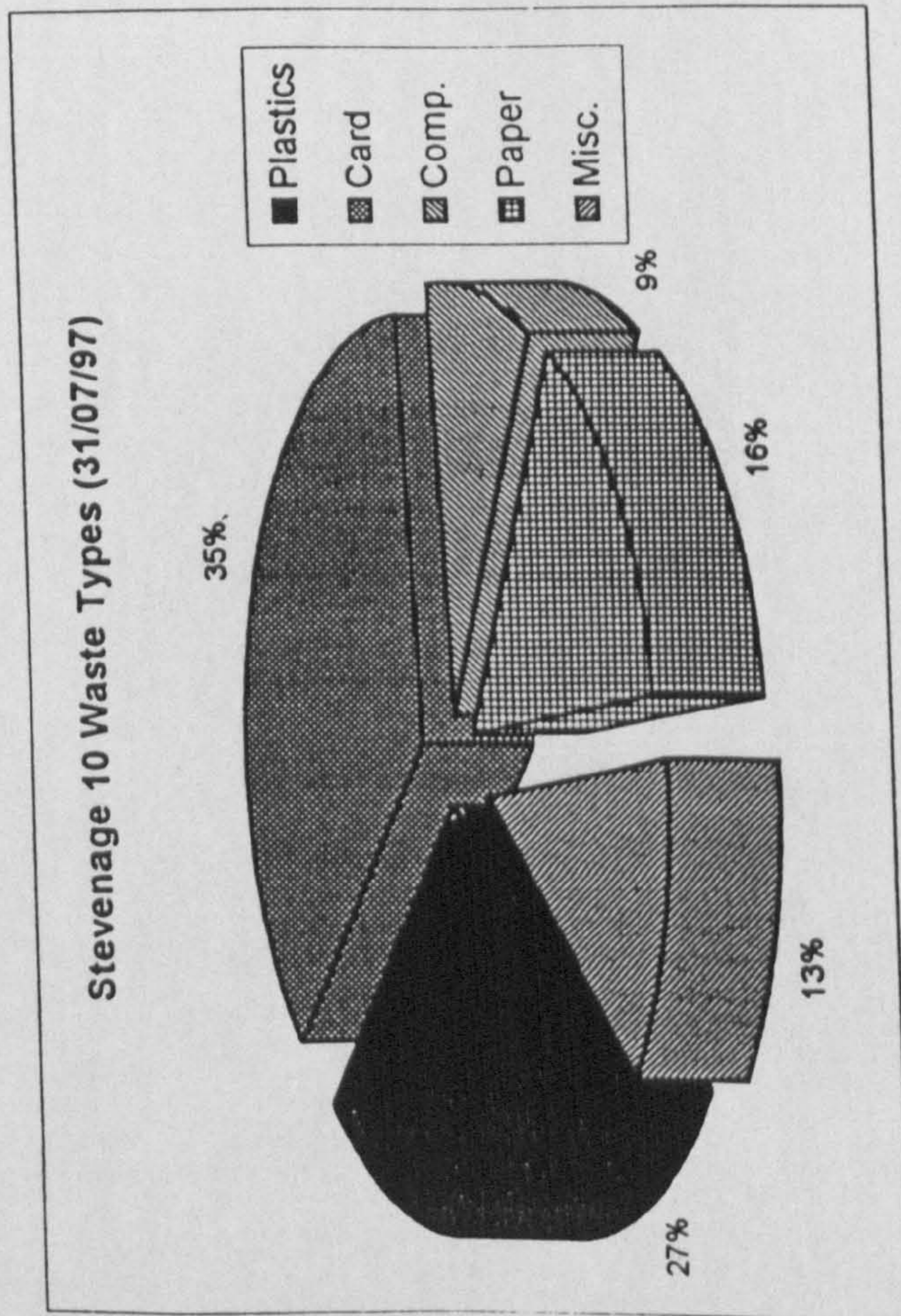
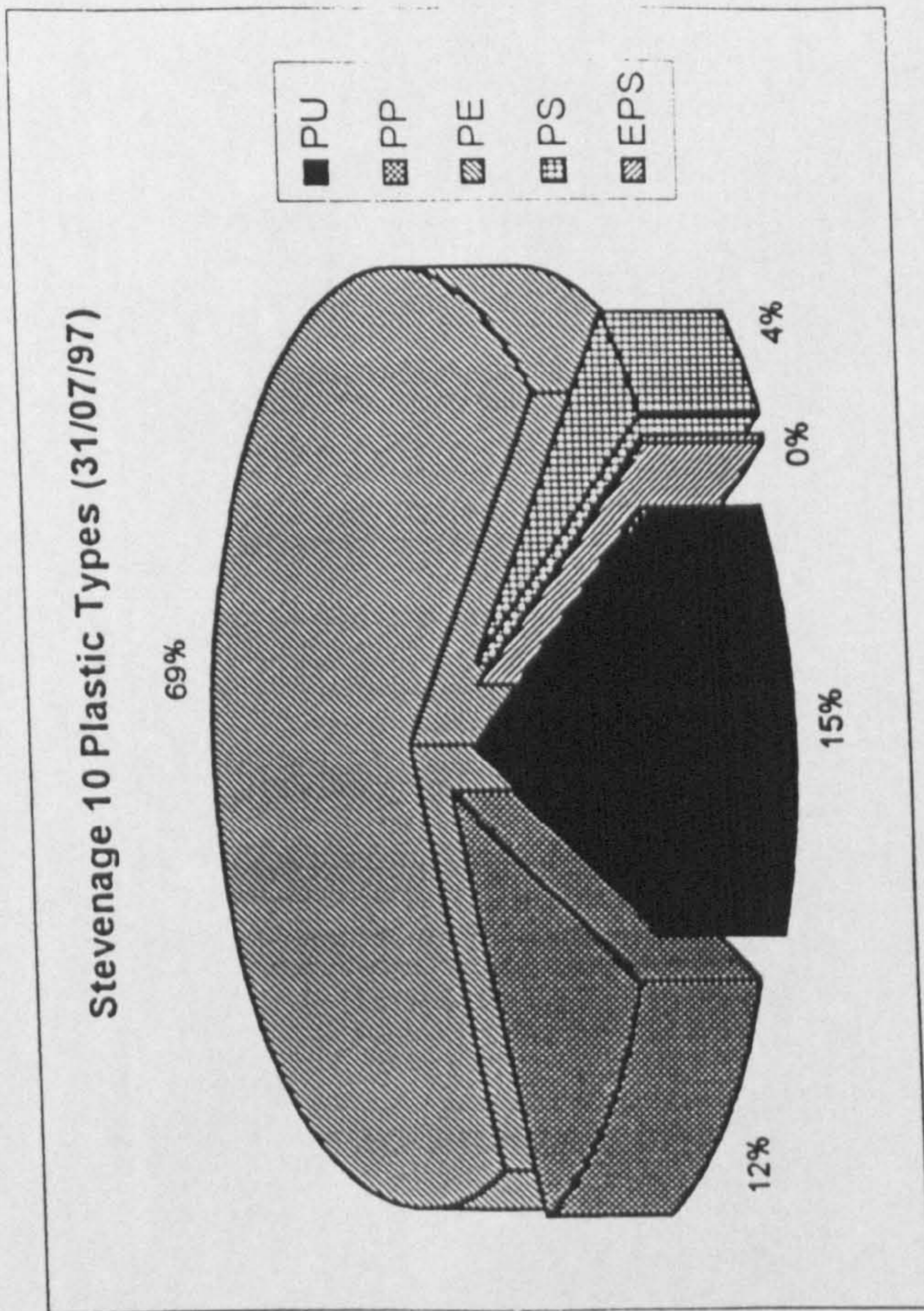
Stevenage 10 Waste Types (10/07/97)

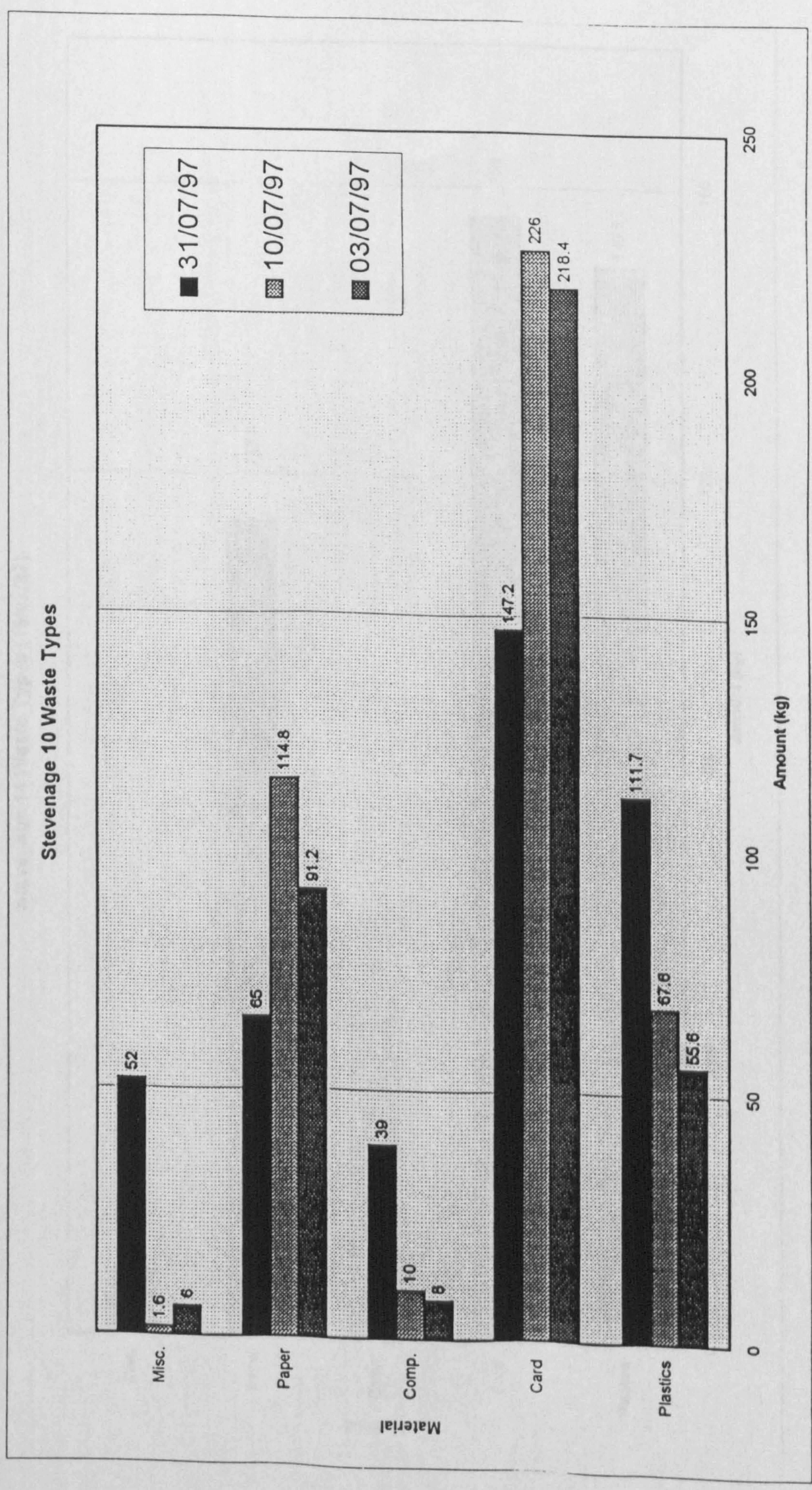




Stevenage 10 Waste Types (31/07/97)

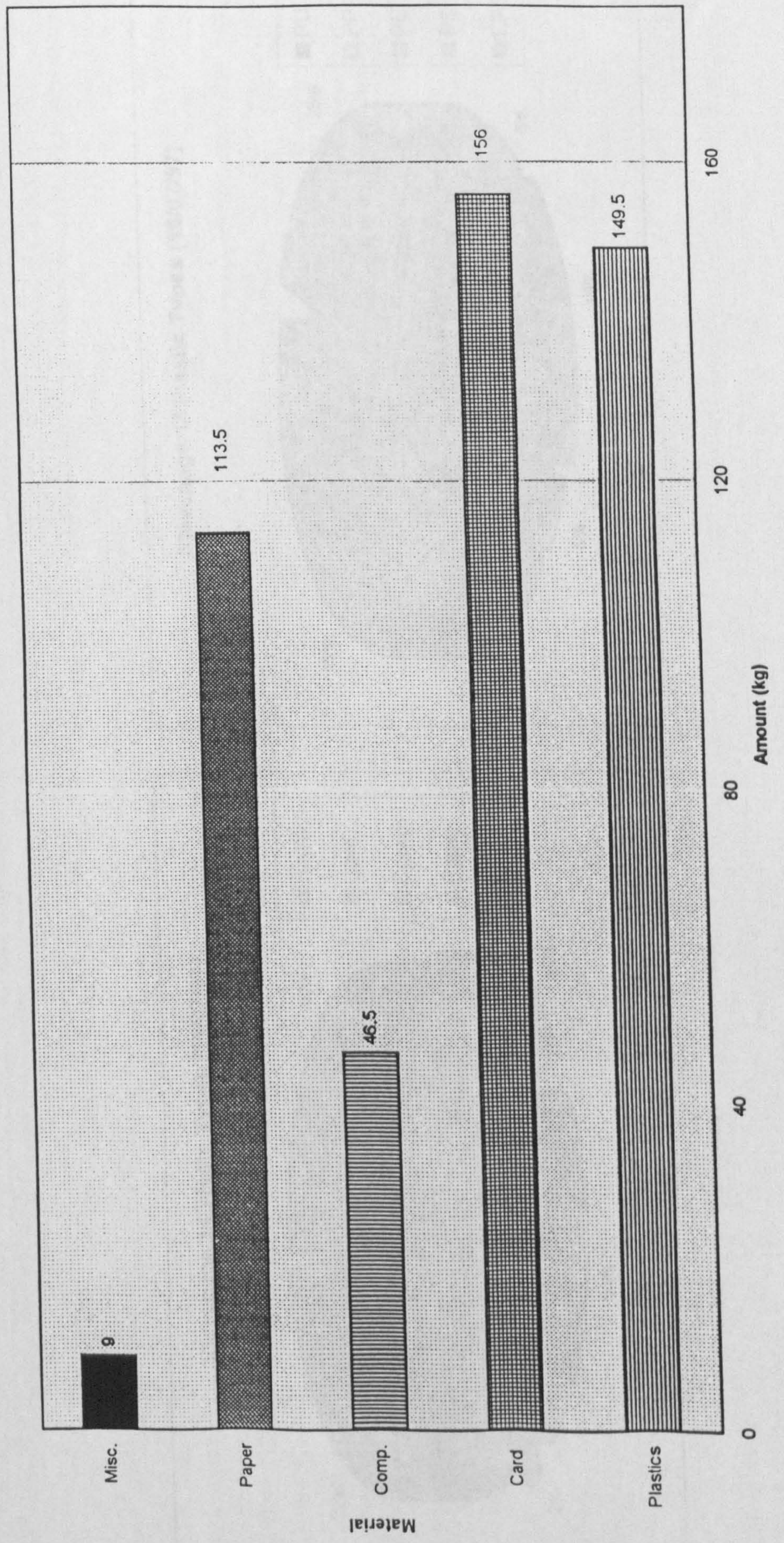


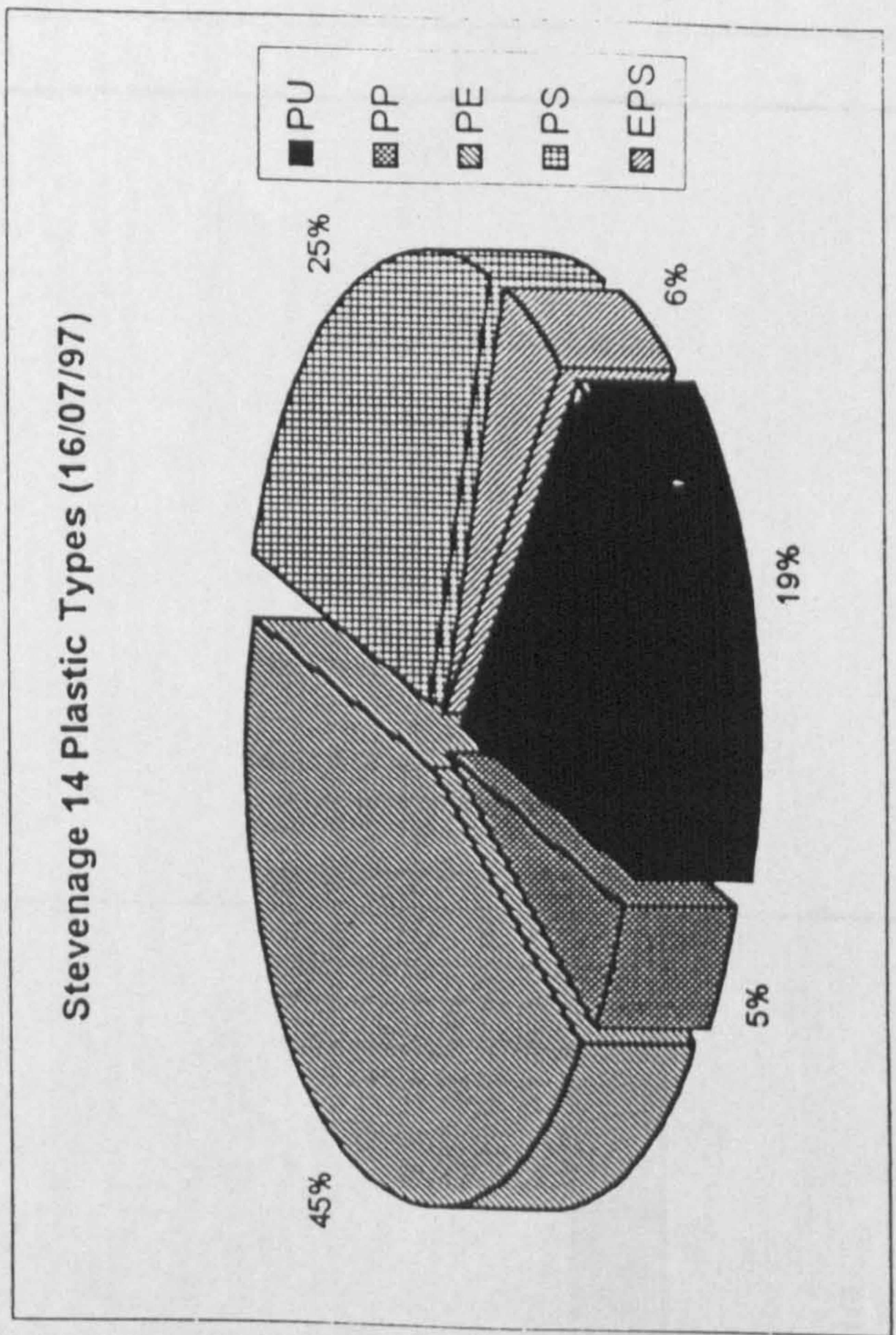
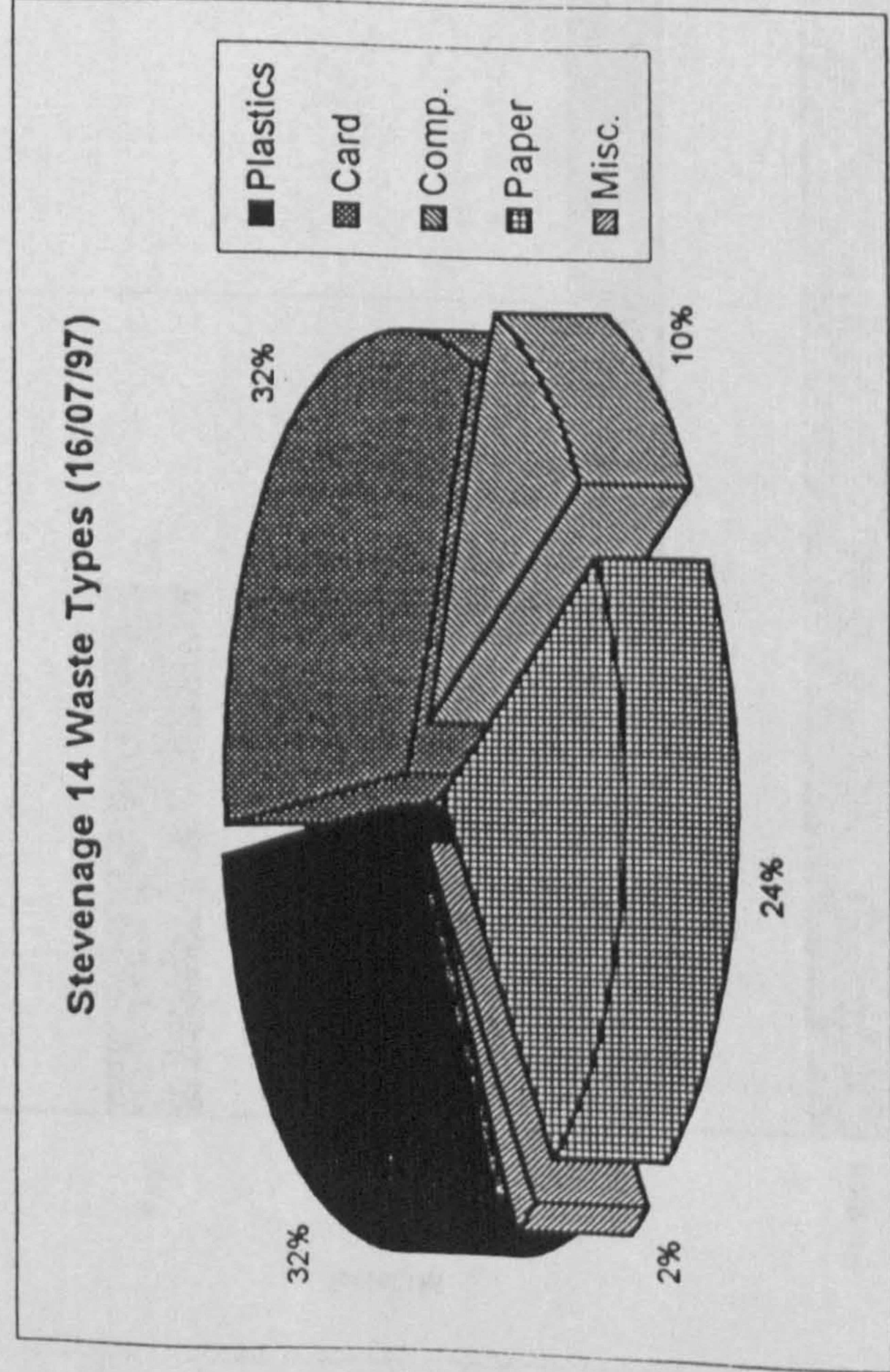




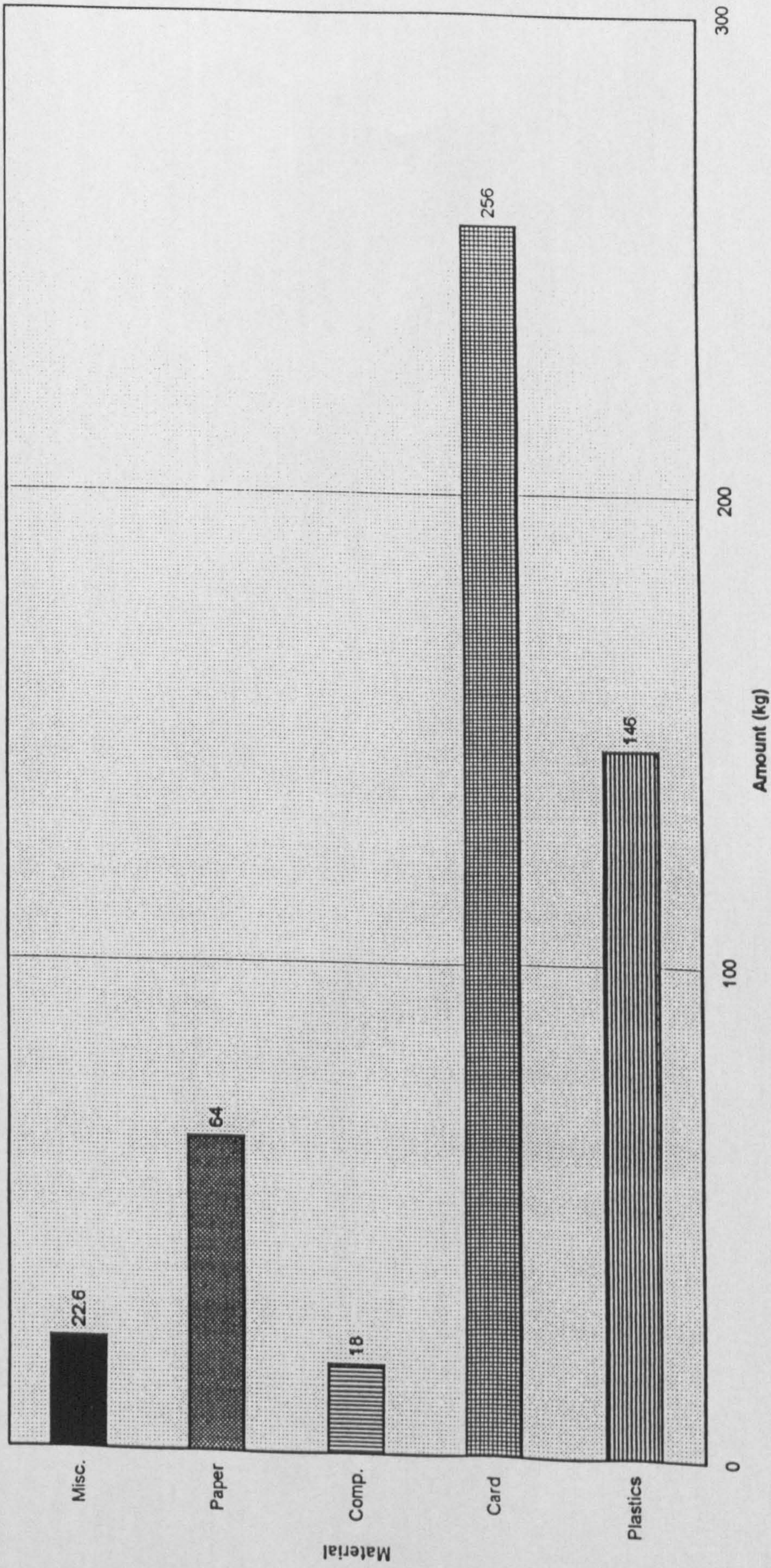
Total

Stevenage 14 Waste Types (16/07/97)

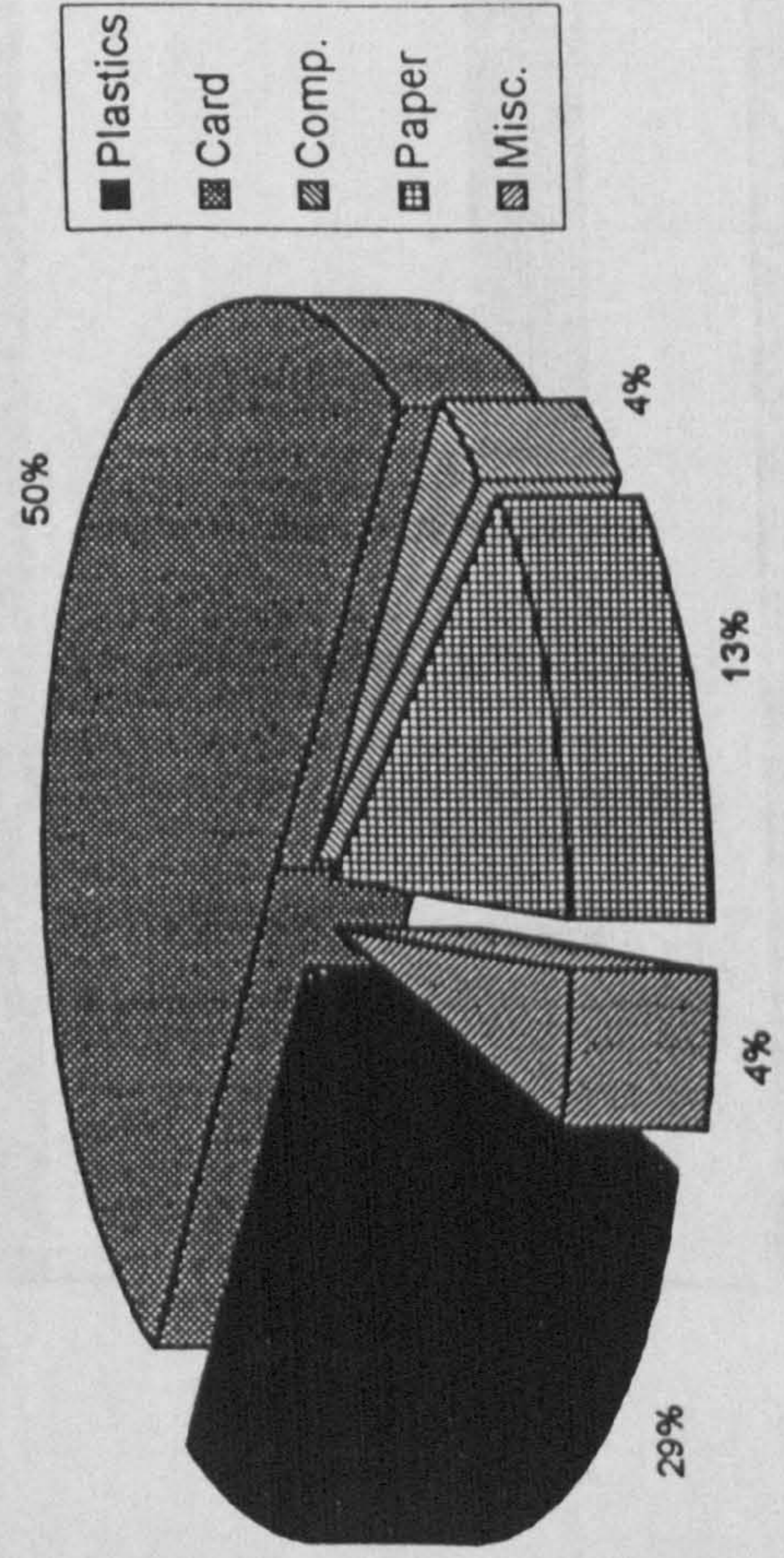




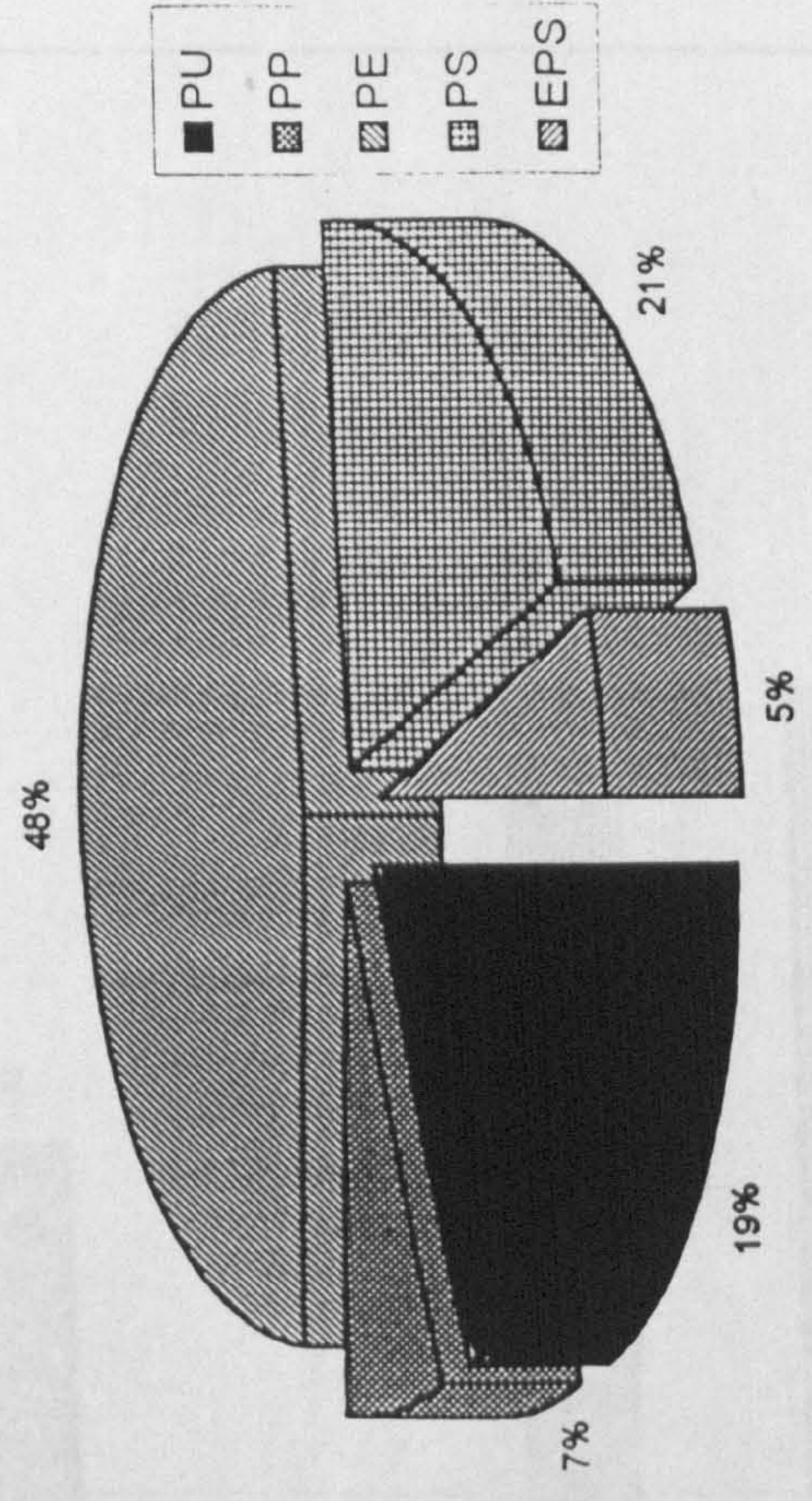
Stevenage 14 Waste Types (30/07/97)



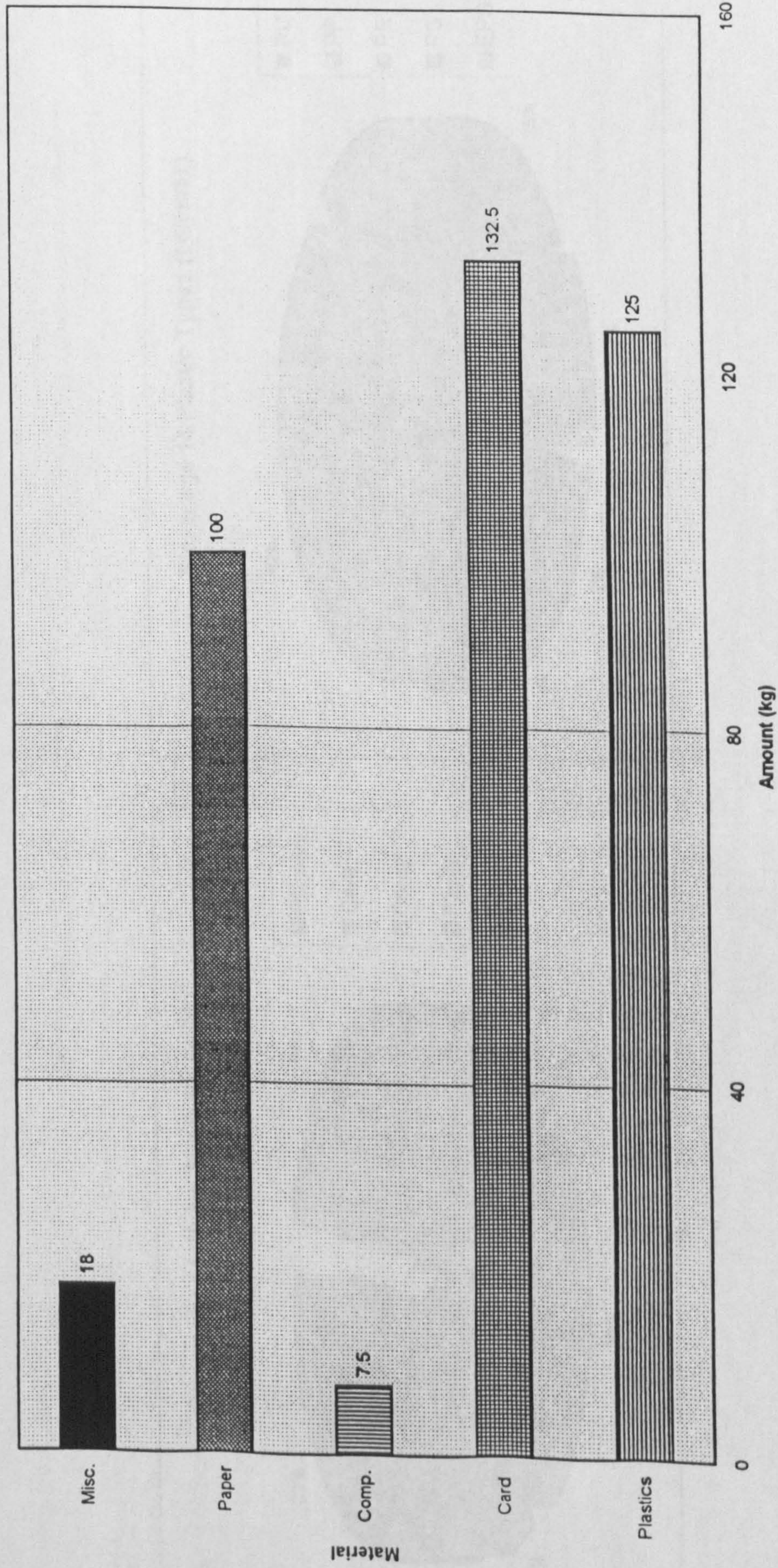
Stevenage 14 Waste Types (30/07/97)



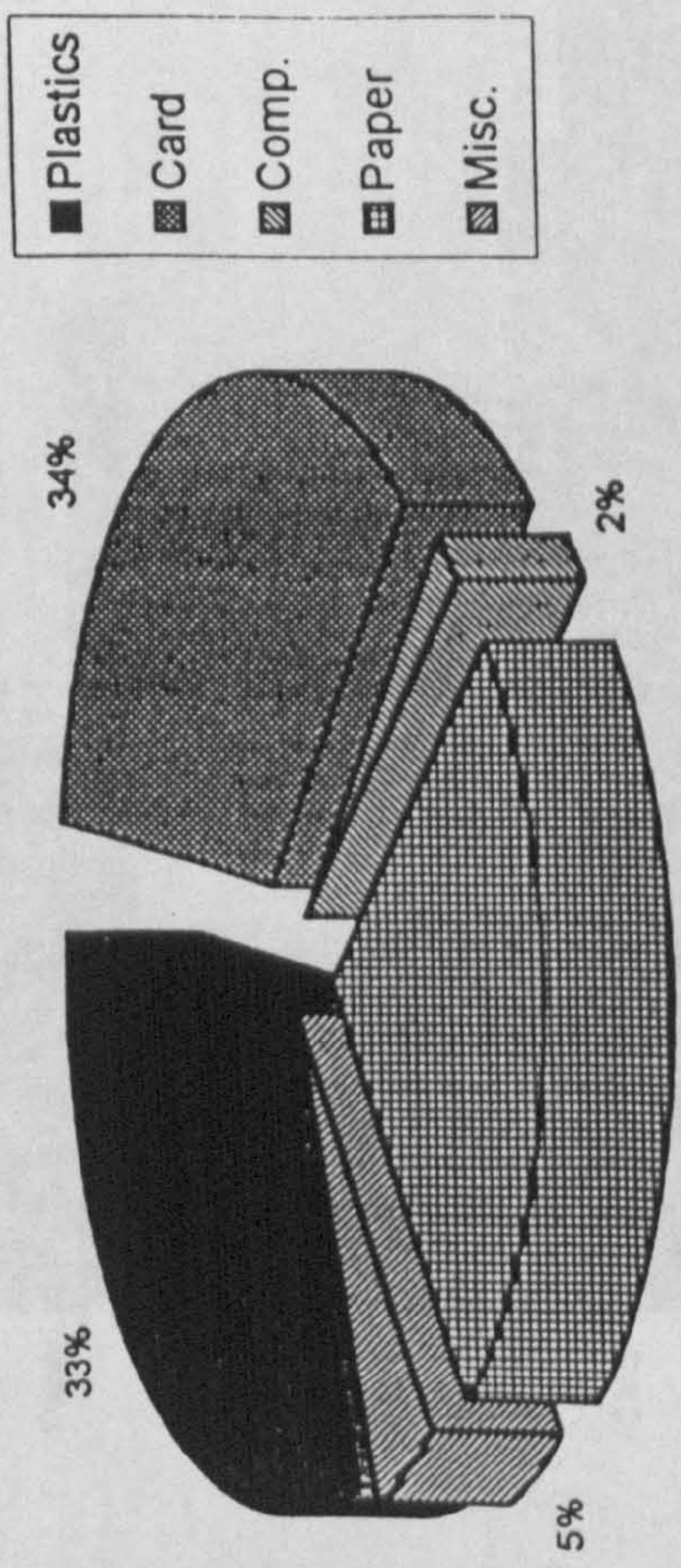
Stevenage 14 Plastic Types (30/07/97)



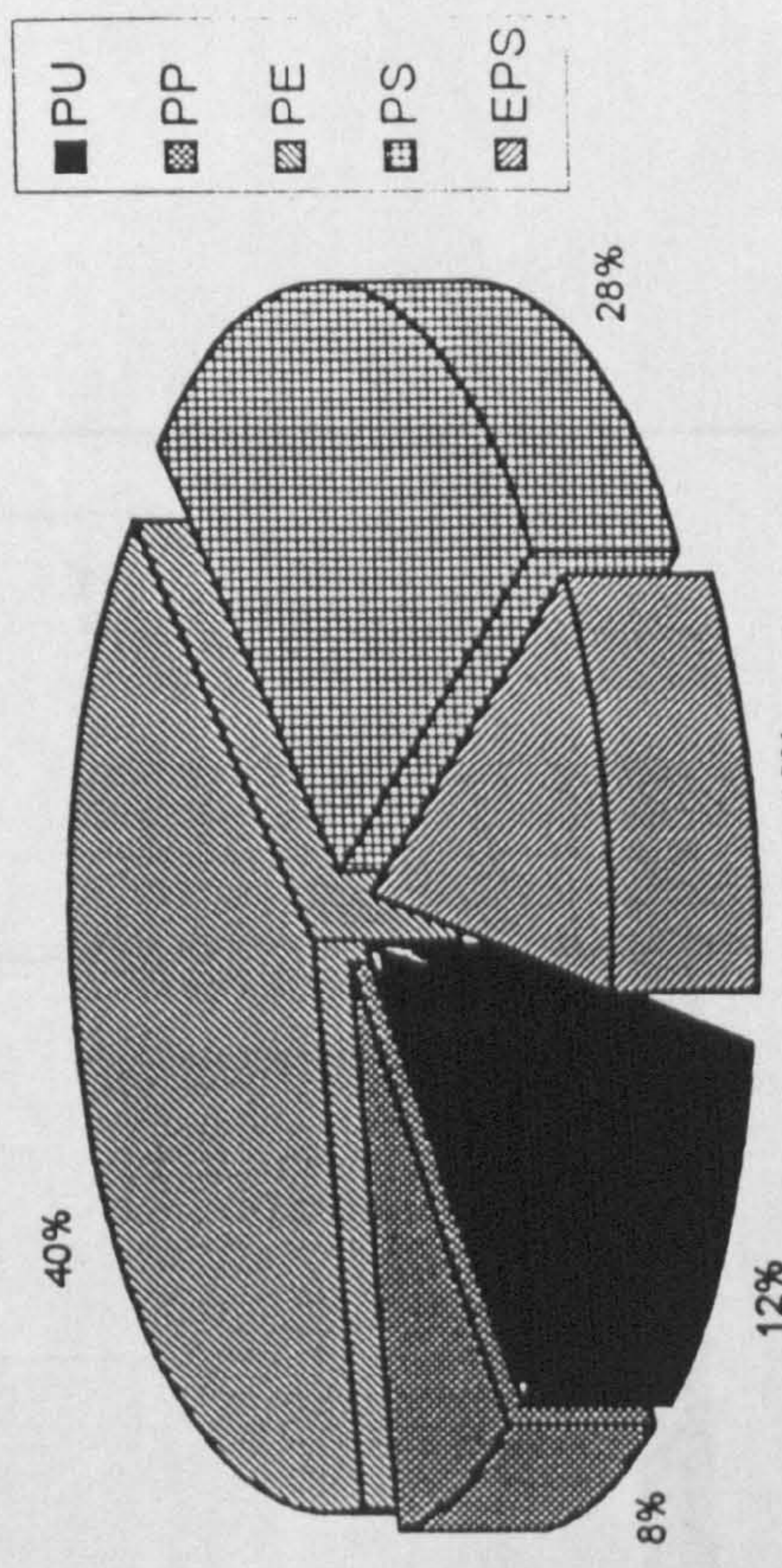
Stevenage 14 Waste Types (06/08/97)



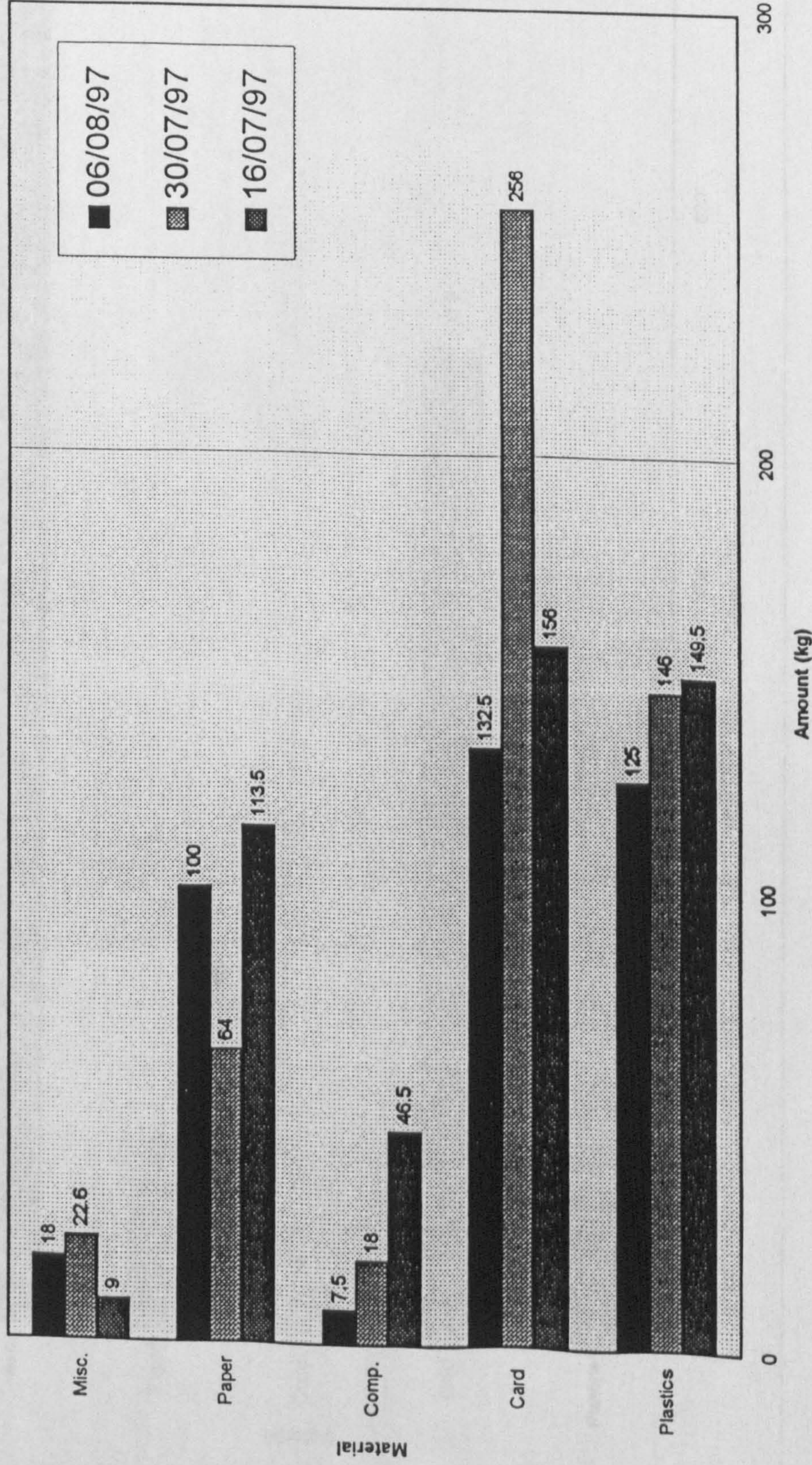
Stevenage 14 Waste Types (06/08/97)



Stevenage 14 Plastic Types (06/08/97)

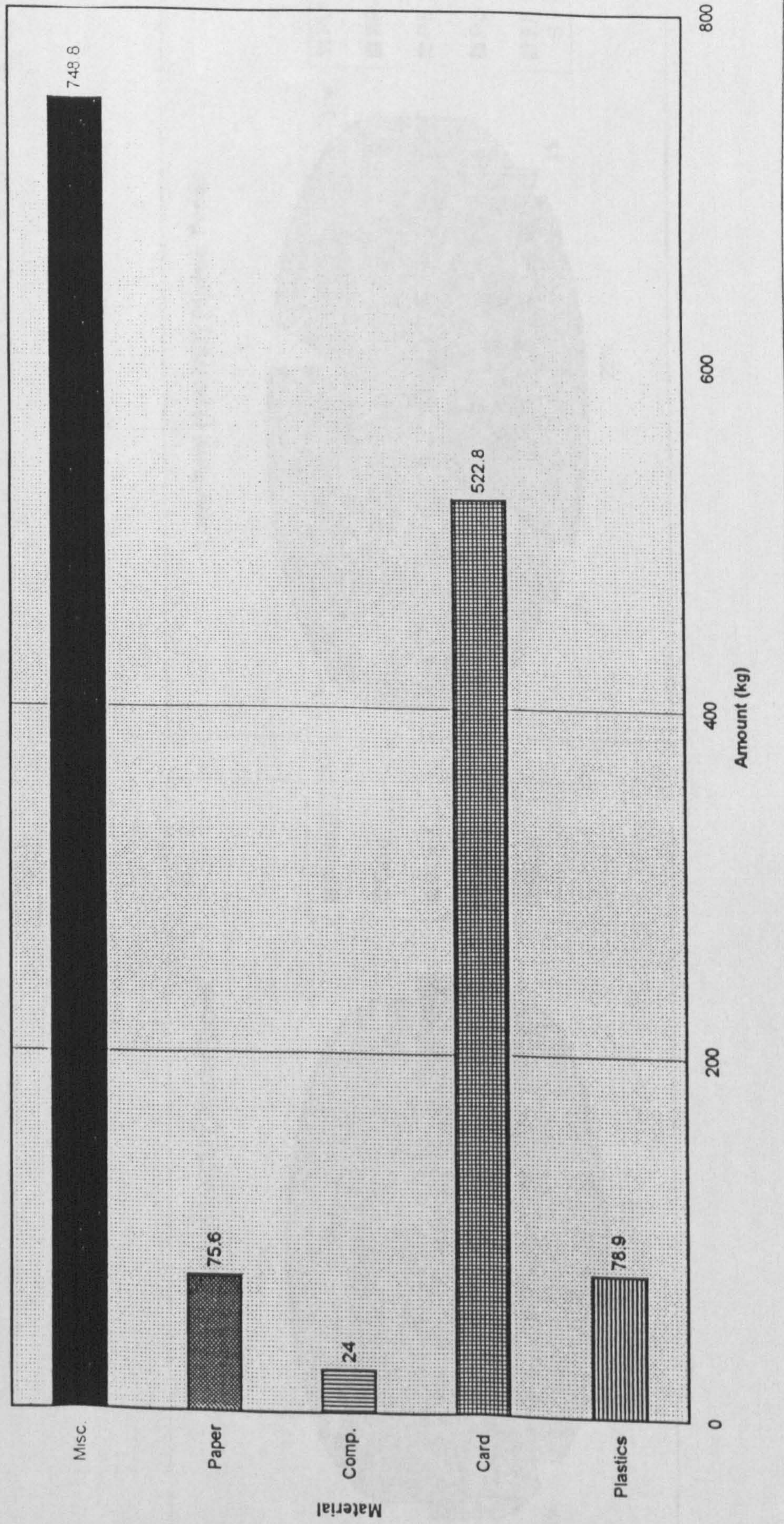


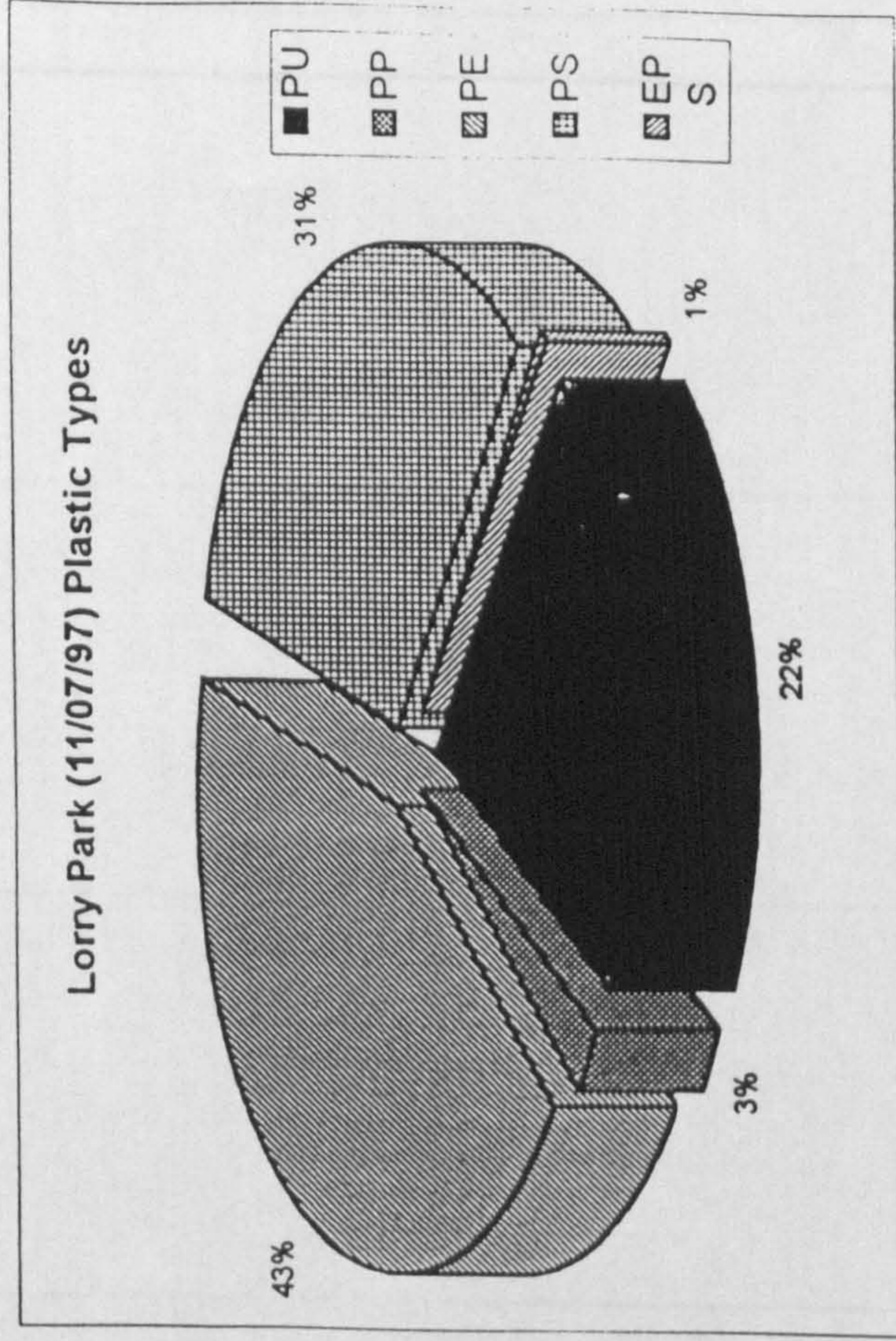
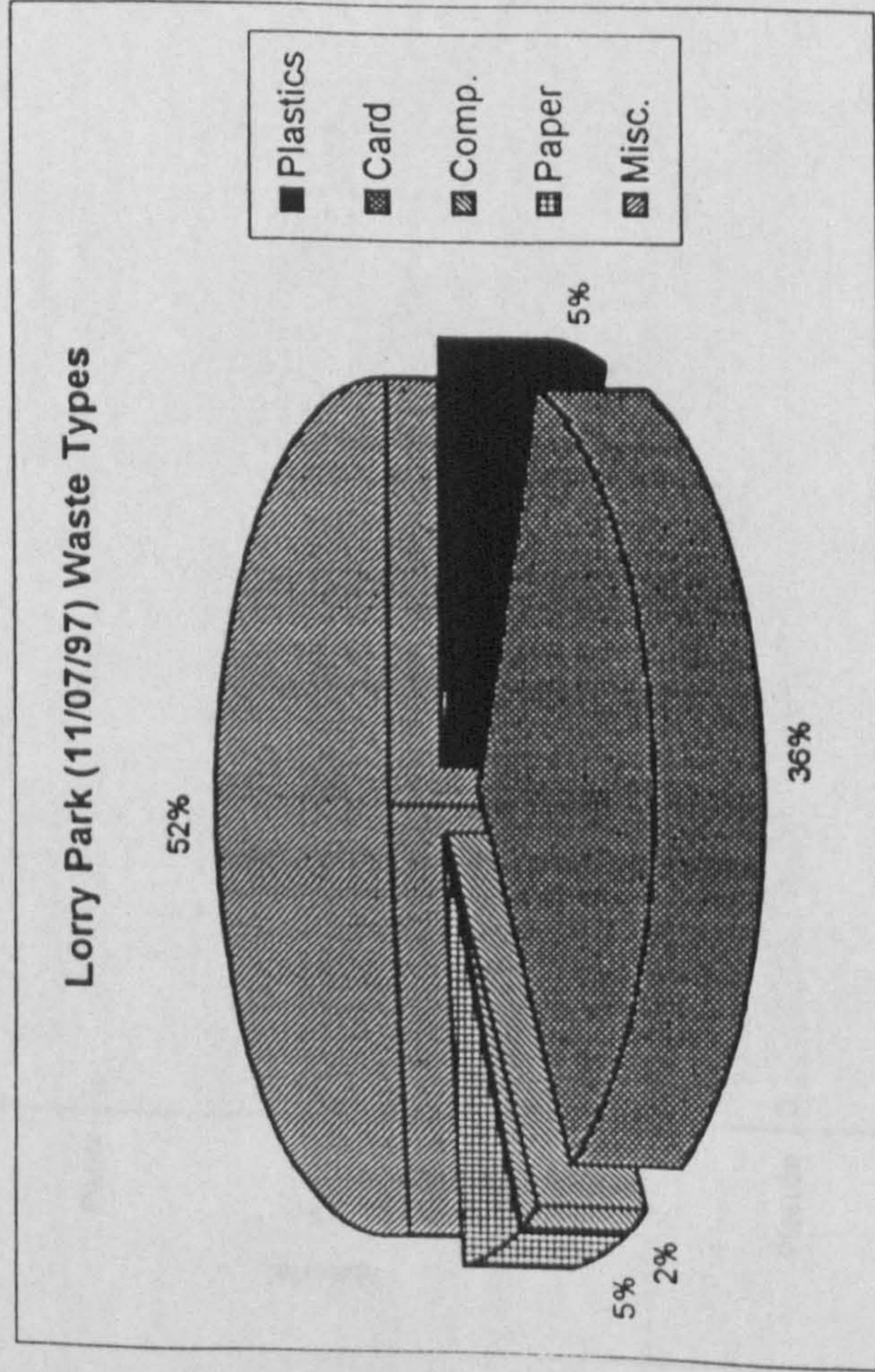
Stevenage 14 Waste Types



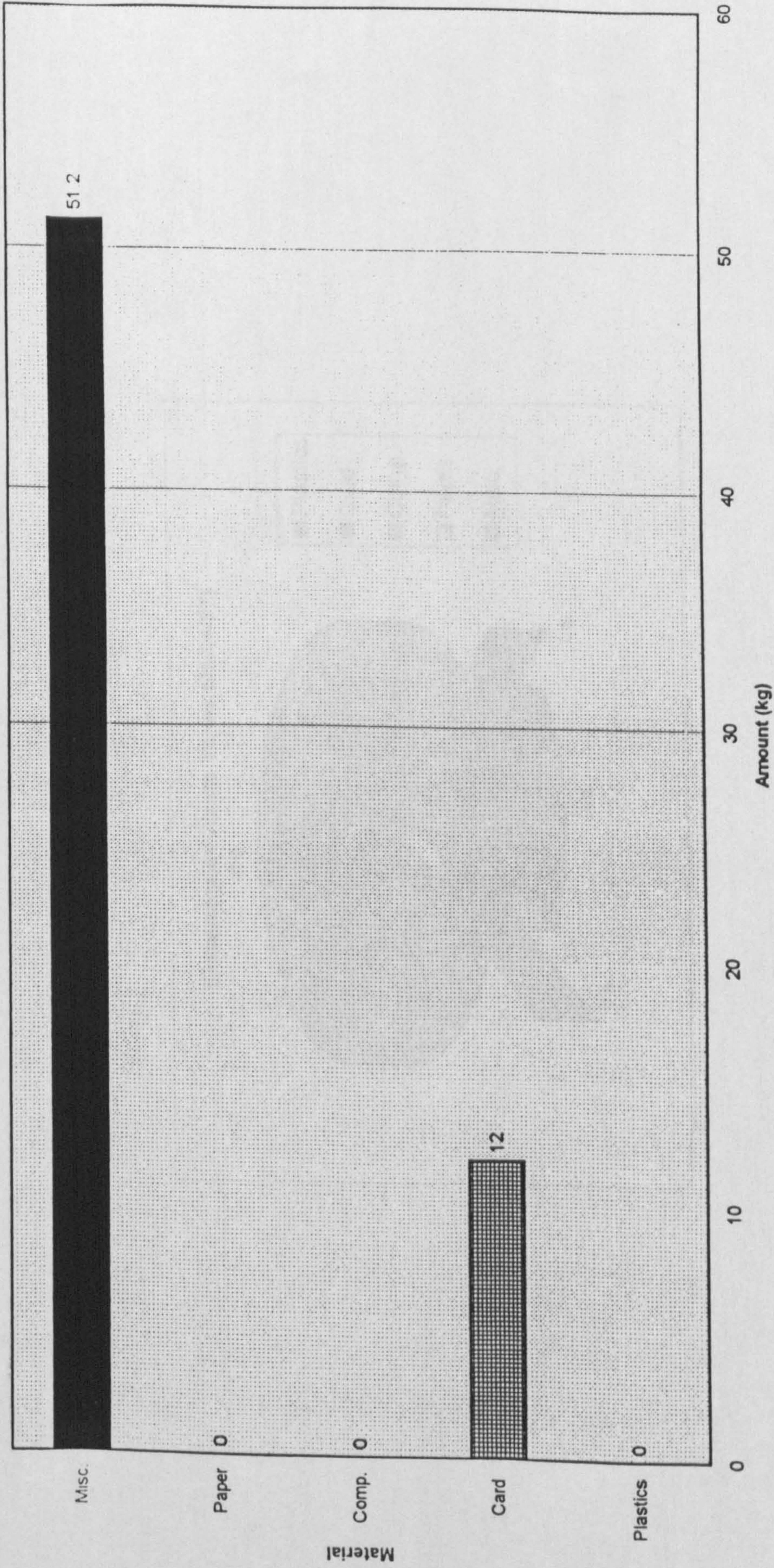
Total

Lorry Park (11/07/97) Waste Types

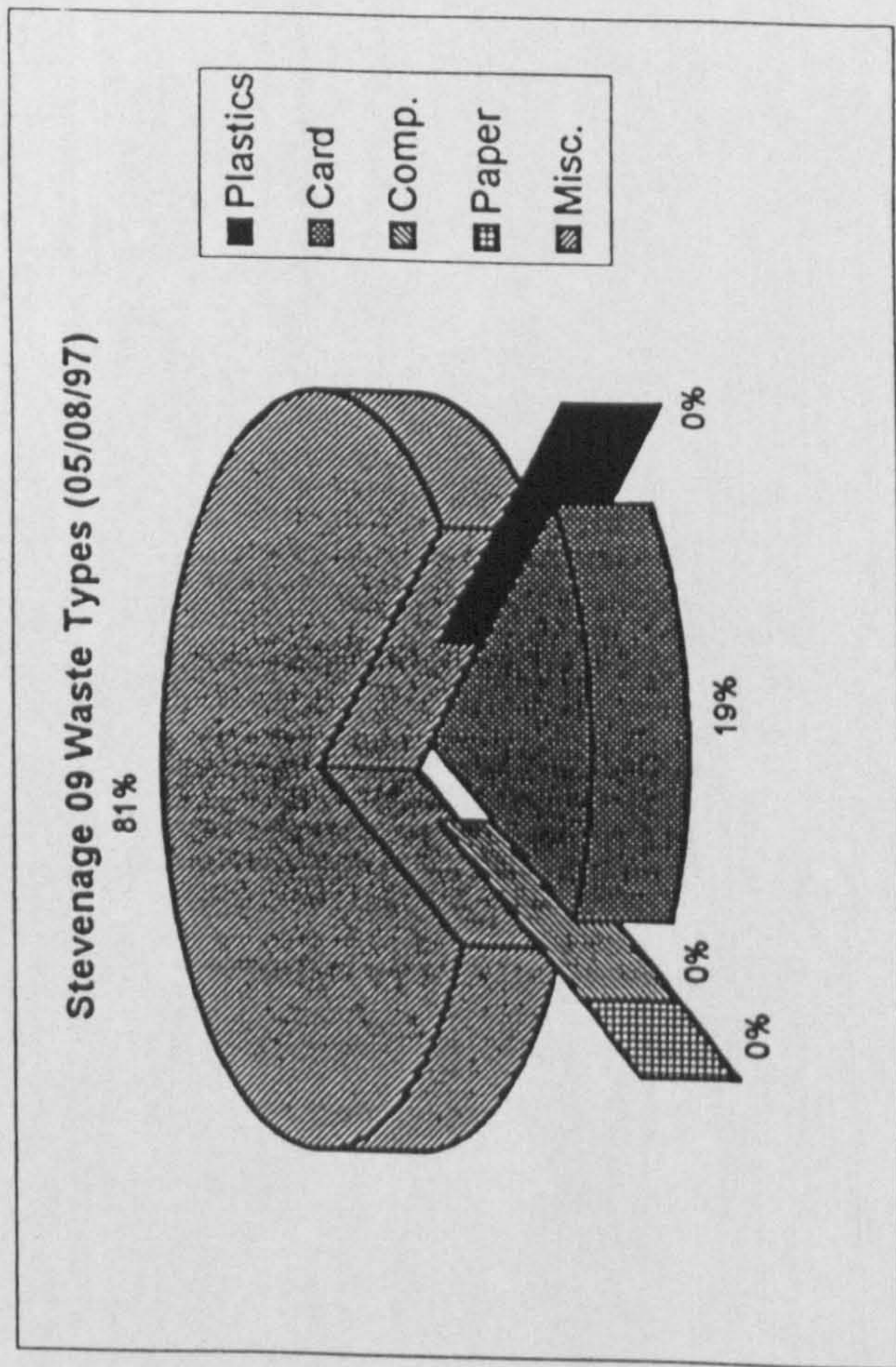




Stevenage 09 Waste Types (05/08/97)



APPENDIX D
PROTOCOLS



APPENDIX D

PROTOCOLS

WASTE AUDIT PROTOCOL: ICL Retail

Date: . . / / 97

1. What is your role within the company and what are your duties?

.....
.....

2. How much packaging does your department buy annually?

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.....
.....

3. What materials are they constructed from?

.....
.....
.....

4. Where do you get your packaging from?

.....
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.....
.....

5. Where does the packaging go within ICL, i.e. who uses the packaging that you buy?

.....
.....
.....

6. Is any of the packaging you buy re-usable? If so, how much do you re-use?

.....
.....
.....

7. Is there any documentation to show how much packaging is bought annually?

.....
.....
.....
.....

8. Is there anyone else that you think could help us to determine the flow of packaging through the Stevenage site?

..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....

WASTE AUDIT PROTOCOL: ICL Retail Integration Centre Date: . / . / 97

1 What waste is produced? e.g. scrap equipment, packaging, non-packaging

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.....
.....
.....

2 What materials occur in the waste? Card, metal types, plastic types:

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3. Where is the waste put? e.g. skips, bins, bags. Is it segregated?

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4. What is your understanding of the UK Packaging Regulations?

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5. What problems has your department found since the implementation of the Packaging Regulations?

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6. What is being done to ensure ICL meet their Producer Obligations?

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7. How much packaging does your department buy (ANNUALLY)?

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8. What materials are they constructed from?

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.....
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9. What is the packaging used for? (Tertiary/Secondary/Primary)

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.....
.....

10. Where does the packaging come from and where does it go?

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.....
.....
.....

11. Is any of the packaging re-used? How much of the packaging waste is reused? How is the packaging reused?

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.....
.....

14. How much of the packaging materials are recycled? What materials are recycled?

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.....

15. Do you know where the waste goes? Can you determine where each material type goes?

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.....
.....
.....

16. Is there any documentation for the removal and disposal of the wastes? Is it checked and monitored?

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.....
.....

14. Is there anyone else you can think of that we should talk to?

..... Position:.....
..... Position:.....
..... Position:.....
..... Position:.....

WASTE AUDIT PROTOCOL: RCO Support Services

Date: .. / .. /97

1. Are you and your team aware of the ICL Environmental Corporate Statement?

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.....
.....
.....

2. What efforts are made to encourage recycling around the Stevenage site?

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How could this be improved?

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3. Are you aware of what backdoor arisings are, and their importance?

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4. How easy do you think it would be to separate our waste, enabling easy reclamation of backdoor arisings?

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.....
.....

Do you think separation presents a large financial barrier? If so, why?

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5. Do any of your staff undergo training before beginning work at ICL. Do you think it would be beneficial to train staff?

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6. When are the skips collected (SME/Severnside/Porters)?

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.....

7. Who is responsible on site for the collection of the skips (signatures, etc.)?

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.....

8. What are the costs charged to ICL by Shanks & McEwan/Severnside/Porters? What is the breakdown of these costs?

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.....
.....

9. Who is responsible for scrap electronic components in STE 10 and 14?

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11. Is there anyone else you can think of that we should talk to?

..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....

WASTE AUDIT PROTOCOL: WML

Date: / /97

1. Are you and your team aware of the ICL Environmental Corporate Statement?

.....
.....
.....
.....
.....

2. What efforts are made to encourage recycling around the Stevenage site?

.....
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.....
.....

How could this be improved?

.....
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.....
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.....

3. Are you aware of what backdoor arisings are, and their importance?

.....
.....
.....
.....

4. How easy do you think it would be to separate our waste, enabling easy reclamation of backdoor arisings?

.....
.....
.....
.....
.....

Do you think separation presents a large financial barrier? If so, why?

.....
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.....
.....

5. We noticed a large amount of plastic cups in STE 10's skip How much does ICL spend on plastic cups per year? Could this amount be reduced?

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.....
.....
.....
.....

6 When are the skips collected (SME/Sevenside/Porters)?

.....
.....
.....
.....
.....

7. Who is responsible on site for the collection of the skips (signatures, etc.)?

.....
.....
.....
.....
.....

8. What are the costs charged to ICL by Shanks & McEwan/Sevenside/Porters? What is the breakdown of these costs?

.....
.....
.....
.....
.....
.....

9. Who is responsible for scrap electronic components in STE 10?

.....
.....
.....
.....
.....

11. Is there anyone else you can think of that we should talk to?

..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....
..... **Position:**.....

Report Number 2

Annex 3

Recycling of plastic packaging waste - case studies of ICL and Gregham Plastics

- by A. Nielsen, Chemistry Department, Brunel University, Uxbridge, Summer '97.

Acknowledgement.

First of all I want to thank Sue Grimes, Course Director, Brunel University, who made this interesting project possible. Also my thanks to Gail Collins, ICL Putney, and George ... ICL Sevenage. Gail guided me through this project and did proofreading. George showed me around on the ICL Sorbus site in Sevenage and we did a few packaging samples. At last I like to thank Steven Charse, Gregham Plastics Plc, who took the time to show around and explain the art of recycling plastic despite summer rush because of summer vacations.

Anders B. Nielsen.

Introduction.

Packaging is a vital part of modern society today. The purpose of packaging is to protect goods and products from being damaged in their transit from the manufacture to the consumer. Packaging can consist of many different kinds of materials: paper and cardboard, wood, metal, glass and plastics. Packaging has changed in the past century. Before plastics were invented, most packaging consisted of wood, paper, glass and metal, but lower production-cost and ease of handling, plastic packaging provides, have revolutionised the packaging industry. The amount of waste has increased in the same period and waste management systems have in the past 20 years encouraged and facilitated waste reduction. There has really been little concerned or

thought given to packaging waste until today with new legislation in force. For most industries this legislation, demanding a certain part of the packaging waste to be recycled, was like a bombshell.

This report is about packaging waste from ICL, especially plastics packaging. ICL's main business functions is system integration of IT equipment. Electronic equipment is extremely sensitive and does not stand knocks or exposure to damp weather, so packaging plays an extremely important role. Also this report looks at ways to implement recycling and recovery schemes to meet the new legislation, and includes a case study from ICL and Gregham Plastics. The focus of the report is on plastic, one third of all plastics manufactured today are used in packaging.

About ICL.

ICL creates and sells information technology (IT) systems and provides IT related services. This means install hardware and software for businesses with large communication demands, like banks, post offices, retailers, airports, TV broadcasting companies, railways and other computer networks (local and global). ICL does not produce the hardware themselves but order it at electronics manufactures in the UK and abroad.

General about plastics.

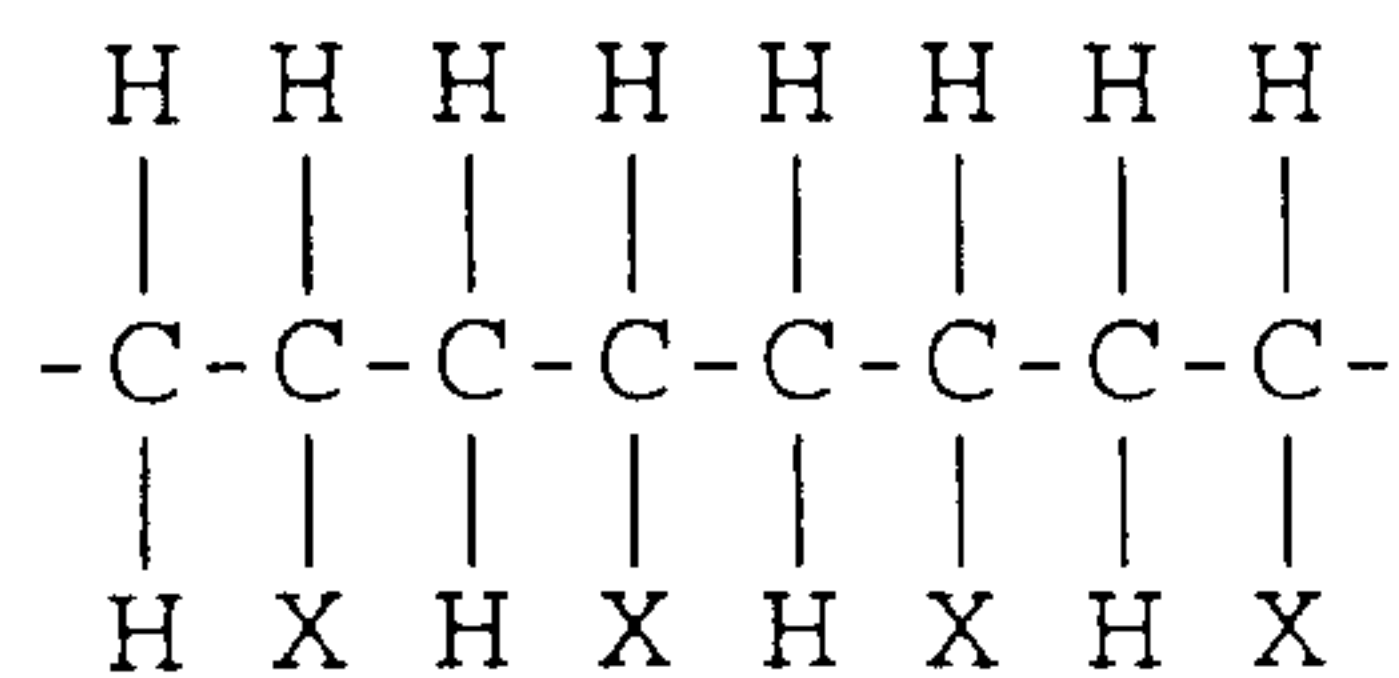
Plastics are made of polymers which are large organic molecules built by the repetition of small, simple chemical units. The length of the polymer chain can vary from 1,000 to 10,000 or more repeating units. The same kind of plastics can have "short" or long polymer chains, giving different physical characteristics and properties. Also processing and performance carteristics (eg. toughness, strength, solubility) change with average molecule weight. The polymers can

exist as single molecules or as molecular networks. Single molecules can either be linear or branched.

Figure: Single molecules, branches, networks.

Plastics made up of single-chain polymers are called thermoplastics as they melt on heating and solidify when cooled. Thermoplastics are the most interesting plastics in their relation to their recyclability. Non-thermoplastics (network polymers) cannot melt and therefore cannot be remanufactured as easily. Here only thermoplastics will be described.

The chemical composition of polymers can be as follow



where X represents a side group, either H or other substitute. Other chain formations occur, including branches. The six most common polymers are:

- polyethylene (two variations) or PE
- polyvinyl chloride or PVC
- polystyrene or PS
- polypropylene or PP
- polyethylene terephthalate or PET

Polyethylene is the simplest polymer. It is manufactured in two different densities, making both low-density (LD-PE) and high-density polyethylene (HD-PE). The density depends on the degree of branching, less branching results in a better molecule packing and high crystallinity. HD-PE is more rigid, stronger and has a higher softening temperature. HD-PE is used in milk, juice and water containers in order to take advantages of it excellent protective barrier properties. Its chemical resistance properties also make it well suited for items such as containers for household chemicals and detergents.

LD-PE offers clarity and flexibility. It is used to make bottles that require flexibility. To take advantages of its strength and toughness in film form, it is used to produce grocery bags and garbage bags, shrink and stretch film, and coating for milk cartons.

Table: Different thermoplastics.

The number of branches can be increased by adding butadiene $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$ to the mixture for the polymerisation process.

PP has properties similar to those of HD-PE which it competes with in some markets. It has high tensile strength, making it ideal for use in caps and lids that have been hot-filled with products designed to cool in bottles, including ketchup and syrup. It is also used for products that need to be incubated, such as yogurt.

PVC accepts a wide range of additives that makes it one of the most versatile plastics on the market today. PVC provides excellent clarity, puncture resistance and cling. As a film, it can breathe just the right amount, making it ideal for packaging fresh meats that require oxygen to ensure a bright red surface white maintaining an acceptable shelf life.

PS is a hard, transparent and brittle thermoplastic. It is being widely used because it is inexpensive, has low moisture absorption, is easily coloured and is easily mouldable. PS is manufactured in six general grades. In the context of packaging only the expanded grade is interesting in terms of packaging. PS granules impregnated with a blowing agent are used to make expanded polystyrene, EPS.

PET is used mainly for food and beverage packaging. It is a clear, tough polymer with exceptional gas and moisture barrier properties. PET's ability to contain carbon dioxide (carbonation) makes it ideal for use in soft drink bottles.

Most polymers are of little practical value by themselves. They are susceptible to heat and UV degradation and their physical properties are generally inadequate for specific applications. The additives transfer a polymer into plastic. The development of new additives contributes to the

processing and performance values of plastics. There are many different types of additives, each giving the plastics the properties that are needed.

Types of additives:

Property Modifiers: aid processing by improving impact and crack resistance, others reduce the melt viscosity resulting in faster production rates. Lubricants provide a release layer between the plastic and the mold.

Colours.

Plasticisers are used exclusively in PVC. This converts a hard, rigid polymer into a flexible soft one.

Antioxidant: as most polymers are susceptible to oxidation.

UV-stabilizers: as most polymers are sensitive to sunlight. UV degradation of plastics is manifested by yellowing, cracking and embrittlement.

Flame Retardants: modify the combustibility characteristics of plastics. Properties such as flame spread, ignition temperature and rate of burning can be controlled to some extent with flame retardants.

Fillers: play a double role in plastics. They are inexpensive extenders used to reduce and overall cost of the compound and as property modifiers, see above. There can be up to 10% fillers in plastics.

Reinforcements are used to improve such mechanical properties of plastics such as tensile strength, impact strength and heat distortion temperature.

What are they good for, and where do we use them?

Modern people are surrounded by plastics at home, at work, in the car, clothes. Almost every thinkable product can be manufactured in plastic. The features of plastic are that they are cheap and easy to manufacture. It's easy to form products from raw materials; plastics are light, resistant to moisture, chemicals and decay. Durability also plays a role. Plastic polymers are made from oil, natural gas, coal and salt. Plastic production only accounts for 4% of the world's total oil usage. The polymerisation process is now known in details and can be controlled by the usage of catalysts. As thermoplastics melt with raised temperature - and solidify by cooling - processing is easy by either extrusion or moulding. Plastics can be formed into complicated forms and shapes. The only lack of plastics is the strength is not high compared to other materials. Research is constantly finding new and stronger plastics. Composite materials where plastic is combined with other materials like glassfibers and carbonfibers are a whole new chapter in plastics, as composite plastic has the strength of steel. Another lack is the environmental burden. Most plastics are not bio degradable, so litter thrown in nature does not go away by itself.

PE is widely used to produce plasticbags and films. Minor uses are cable insulation, coating of cardboard, pipes for gas and water. Plastic bottles for various purposes can be made of PE, PP, PVC and PET.

PP has good clarity properties. It is used for films and lids for PE bottles.

PVC is the most widely used plastic. Film, toy, coated onto copper wire, floors, pipes.

PS is optically clear. It is used in furniture, hangers, foam for building insulation and shock absorbing packaging.

Packaging Functions.

Packaging has many functions. The most important is to protect the product from spoilage on the way and during its storage from manufacture to consumer. It must create a barrier between the

product and the hazards in the environment. These hazards can be kicks, knocks, shocks, vibrations, exposure to moisture and water or other gases and liquids. Packaging also protects products from light, dirt, insects and animals. Certain grades can protect the product against heat or cold. Other functions of packaging include ease of handling and stacking for storage and communication. Packaging is the communication link between the manufacture and the consumer. Self-service retailing means that the products have to sell themselves. Nobody can recommend it. The manufacture has to make the product stand out from others. The packaging has to present and sell the product. This may present a brand image and make the product more attractive by surface design and illustration and provide a medium for point of sale advertising. ICL's packaging does not have this function to sell. It is purely a practical protection function. Packaging has to describe and identify the product. Packaging should comply with all legal regulatory requirements while being environmentally responsibly. For instance there is legislation about packaging and labelling hazardous substances.

A single packaging material can seldom fulfill all the demands there are, so packaging of a certain product often contains more than one material. To take an example, a computer: First the computer is packed in a plastic bag, typically polyethylene, to prevent it from getting any scratches during further packing with EPS etc. Then it is packed in cardboard boxes that are easy to handle and to stack. To prevent damage of the computer due to drops and transport vibrations, a cushioning material is used. There are several examples of cushioning materials. Most often seen is EPS which is moulded in a form to fit exactly on corners, edges and other surfaces. Another way of using EPS is the bean or chip format. The space between the product to be protected by packaging and the cardboard box is simply filled with "beans" or "chips". When more irregular shaped items are packed, "airbubbleplastic" can be used. The product is wrapped in airbubbleplastic and packed in cardboard boxes. Further space in the box is filled with either EPS or more airbubbleplastic. Also crumpled newspaper or other paper can be used as a cushioning material. Polyurethane is also used to some extent, but this is not a thermoplastic. The cardboard box is closed with sticky tape (made of plastic), and because the cardboard box does not withstand wet weather, it is wrapped in plastic film, typically polyethylene. Labels on the cardboard box and the wrapping film, detail the contents. Then the boxes are stacked on a pallet and wrapped with more plastic film. Labels detail the receiver.

Waste management.

As a part of good waste management practice a waste hierarchy has been set up.

Reduction

Reuse

Recycling

Recovery

Disposal

Modern waste management is built on the situation today. The largest concern is the growing mountain of waste we produce, we will literally drown in waste if we don't react right now! Where do we put our waste? In addition there is the depletion of fossil fuels and other raw materials to consider. It has been predicted that the traditional energy resources will only last for another 50-100 years if we continue in the same speed and do not introduce alternative energy sources.

Reduction of waste (waste minimisation).

There are two issues of packaging waste reduction. Reduction of packaging material and product protection. Many consumers talk about over packing, and in some cases it is true, but remember that packaging does cost money, ie it is an expense for the company to pack their products. The packaging industry has reduced the amount of packaging materials needed for protection on a continuing basis in response to competitive economic and technological influences. The development of new materials and technologies together with innovative design will ensure that packaging will continue to make significant contributions to today society. At the same time the

development has created technics which have minimal effects on the environment (ie harmful air emissions, toxic metals etc.). Should the packaging pose a risk of releasing potentially toxic byproducts during manufacturing, use, reuse, recycling, disposal or incineration (ie heavy metals in ink, toxic solvents, harmful air emissions etc.) it should be given priority for elimination, substitution or reduction, but great care must be taken, that changes do not pose a greater risk in other steps of the packaging's lifetime. Where packing cause an inconvenience to the consumer, it certainly causes an inconvenience to the producer. Most companies have already tried to save money by optimising their packaging. To optimise packaging means to find the cheapest package that still protect the product satisfactorily. This can be done by changing the packaging design and choosing the right packaging materials. Cushioning materials of EPS can be designed to have a form so the cushion is where it is needed only, and not where the risk of product damage is small, eg the sides. Also "holes" can be built in EPS formed cushions so less EPS is used to protect the same product. Another example is milk bottles. Milk bottles of glass are only half the weight today compared to milk bottles 50 years ago, by changing design and techniques at the stage of bottle production. By choosing the right packaging material, many tonnes of waste can be avoided. A bottle made of plastic weighs quite a lot less than a bottle of glass with the same volume. But opposite, sufficient packaging actually reduce the amount of waste created! The amounts of goods that are damaged during transportation when it is properly packed are only a few percent. If goods were less thoroughly packed, more goods would be damaged, and it maybe not possible to save/repair them. It is estimated that 50% of all food in developing countries is lost due to the wrong or insufficient packaging and storage, and 10-20% of hardware is damaged when it reaches the consumer. A good thing about plastics compared to other packaging materials is that it is light weight. Firstly this is because of health and safety at work with issues of heavy lifting, second it's more expensive to transport more heavy things (ie use more petrol/diesel), and finally this combustion process increases air pollution and contributes to the greenhouse effect.

Reuse of packaging is seen more and more often, and it makes good economic sense too. The only disadvantage reuse has, is the transportation of the empty packaging. It's not really a problem, just a change in the daily routine. As the lorry delivers the goods in either cardboard boxes or big plastic containers, the materials for reuse can just be returned with the lorry, it's going empty or half empty anyway. The optimum solution would be to reuse all packaging, ie

implement new systems. Instead of cardboard boxes, then have big plastic containers with a lid where the products fit into. Some shops selling clothes have this system already as clothes are delicate products that dirty easily. Also supermarkets have this system for bread, fruit/vegetables, fresh meat and milk. The plastic boxes are returned to the manufacture who fills them again. This system works only when it's the same kind/size of products that are delivered again and again. If the product changes all the time, this system is not good. Alternatively the cushioning material can be reused - returned to the manufacture that use them again. Films are a little difficult to reuse as they often break when unwrapping. The biggest problem regarding reuse of packaging is probably storage space for materials for reuse, but again in the design phase, things can be made to stack. Another example of reuse of packaging is beverage bottles in Denmark. When buying soft drinks or beer in either plastic or glass bottles (cans are banned) one pays a deposit (between 10-50 p per bottle) which is returned when one brings the bottles back to the shop. The bottles are then sent back to the brewery where they are washed and refilled (including plastic bottles). Other bottles - delivered to the bottle banks - are taken to a central collecting point where they are sorted after type and washed and reused.

The third best method is recycling. Recycling is to remanufacture new products of old products, while recovery means energy recovery by combustion (or composting for non-plastic materials). As explained earlier recycling of plastics can be difficult, or rather the segregation can be difficult as there are so many different types of plastic and most plastics cannot be recycled if they are mixed or contaminated in any way. In other words the material plastic mixture must be homogeneous. Multiple reprocessing of thermoplastic polymers cause changes in the physical and chemical structure and hence changes in the performance or the articles which are manufactured. Technical developments continue to develop but the scientific view is that these changes are irreversible and perhaps cannot be eliminated. This means that for many applications there will be a limit on the percentage of recycled polymer that can be accommodated. Also the use of recycled plastics in applications that comes into direct or close contact with foodstuffs is avoided. Recycling of other packaging materials like cardboard, glass and metals are more straightforward and recycling schemes have been set up, so a large percentage of these materials are now recycled. Examples of materials recycled are glass, newspapers and aluminium cans to bottle banks. In Sweden is there a deposit on aluminium cans for beverage drinks. When the

empty cans are returned to the shop, a machine crushes the cans together and the deposit is refunded.

Recovery/incineration with energy recovery of plastic packaging waste is probably the best solution if the waste is very mixed or contaminated. In fact some plastics have almost the same calorific value as coal and oil which is otherwise used for power/energy production. But remember, that because of the limited number of waste incineration plants that all run by maximum capacity, incineration of packaging waste means that other rubbish must be disposed off by other means, this means landfill. To recover a larger part of the energy in rubbish, more incineration plants must be built! In the UK, the incineration levels are low relative to other European countries. New plants are being planned but there are difficulties with space for their development and Not-In-My-Backyard Principle. There has been some concern of incineration of PVC, as it contains chlorine. By incineration the chlorine will be realised as hydrogen chloride, which contributes to acid rain. But new and modern incinerators are built with smoke cleaners as standard (wet or dry scrubbers with activated carbon), and these should eliminate the amounts of acid emissions. Furthermore PVC has been claimed to contribute to formation of dioxins and difurans. The chlorine content of municipal solid waste typically comes from PVC, paper which is bleached with chlorine and cooking salt. Experiments have shown that the amounts of dioxins and difurans only changed slightly by sorting off all PVC from the waste before incineration. Modern smoke cleaners are able to eliminate the dioxins and difurans considerably.

Landfill is the least preferred option in the waste hierarchy. However, seen from a landfill site's managers eyes, plastic waste is very suitable for landfill. Plastics are inert, non-bio degradable and nonpoisonous. It means that there are no problems regarding leachate and landfill gas. Because plastics are non-bio degradable it unfortunately stays as litter at unwanted places, such as nature. In the past, experiments have been done to create a bio degradable plastics, and it is possible to produce. But producers are careful about producing this plastic as it is not suitable for recycling. Plastics can be made bio degradable by adding starch to the polymer, but because of the starch, the plastics have an unpredictably of lifespan. The plastic that hold a four or six pack of beverage cans together is made of bio degradable plastic which degrade after six weeks in the sun.

Recycling.

A package or packaging material is considered to be recyclable if there are widely available or economically viable collection, processing and marketing systems in place. When considering recycling, care must be taken that collection, transportation and reprocessing do not use more energy than disposal of the packaging waste by other means. This means there must be an overall saving in energy, everything included, otherwise recycling is not the best option environmentally. When designing packaging one must bear in mind that the recyclability of the packaging waste should be recyclable to the maximum.

Primary, secondary and tertiary recycling.

Primary or closed loop recycling is where the material is recycled into its original material or container form and it is the most economical and preferred option, provided all health and other regulatory requirements are fully met. Recycling into a different package form - secondary recycling - is also a desirable option. Tertiary recycling is recycling into a product other than a package or packaging material. This may be the only available option for some materials.

Plastic packaging.

Plastics are a versatile family of materials that are suitable for a wide range of packaging applications. In many cases plastic offers the best protection whilst using minimal resources and creating less waste than alternative materials. In fact 400% more material by weight would be needed to make packaging if there were no plastics, while the volume of packaging would more

than double. Plastics are strong yet lightweight, meaning it often requires less plastic to make a certain package compared to other possible materials. Plastics have relatively long lifespan. Their physical properties allow them to be used in multiple applications, whilst their durability and flexibility allow them to be used again and again. Plastics generally exhibit superior resistance to breakage and denting. Plastics allow highly efficient manufacturing processes (up to 99% efficiency) that increase productivity by 20-30% and reduce capital expenditures by as much as 50%. One of plastic's most unique properties is its durability. This durability makes it one of the materials of choice for commonly reused items.

Plastic packaging recycling at ICL, where to start?

Successful recovery of plastics - like any material - requires an infrastructure that can get plastics from the consumer and back into use as new products. The plastic recycling infrastructure has four parts: collection, handling, reclamation and end-use.

Collection: Is described later.

Handling: Plastics from collection programs are sorted to increase their value and compacted to reduce shipping costs.

Reclamation: In conventional recycling, sorted plastics are chopped, washed and converted into flakes or pellets that are processed into new products. Advanced recycling technologies can take mixed plastics back to their original building blocks (monomers or petroleum feedstock). These can then be recycled into a number of different products, including new plastics. Advanced recycling technics are on an experimental level and not described further here.

End-use: Reclaimed plastic pellets of flakes are used to manufacture new products.

Each of the six common packaging plastics has performance characteristics that make it best

suited for specific applications. Purchasers of recycled plastics want to be sure that these properties are retained, to obtain the highest market value and best performance quality. Processing of mixed plastic types can result in a product that has inferior physical properties including strength and durability. With proper quality controls recycled plastics perform as well as virgin plastics. The variety of products made with recycled plastics are growing, some examples are:

PET: soft drink and juice bottles, deli and bakery trays, carpets, clothing and textiles.

HD-PE: bottles for laundry products, recycling bins, agricultural pipe, bags, motor oil bottles, decking and marine pilings.

PVC: fencing, pipe, non-food bottles.

LD-PE: bags, carpets, battery casings, textiles, industrial fibres, films.

PS: office accessories, video cassettes and cases, insulation board.

Collection.

Collection of plastic packaging for recycling is inhibited by the need to separate plastics by type, contamination, high collection costs due to low material density, insufficient and variable volume of recyclable material, the use of different plastics in a single package, unidentifiable materials and unestablished markets.

High quality plastic recycling.

To be effective and ensure a high quality end-product the different members of the plastic recycling infrastructure need to work together. If manufactures are going to produce high-quality recycled products, then their feedstock must be of high quality too. By working closely with end-markets, understanding the materials they collect, designing systems to identify and remove

contamination, educating the people who do the job, all help make sure that recyclables are used to manufacture high quality goods. Quality control is also important because it affects the bottom line. If collectors and material handlers can consistently provide good quality materials to their markets, they will receive better prices and avoid downgrades, both of which will help sustain recycling programmes over time. Improving material quality not only makes good recycling sense, it also makes good economic sense.

How ICL prepares their plastic material for recycling depends on the type of market to use. Preparation and separation requirements are typically more stringent with reclaimers than handlers. Accordingly, prices paid by reclaimers are typically higher than those paid by handlers. ICL has a great opportunity to handle their plastic packaging waste themselves, as it is in large quantities and not too many different types of plastic. It's also important to be flexible, markets change, demands change and technologies change. Maybe the packaging waste can be increased in value by changes and technical adoption? Understanding the problems that can occur when different plastic types are mixed together is an important step towards quality control on the educational level. By knowing how their actions can affect the quality and marketability of the material collected, it encourages the employers to segregate the plastic waste correctly. Also economical insight of recycling programs and businesses encourage employers to act responsibly. ICL is considering handling their plastic packaging waste themselves and delivering directly to the reclamator.

Packaging legislation/packaging waste legislation.

The overall target for waste management is to reduce the huge amounts of waste created by man. Of the total of 2,200 millions tonnes of waste arising from all sources in the UK, the 50 million tonnes are packaging waste. It does not sound of much, but packaging waste is relative clean and easy to reuse or recycle. The plastic content in municipal solid waste is 7% by weight and 18% by volume. Currently about 18% of the packaging waste in the EU is recycled, but it varies very much from country to country, some countries have already achieved the European target for year 2001. A EU Directive on Packaging and Packaging Waste (96/62/EC) was adopted in

December 1994 and came in force on 31 December 1994. It applies to all waste, packaging, household, commercial and industrial - and had to be implemented by 30 June 1996. A principal aim of the Directive is to harmonise the recovery and recycling targets to be achieved by the Member States to ensure no barriers to trade and at the same time to achieve a high level of environmental protection. Within five years of coming in force a target of 50-65% recovery of packaging materials in waste should be met and a target of 25-45% recycled with a minimum of 15% of each material. The directive is to be implemented in the UK through regulations.

The environmental Act 1995, sections 93-95 (which came into force on 21 September 1995) relate to producer responsibility for packaging and packaging waste. The regulations apply to all businesses involved in the packaging chain and which handle more than 50 tonnes of packaging material and/or packaging in a year, and have a turnover of more than £5 million. From year 2000 businesses with an annual turnover of more than £1m will also be subject to the regulations. Compliance schemes and individual businesses must register with the Environment Agency and pay the annual fee.

A business may choose to become a member of a compliance scheme. These schemes are then responsible for meeting the recovery and recycling targets of its members. Scheme members are likely to be charged a membership fee and will be required to provide the scheme with packaging data. Alternatively a business may choose to take on the obligations of meeting the targets on its own. The Environment Agency has made a registration pack that can be obtained at the Agency for free. It contains a computer disc with a program which does the calculations. Businesses must registry with the Agency before 31 August 1997.

The legislation which translates the EU Directive into UK law is set out in the Producer Responsibility Obligations (Packaging Waste) Regulations 1997. These came into force in January 1997. The packaging chain consists of businesses that

	activity obligation
- manufacture the raw material for packaging	6%
- convert the rawmaterial into packaging	11%
- pack of fill packaging	36%
- sell packaging	47%

It is estimated that 11,000 businesses will be affected, ie 6% of the total amount. However, these businesses produce 90% of the packaging waste.

Each category of business above has to contribute to the recycling and recovery targets. The level of contribution “activity obligation” is different according to where a business is along in the packaging chain. ICL is involved in “pack or fill packaging” and “sell packaging” and has therefore more than one activity obligation. The activity obligations are as shown above.

Producer responsibility makes packaging waste producer’s take a share of responsibility for dealing with product waste. The obligation affects raw material suppliers, manufactures, processors, whole salers and retailers. They correct market imperfection for household waste and create incentive to minimise and reconsider product design. Further it promotes sustainability (resource conservation) and participation.

Design.

Materials and processes. Today much packaging is designed with the use of Computer Aided Design (CAD). This can provide an aid to getting the weight at the optimum level, keeping surface areas to a minimum. If compatibility and aesthetics permits, then use of lightweight materials such as plastics. Computer simulation of pallet layouts will often reveal scope for big improvements in pallet utilisation which will significantly reduce transportation and storage impact, particular of energy consumption. Packaging as a protective for sensitive products is often state of the art, for example that of ICLs.

Lightweight containers. Packaging design has a very big impact. For example, avoiding sharp corners means less outer protection for fragile items, or better material distribution and lower weights for plastic and glass bottles.

Investment. Investments provide an ideal opportunity to make environmental improvements: Shrinkwrapping with film to replace boxes, on-line printing to replace labels, bulk handling systems to reduce transit packaging etc. All these improvements invariably provide financial savings as well as environmental improvements.

Management: Transport Testing is a must before any major changes are made to lightweight packaging or reduce protective packaging. But often experimentation will reveal scope for material reductions. Normally, suppliers of packaging are very cooperative in helping to select the right specification to minimise material consumption, or advise where recycled materials would be a possibility.

Consumer Testing/Acceptance is clearly a necessary, but all too often it is overlooked. This of course is not necessary for companies like ICL. Don't get too carried away with a change unless you are sure your clients or consumers will be satisfied with the result.

Packaging.

Packaging is a delivery system composed of the following elements:

- Primary packaging: consumer units in direct contact with the product, eg bottles.
- Secondary unit: trade unit transported to distribution centres and individual stores, eg corrugated case.
- Tertiary packaging; palletised load of secondary units.

What is often not appreciated is that changes in one aspect influence the others and therefore a total systems approach is required when designing the package. Packaging must satisfy, contain, protect, preserve, inform, run down conveyer lines, pose minimal environmental impact, provide consumer convenience/utility and satisfy all legal requirements. Packaging must also appeal to the end user and in addition, be of a format which is suitable to retailers.

Returnable Transit Packaging.

The cost-effectiveness will in general be a prerequisite before any change from use of one packaging to adoption of a returnable system will occur. The driving force are environmental benefits and waste reduction. One of the key factors when comparing returnable and nonreturnable systems is the transport distances between manufacturer and retailer and the number of lorries required to move filled and empty units. It's clear that when transport of goods is over large distances, returnable distribution systems are not practical. In addition the logistical systems are not in place and the costs are likely to be prohibitive. The following criteria have to be met before implementation of returnable transit packaging:

- ecologically sensible
- international compatible and usable
- accepted by the whole of the Trade
- at least cost neutral to current system.

Packaging ensures that products can be safely and efficiently distributed throughout the supply chain.

Business costs. Whilst legislative changes require industry to initially bear responsibility for the recovery of packaging from the waste stream, economic pressures are simultaneously forcing industry practitioners to optimise resource use. In addition to industry wide economic pressures, the packaging industry is facing increased costs:

- raw material costs are increasing ahead of the rate of inflation
- the cost of financing schemes to meet the EU targets for recovery of packaging waste
- the implementation of landfill tax, up to £7 per tonne to encourage use of alternative practical waste management options.

By reducing the quantities of packaging produced, businesses will be able to minimise these

additional costs and improve overall business performance.

Consumer attitudes.

Growing consumer awareness of environmental issues has focused attention on levels of packaging resource use and post-consumer “waste”. This now plays a significant role in product choice. Together with other environmentally driven changes (the move towards sustainable production techniques and the emergence of a cleaner consumption pattern) this has created new dimensions for packaging specifications:

- 80% of consumers are either quite or very concerned about the environment
- 63% of consumers would like to be able to do more to help the environment, of which 27% would like to do more recycling
- 63% of consumers state that the type of packaging affects their choice of products
- when prompted, 66% of consumers feel that products are over packaged.

Source reduction.

Reduction of the quantities of raw material leads to reduction in energy consumption. Distribution, storage and disposal requirements are also minimised. Life Cycle Assessment continues to be developed, to help assess the cost and environmental impact of design changes. Quantifying the impacts of such changes throughout the whole product life cycle is essential, for whilst there may be obvious benefits, there may also be less obvious drawbacks. Opportunities for packaging source reduction exist through:

- product redesign, packaging redesign, implementation of technology (eg lightweight material, recycled material)
- optimisation of transit packaging (use of shrink wrapped trays in place of cardboard cases), use

of returnable packaging where appropriate.

Whilst the business can benefit from more efficient operating systems and reduced raw material requirements, the consumer (whether he is the manufacturer, the retailer or the end-user of the product) can benefit from the opportunity to purchase products with reduced environmental impacts and potential cost savings.

Business.

Valpak estimates that the cost of complying with the regulations could range from £2000 - £3000 per year for a small company to about £8m per year for a larger business.

EPS consumption in UK is 40,000 tonnes per year, just over half goes into packaging of white and brown goods, electronic equipment, horticultural products and fish. In 1993 2500 tonnes (12%) of post-consumer EPS packaging was recycled. This figure was expected to reach 3700 tonnes (17%) by year 1994. Most of the recycled material goes into non-packaging applications such as cassette cases and hardwood replacements. EPS packaging consumption is estimated to be of 37,000 tonnes in 2010. Recovery rate could reach in excess of 50% by 2010, of which about 2/3 could be mechanically recycled and the remainder incinerated. Market forces are working in favour of recycling. Prices for virgin PS, about £800 per tonnes in 1993 are raising. In contrast, the price for recycled EPS is around £400-450 per tonnes, offering significant scope for substitution of virgin material. The potential market for EPS recyclate is large. The main outlet is in non-foam PS applications, which was about 200,000 tonnes per year in 1993. Post-consumer EPS packaging can also be blended in as a partial direct substitute for virgin polymer. The leading TV and video rental business Granada is saving at least £40,000 per year in landfill costs by collecting more than 85 tonnes annually from its stores and customers. The material is transported in delivery vehicles returning to its central distribution depot where it is compacted and passed on to a recycler, Flopak. Granada is also collecting used EPS packaging from other businesses to maximise the benefits of the scheme.

Plastic Films Recycling.

Plastic films are amongst the easiest materials to recycle, and this will often be the most appropriate option. But films are extremely lightweight. One tonne of plastic can produce as much as 75,000 m² films. This makes the use of plastic films a very effective method of employing valuable resources, but it also means that a large quantity of such films is needed to justify the cost and energy involved in the collection, balling and transport of film waste for recycling.

Practical plastic collection.

When starting up recycling schemes it's very important that everybody knows what is going on and why! Nobody can recycle correctly if they don't know how to do it. In the beginning of a recycling scheme it's very important to monitor it closely so segregation mistakes can be corrected right away and don't develop to a bad habit. Typical mistakes are:

- now we recycle plastic, this means all plastic in one bin and all other waste in another, or
- EPS-foam in one bin, plastic films in another and all other plastic scrap in a third bin.

All this is wrong segregation. It should be: PS-plastic in one bin, no matter what form (foam and non-foam) it is, PE in another bin, no matter in what form it is (film and non-film), PVC in a third bin etc. But there are more dangers such as sources of contamination. One employee has a piece of plastic film but do not know what kind of plastic it is, OK, he just put it in a random bin whilst nobody is looking or, somebody forgot to take the labels off the plastic wrapping before binning. The first day or so when recycling it is probably a good idea that somebody who knows how to do recycling actually stands next to the bin and explain the staff how to do it. When compacting the plastic waste into bales, the compactor should be clean and also the storage area, remember that we are actually dealing with a raw material. The best option is it to store the

bales inside, but if there is no space available then store it outside on a pallet covered with a plastic bag, preferable black as sunlight can degrade polymers. In the beginning the employers probably find it interesting and maybe even funny to recycle the plastic waste, but as time goes there may be some lack in how energetic the employees are, it becomes everyday work, and mistakes in segregation happens more and more often. Again it's important to tell the employers how important it is to recycle. An idea is to show on a poster in the canteen or in smoking room, how much plastic is recycled till today, and how much money is saved! Also write about the scheme in the company newsletter and the local newspaper. When starting up it's a good idea to start recycling one kind of plastic only for some months. Maybe the recycler, the staff or costumers have some changes to make it better or more convenient. Eg bins are placed the wrong place or in the wrong height, the daily routine does not work or there is a fire hazard. The recycler may find something wrong with the recyclables and the segregation procedures has to change. Then after a couple of months slowly make the recycling scheme include more kinds of plastic if necessarily and practical.

Signs are important. Big signs on top of each bin saying what kind of plastic belongs to it. Make sure not to swop the signs as some people might not see it. A practical thing to avoid unnecessarily contamination is to place a normal litterbin next to the recycling bins, so the guy who just blow his nose hopefully put his napkin in the litter bin and not the bin for recyclables! Make sure that new staff are properly instructed and that bad habits don't spread.

Remember the producer obligations do not ask you to recycle all you plastic packaging waste, but if you have other plastic waste, then ask your recycler if you can mix non-packaging and packaging plastic waste (provide it's sorted, of course).

The main reason why there are so many misunderstandings regarding plastic recycling is that there are so many different types of plastic. So if the number of different plastics circulating in a company could be brought down, things would be much easier, of course it's not too easy to substitute one kind of plastic with another, as they have different properties, and a substitution would probably be more expensive, as the cheapest form of packaging is already chosen to cut down expenses. Imagine if it was technically possible to substitute PE-film with PS-film. Then

PS-film and EPS could just be recycled into the same bin!

Business pressures.

To create a market for a new product it's important that there are buyers and that the prices are sufficient low. The quality of the products must be similar to the ones already on the market. In the case of recycled plastic products the same appear as in all other businesses: the more there are sold, the cheaper it is to produce a product (per item), but also the more expensive rawmaterials (supply and demand)! With the new producer obligations it is predictable that prices on plastic waste will drop dramatically as the market will be flooded in recycled plastics. It is very important to make the whole idea of recycling work, that buyers actually go and choose the recycled products instead of the similar traditional product of virgin plastic. So the first thing ICL should do, is to switch to recycled packaging - plastic, cardboard boxes - all packaging. It looks stupid to recycle own waste and buy new virgin products and not recycled products. It is all linked together. The next thing a large manufacture as ICL can do, is to ask suppliers to pack goods in a certain way: in recycled plastic, cardboard boxes etc. if there is a contract or ICL buy in large quantities a certain pressure can be set on the suppliers. They might charge a little extra for the package, but ICL has made sure that there is a market for recyclables. Do not do the same mistake as in Germany when the tough recycling demands came in force some years ago. There were mountains of recycled plastic, but nobody to buy it. That is not a good environmental solution.

Packaging at ICL.

ICL does many different things. Integrate computers and other electronic things, sell and install and deliver/repair spare parts. So basically goods are delivered from suppliers then unpacked and repacked at ICL and delivered to wholesaler/end-user. Goods come in cardboard boxes on pallets

wrapped with plastic film. When unpacked all the packaging waste is transferred into big trollies. Then “cleaners” take further care of the waste. Present some cardboard are already being recycled. Either if it’s neatly undamaged boxes, they are opened in both ends and neatly folded together and then stacked neatly in a closed skib, or if the boxes are damaged or of irregular shape, they are feed into a machine that granulate the cardboard to small pieces (5x5 cm²). The granulate are collected in big black sacks and transported on pallets. The rest of the cardboard and all other waste are disposed off in some large skibs. A waste sample of the skib showed that much cardboard is still disposed off this way. The main reason for this is that some boxes contain EPS or other cushioning materials in larger or smaller pieces. The cardboard granulator cannot be fed with EPS as the cardboard for recycling is contaminated then. And second if the EPS is taken out of the boxes it will fly around in the hall when gates are open because of its light weight. After the sales men have installed new hardware in for instance a shop, they take the empty packaging back to ICL. That is a very good service for the costumer. The salesmen unload their vans for empty packaging. If there are any cleaners around, they will deal with the waste further, eg recycle cardboard and so. But if not - if the weather is bad and the gate is closed, then the drivers will throw the waste into the skip. A waste sample showed that there are cardboard in the waste most of all, next is plastics in the following order: PE-films (wrapping film and bubbleplast), EPS, polyurethane. Also it contains paper and michilinius. A rough guess is that 75% of the skips content can be recycled if the facilities are in place. The pallets that the goods are delivered on are reused if their conditions are all right. If they are broken, they are disposed off. ICL has a skib for old pallets only.

Other recycling schemes that are already in operation at ICL, are recycling of white office paper and aluminium beverage cans.

Usage of packaging at ICL.

When ICL is sending spare parts off, they are packed in cardboard boxes. In general each spare part is packed individually at the manufacture, so if a costumer needs two or more spare parts

they are packed as they came from the manufacture, into a cardboard box. The void space in the box is filled with crumpled paper. The boxes are stacked on pallets and wrapped with film. A label is attached on the film saying the content and receiver as well as papers for customs. ICL is planing to switch to another cushioning material that is cheaper. The new material is fill air bags made of PE. In addition the new material is also more lightweight (99% air).

Recommendations to ICL to fulfill the producer obligations.

- card
 - try to recycle as much cardboard as possible, if possible collect all EPS in plastic bags before disposal so it doesn't fly around.
 - spare parts out of house: is it necessarily to double pack spare parts? Can spare parts be shipped as single items in the original package?
 - ICL has already made experiments with plastic boxes for reuse when deliver spare parts for their costumers. Expand this service and save cardboard boxes.
 - will a cheaper and thinner box do for packaging of spare parts out of house?
 - Reuse the boxes that are neatly stacked for recycling. A new label can tell that ICL reuse the boxes.
- pallets
 - repair old and broken pallets, often they only need a nail or two. Take spare parts from other old pallets.
- white office paper
 - make sure there are recycle bins in all offices and near all photocopy machines/printers, preferably a bin for white office paper at every disk.
- cans
 - also place recyclingbins for cans in offices and in smoking areas.
- plastic packaging waste
 - there are two options: either recycle PE-film which account for the largest amount of plastic packaging waste or recycle EPS which is easiest to recycle. No matter what option ICL chooses there will be some capital cost as a compactor is needed to bale the plastic in both

cases. EPS can be compacted to 1/40 of its original volume, and a compactor will also squeeze all the air out of pallet wrapping film and bubbleplasts. Compacting reduces the transportation costs from ICL to recycler.

To start with the last: EPS is easiest to recycle because it is easy to recognise and it's only available in one form! Furthermore EPS is normally not contaminated with colours, labels or tape. EPS can however be a part of composite material, where it's typically glued to a board of card and then put into a box. If the EPS can be broken off the cardboard it's OK to recycle, but make sure that no pieces of cardboard are attached to the EPS. If so, dispose off right away. To avoid misunderstandings with composite materials, don't attempt to recycle them at all!

Because PE-film account for the largest amount of plastic packaging waste, a higher recycling percentage can be achieved by recycling this material. It is more difficult to achieve high quality recyclables as labels and tape contaminate the plastic. Further there are different colours of PE-films, ranging from clear to blue, pink and black. Plastic films can be made of other materials also (eg PVC), not only PE. A trained person is able to distinguish between different films by watching and feeling them. A coding system has been developed to help identification of plastic materials commonly used in packaging.

Figure of recycling symbols.

Unfortunately still not all plastics are coded. Through most packaging film at ICL are made of PE, special packaging can be made of other plastic. Do only recycle plastic you know what is, if you are in doubt about a certain piece of plastic is of PE or not: do not recycle it! Do only recycle large pieces of plastics such as the wrapping around the pallets and the bubble plastic. Don't bother about small plastic bags and other small plastic items laying on the floor as the risk they will contaminate the whole load is too big. ICL should make contact to a recycler before any recycling schemes are implemented. Ask the appropriate recycler about coloured plastics mixed together, ask about HD-PE and LD-PE mixed together, does he accept it?

The reason why not start recycling schemes for both EPS and PE-film together is mainly because of confusion at the cleaners, second it is good business to have something to deal with.

Environmental management systems.

Plastic packaging recycling is only a small part of a much bigger issue: environmental management systems (EMS). If a company choose to implement an EMS this means that they commit themselves to think and act “green” and actively approach a more environmental sustainable business. EMS contains issues like emission and discharges to air, land and water as well as energy usage. The target is to minimise all these factors. A company can choose to create its own EMS or adopt one like BS 7750 or ISO 14001. EMS works in the following way: The company write an environmental policy. On basis of this, a plan is formulated and the objectives and targets are set for individual emissions and discharges. The plan is implemented. It’s important that the staff receive the necessarily training. The implementation is monitored for documentation and records. If necessarily, corrective action takes place. The features of EMS are that an environmental audit must be carried out regularly (at least once every three years) and at last management review is carried out so changes and improvements can be implemented. All this is to make sure that companies

- comply with environment legislation and regulations
- products or services are produced, delivered and disposed of in an environmental friendly manner - and thus any adverse effects on the environment are minimised
- expenditure on environmental protection is timely and effective and that planning for future investment and growth reflect market needs on the environment.

Compliance schemes (Valpak).

The largest advantage by joining a compliance scheme such as Valpak is that Valpak free one from the risk of prosecution for noncompliance as ones legal obligations will be passed to a registered compliance scheme. The whole idea of compliance schemes is that such a scheme can gain benefits from recyclers from negotiating competitive contracts on behalf of a large aggregated obligation. These negotiating means lower recovery costs than most companies can achieve in isolation. Valpak is created by more than 200 supporter companies with the encouragement of the Department of Environment. These have included many specialists from all stages of the packaging chain. It is a non-for-profit organisation and is expected to be the first and largest scheme in operation, providing nationwide compliance for all packaging materials. They are targeting a mass membership and expect to be attractive to large and small businesses in all sectors. Further Valpak will offer their members technical advice and support in areas such as increasing use of recycleate and segregation and recovery of waste. The fee for joining Valpak consist of a once only payment on a scale related to turnover and date of joining plus annual materials levies from 1998. The one time joining fee is designed to attract early membership.

Table 1 page 6 in Valpakleaflet and page 11 in leaflet.

EPS.

Manufacturers of EPS will probably claim that EPS is the best packaging material in the world. And indeed it is one of the most versatile and cost effective cushioning packaging materials available. EPS is made of up to 95% air. The production process uses pentane as the expansion agent. Former some EPS was expanded with freons which damage the ozone layer in the atmosphere, but this is phased out. Pentane does not contain any halogens and does not damage the earth's protective ozone layer. However, pentane is a greenhouse gas and contributes to the greenhouse effect. Pentane is oxidised in the atmosphere to CO₂ and water vapour.

EPS is being successfully and profitably recycled throughout the UK. The proportion of used EPS packaging that is recovered, mainly through mechanical recycling, which has more than

doubled in the past two years. The UK is now recycling 28% of the moulded EPS packaging made here, the equivalent of 6,000 tonnes annually. This growth is due to advances in technology, enabling recyclers to handle “contaminated” EPS material such as fish boxes or horticultural trays. Forecasts show that recycling of EPS will continue to grow, reaching 35-40% by year 2010. There is a great demand for large quantities of used EPS packaging by recyclers throughout the UK. The collected material is recycled in three main applications:

- Remoulding into EPS foam. Post-consumer packaging can be granulated and blended with virgin EPS foam beads to make new EPS mouldings. It can also be blended with virgin crystal PS and regassed to make EPS loosefill packaging. New “peanuts” can contain anything from 25 to 100% recycled EPS.
- Reuse in non-foam applications such as plastic stationery products like video and CD cases, coathangers and plant pots.
- Reuse in extruded EPS applications to make for instance hardwood replacement. Can be used to make products such as garden furniture, windows and picture frames.

After EPS is compacted at the site, the recycler will collect the compacted material once there is a full load ready. This is taken back to the recyclers factory. The recycler feeds the compacted block of EPS into a granulator which chops the material into smaller pieces. The material is passed into a blender for through mixing with similar granules. And at last the material is fed into the extruder where it is melted. Colour is added and the extruded material is then moulded into its new shape.

Plastic films.

PE and PP comprise 90% of plastic used in film production in the UK. Recovery for recycling of other film material may be possible, but will not be significant in the overall volume. 331,000 tonnes of the PE packaging films go annually to non-domestic end uses. By the end of 1991 134,000 tonnes of this film was recycled equal to 40%. Films are already collected for recycling

directly major users in industry, retailers and farms. The first stage of the recycling process is a washcycle. The cost of cleaning (per kg of film) rises in the reverse proportion to the film gauge. For thin (below 35 μm) contaminated film, the cost of collection and cleaning alone can be more than the cost of virgin granules. Anti-static and conductive materials make up a relatively small portion of packaging products in film, bubble wrap, bags and foams. It is important to segregate these products from non-treated plastics when designing packages for recycling. Although many of the anti-stat additives are water soluble and will wash out during the recycle process, there are others that will not. These may mix with untreated plastics and contaminate them. Typical applications for recycled polyethylene are: base cups for PET bottles, refuse bins, flower pots, piping, traffic cones, plastic lumber, bin-liners, black sacks and carrier bags.

Plastic recycling processes.

Basically all kind of thermoplastics are made and recycled the same way. Virgin PE can be produced in four different ways. One way polymerization takes place is under high pressure (1000-3000 atm) at temperatures of 80-300°C. Free radical initiators are used in the reaction. Because the reaction is highly exothermic, a high cooling surface to reactant volume is required. Typically 10-30% of the reactant ethylene is converted to the polymer. Gas and polymer are then separated and the polymer is pelletized. This high-pressure process is used to manufacture LD-PE which is used in films.

The raw-material manufacture sells the plastic pellets to the product manufacture. Plastic products are produced by numerous processes of which extrusion is the most popular. The products can be diverted into two groups packaging and non-packaging applications. The former group - packaging - can further be diverted into consumer (packaging that are taken to domestic homes) and transit packaging. Of these product groups it is easiest to recycle transit packaging, but also rigid containers ie plastic bottles for beverage and detergent from the consumer packaging group have been recycled with some success. Other plastics in the consumer packaging group will often be too small (less than 10 g) thin film and contaminated with food waste. Mechanically recycling of these is unlikely to be economically beneficial. Incineration

with energy recovery is the best disposal option for municipal solid waste.

Plastic scrap from the plastic product manufacture has been recycled as standard for many years. This scrap has never been in contact with contaminants and is easily recycled.

Gregham Plastics Plc is a recycler that receives plastic scrap from manufactures and plastic packaging waste for reprocessing. Gregham Plastics recycle mainly PE and some PP. The scrap is granulated in a granulator to particle size $5 \times 5 \times 5 \text{ mm}^3$. The packaging waste needs a little more sophisticated cleaning to remove contaminants. At Gregham Plastics they don't wash the incoming plastic waste but only accept relative clean material. Washing requires water and also a dryer to dry the plastic waste before further processing. The bales of waste plastic packaging film are opened and the plastic film is transported on a conveyer belt through a metal detector. This is because any metal parts eg staples can damage the fine blades that cut the plastic film up in the next stage of the process. This "cutter" works like a blender, and cuts the film into $5 \times 5 \text{ mm}^2$ large pieces. After cutting the small plastic pieces they are fed directly into an extruder. The solid polymer pieces drop onto a screw which rotates inside of a barrel when melting and pumping take place. The plastic waste is heated till approx 240°C . Right after the extruder there are filters which filter solids off the melted polymer. This can be paper labels attached to the film, PVC (which have a higher melting point) or gravel. The filters are cleaned automatically by backwash when the pressure in the barrel is above a certain endpoint. The melted plastic is taken through a vacuum chamber where gasses (air and emissions from partly burnt labels) and oils evaporate off. Next stage is pelletisation and solidification. The technic can easiest be described as a mincing machine. The melted plastic is forced through a dish with a lot of small holes (2 mm in diameter). When a pellet 3 mm long is formed, a knife cut it off. At the same time cooling water is sprayed over and the plastic solidifies.

To maintain constant level of quality in outgoing materials, the scrap and packaging waste plastics are mixed together. A batch (10 tonnes) of granules and pellets are mixed and the mixture is fed into another extruder which makes the finished pellets almost at the same way as described above. The pellets are packed in boxes or bags on pallets and wrapped in plastic film. The recycled plastic reprocessed at Gregham Plastics is sold to a plastic film manufacturer. A

sample of recycled plastic pellets is shown in appendix 1. Gregham Plastics produce 600 tonnes/month.

Practicals.

The recycled plastic is gray because Gregham Plastic accept mixed colours. It is possible to dye the recycled plastic either black or white, but not bright colours like blue or red. Most recycled plastic is dyed black. As mentioned above, Gregham Plastics accept labels on the plastic film. If a company have PE-film packaging waste in mixed colours and labels attached in significant quantities (min five tonnes), Gregham Plastics offer to collect the waste FREE OF CHARGE! A sample (20x20 cm²) of the plastic to be recycled must be sent to Gregham Plastic on beforehand for identification of the plastic type. That's a good deal for companies which than save expenses for transportation of the goods and landfill tax. Further Gregham Plastics can provide a compactor if there is enough plastic waste for frequent pickups.

An even better offer from Gregham Plastics is this: they will pay up to £100 per tonne waste with no labels attached. Mixed colours are still accepted.

But the best offer is £250 per tonne plastic waste if the waste producer can make plastic waste with no labels and no colours! This clear plastic can be made to new clear recycled plastic and is in high courses. Larger amounts of waste will be bought for a better price.

Conclusion.

If there is no market, then there is no recycled plastic! Therefore always ask for recycled plastic. A demand for recycled plastic will make prices for plastic waste increase and more will see the sense in recycling plastic. That's the only way forward, as recycling for the case of recycling is

not an environmentally good option! I recommend ICL to recycle either PE or EPS or both, but do not implement recycling schemes for both plastic types at the same time as confusion probably will occur among the staff. All other combustible waste to be incinerated with energy recovery if possible.

Useful contacts.

Breckland Plastics Ltd.
Att. Steven Charse
Mile End Works
London Road
Brandon
Suffolk IP27 ONG
01842 810 751

British Plastic Federation
Environment Team
5/6/Bath Place
Rivington St.
London EC2A 3JE
0171 457 5000

EPS Recycling Information Service
126-128 Cromwell Road
London SW7 4ET
0171 341 9360

Anders B. Nielsen
c/o Peter Bjergskov
Nygardsvej 34
2750 Ballerup
Denmark
00 45 44 97 91 66

References.

Report Number 3

Project Title: 'Total Environmental Information Requirements for a Multinational Computers Company'

This Report: 'The Development of Environmental Information Management (EIM) at a Corporate Level '

Supervision: -

Academic: Dr. Sue Grimes, Brunel University

Industrial: Joy Boyce, Corporate Environmental Affairs Manager, ICL plc

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1. Introduction

Over the third six-month period, the research has concentrated further on legislative drivers including both the UK Producer Responsibility (Packaging and Packaging Waste) Regulations 1997 and the expected European Directive on waste electrical and electronic end-of-life goods. As discussed in both the six and twelve month reports, it is becoming increasingly important for companies to begin to manage environmental information with an efficiency that parallels any other information management processes within the business. The importance of developing such necessary processes is especially highlighted by the environmental risks associated with falling short of legislative information requirements.

This report includes ICL's Corporate Environmental Policy and Targets and the system for gathering the data together. The internal communication processes behind the reporting processes for packaging legislative compliance are detailed in the twelve-month report. As I have now been appointed the role of manager for the packaging project, this report describes the plans being made to further improve the packaging waste legislation reporting processes by developing existing information systems within the company.

2. Report Summary

Annex 1: Packaging Waste Site Survey

A survey, in the form of questionnaires, was carried out aimed at gathering information on waste and recycling at all the ICL sites. The questionnaires were sent to all ICL sites' facilities departments. Although all the sites responded the information given was low in quality and little was gained relative to the waste measurement reviews apart from providing an idea of the costs of waste management for ICL. The annex was compiled and written by the author under the guidance of Mrs Joy Boyce.

Annex 2: Packaging Waste Assessment for Legal Compliance CLC Waste Measurement Audit Reports

In order to assess the capacity of ICL to meet its packaging obligations a waste measurement review was carried out as part of a waste review at one of ICL's largest sites at Stevenage (twelve-month report page 11 and Annex II). In January, two waste measurement reviews were carried out at one of ICL's other warehouse sites (CLC) at Warrington. The results from all the waste measurements taken have been integrated in order to make an assessment of ICL's overall packaging waste arisings and the reports are detailed in Annex 1. The annex contents were written by the author.

Annex 3: Waste Manual

In order to improve the general awareness and training of staff on environmental waste management a waste manual was written. It has been designed to include relevant legislation and general environmental best practice guidelines, pertaining specifically to waste from the IT industry. There are areas, however, that will require updating as the related activities evolve within the industry sector. It is intended that it will be put

onto the ICL intranet site in order to facilitate access for staff. The Manual was written by the author and the presentation edited by Simon Skentelbery.

Annex 4: Packaging Workshop - ICL's Corporate Information System (3PI)

As discussed in the six-month report (page 4), the flattening of ICL's organisational structure and empowerment of the individual businesses has resulted in a lack of centralised information. Internal barriers have been created to information flow by this organisational structure. This may well be a common problem in the many organisations that have carried out similar management strategies in recent years. The chairman of ICL, Keith Todd, is promoting a more co-operative and less competitive culture known within the company as 'One ICL'.

The packaging legislation has highlighted these barriers to information flow within an organisation such as ICL. The competitive culture between the ICL businesses has prevented the free exchange of packaging information internally. To address this problem, funding internally is being sought from the budget allocated for 'One ICL' projects to develop the corporate information system known as 3PI to meet the packaging information requirements of the ICL Group.

As described in the twelve-month report (page 11) questionnaires have been written in order that ICL businesses can make their packaging returns to CEA in a standardised format. The problem that is now being addressed is how to ensure the accuracy of these returns and, therefore, the changes that need to be made to 3PI.

In a workshop with an ICL business consultant, we formulated a model of information requirements for the packaging legislation. It is intended that this be applied to the corporate information system known as 3PI, so that packaging information can be stored in such a way as to facilitate accurate and thorough returns to CEA. The system needs to be expanded to incorporate packaging data metrics and shipping

information in a way that marries the two sets of data and provides the required information. A meeting has been set up with ICL Retail in order to correlate the model developed at the business level with the model developed for 3PI. The result should be the production of the necessary framework with which to integrate packaging data into 3PI and should translate well for all the ICL businesses.

Communication with suppliers on packaging data information has shown a general lack of awareness and related actions with regards to the packaging legislation. A possible conclusion that can be drawn from this is that ICL would appear to be being more vigilant than its suppliers with regards to the packaging legislation. There is also a subsequent lack of knowledge with regards to packaging metrics which has resulted in ICL having to take measurements itself. One of the main advantages of investing in and developing the packaging information system is that it should provide the means for different ICL businesses to share packaging metrics and thus prevent duplication of effort. It will also provide the means for ICL businesses to ensure that double counting is avoided when it comes to making their packaging returns to CEA.

As discussed in the twelve-month report, page 13, there is a need for information systems to be developed within organisations in order for them to manage packaging information effectively. It goes on to discuss the need for government to ensure a closing of the life cycle loop in terms of the recycling and recovery infrastructure. The fact that it is mandatory to recycle packaging but not to purchase recyclate is being addressed by industry at present. They have put forward a proposal that the purchasing of packaging that contains quantities of recyclate is used to offset a company's obligations. This presents the requirement for additional fields on 3PI to be set up that will record the recycled content of the packaging. The annex was written by the author.

Annex 5: Corporate Environmental Policy and Targets Target Information Gathering System

The Corporate Environmental Policy and Targets are currently being updated and the information collected to date used to produce ICL's first Corporate Environmental Report. In order for the policy and target data to be monitored, a collection system was set up using the existing corporate data-file system. The collection of all the information and the maintenance of the IT programs that convert the data into a manageable format are my responsibility. New sites require all the information necessary for them to set up the system and send data in to CEA. For this purpose, a set-up package was written and is sent out to new sites or new site facilities staff if previously responsible people have failed to hand-over. ICL's Corporate Environmental Policy and Targets were written by Mrs Joy Boyce whilst the updated target gathering information system was compiled by the author.

Annex 6: ISO 14001 Legislative Procedures

As described in the twelve-month report (page 3) I assisted in the organisation of the Environmental Hands-on Audit module that was set-up at ICLE (ICL Enterprises) HQ in Slough. Active participation in ICL's ISO 14001 implementation projects has led to the writing of the legislative procedures for ICLE by the author.

3. Conclusions and Future Work

As organisational EIM is such an enormous area, the research is being provided a focus through performance indicators. As ISO 14001 is high on ICL's agenda, the research aim will be to develop performance indicators that support continuous improvement programs within ISO 14001. The main aim will be to formulate normalisation techniques whereby a large organisation can assess its environmental impact irrespective of its growth/ downsizing. As ICL is now purely a services and retailing organisation with the sale of its manufacturing arm, the areas that can be covered are supply chain management, waste management and product design and take-back.

A literature review is being carried out on performance indicators and information management within ISO 14001 and corporate environmental performance measurement. A report will be written of around 10, 000 words on the literature search results and research areas defined. This work should meet the basic requirements of the second year dissertation for submission to portfolio at the end of September 1998.

Report Number 3

Annex 1

Annex 1: Packaging Waste Site Survey

QUESTIONNAIRE FOR ICL SITES

THE UK PACKAGING REGULATIONS

The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997 were approved by the House of Commons on Monday 3rd March, and are now law. Together with the introduction of the Landfill Tax and its anticipated annual increases, this new legislation further emphasises the need for the ICL Group to control its waste management systems.

The costs of waste management to the ICL Group per annum is going to substantially increase over the coming years. Reductions in materials consumption are important to us, not only for environmental reasons but also for good business practice and use of our resources. The easiest and least expensive way of adhering to the new packaging legislation is to use our backdoor arisings.

The Department of the Environment will require us to account for our packaging waste and non-compliance is a criminal offence. We therefore need your co-operation to complete the following questionnaire as part of a preliminary assessment. Please could you take a little time to give us the following information - approximate figures are acceptable.

Name

Job Title

Site and Business

1. Who is responsible for waste management at your site and in your business group?

.....

2. Are you aware of the packaging regulations?

.....

3. Do you recycle and/ or reuse packaging? If so, do you have a compactor?

.....

.....

4. Who is your site's waste management company?

.....

5. How many tonnes/ skips of waste does your site produce per annum?

.....

6. How much do you spend on waste management per annum?

.....

7. Do you separate out waste arisings? If so, into what?

.....

.....

8. Do you have any data on types and amounts of packaging waste arisings at your site? For example numbers of cartons, numbers of plastic bottles etc. If so, in what data and in what format? Approximate figures are also very helpful.

.....

9. Do you know how much of the waste from your site goes to landfill, and if so, can you tell us how much it is? If it is not possible to give a tonnage for landfilled waste, let us know how much you are charged for landfilling by your waste management company.

.....

.....

10. If you recycle any of the waste arisings from your site, can you tell us what you recycle, roughly how much you recycle per annum, and any costs associated with recycling or any revenues that accrue - even if these are given to charity (for example, some sites recycle aluminium cans and give the money to a local charity).

.....

.....

Many thanks for your co-operation in giving us this information.
If you want to discuss the questions or any aspects of the packaging legislation, please contact us.

Corporate Environmental Affairs Department, LON11
Tel: 7221 3179
Fax: 7221 6671

Results Summary Table on Next Page

Site/Manager	Packaging legislation awareness	Recycle or Reuse Compactor?	Waste mgt. Company	Tonnes/Skip p.a.	Spend £ p.a.	Segregation	Data	£
Bra04 Liz Buxton Facilities Manager	Aware	yes no compactor	Lozhi Environmental Ltd Midlands Waste Paper	700 skips general waste 52 skips scrap parts	£15 k approx.	yes computer scrap parts and cardboard	52 skips of cardboard recycled p.a.	n
Bra01 Barry Bennett Facilities Account Manager	Aware	yes	Marriott Commercial Services	0.15t cardboard packaging for recycling 145t general 70t kitchen waste 55t paper for recycling	£11.2 k	yes confidential paper waste paper for recycling metal cardboard glass bottles plastic cups Al cans	34,000 cans 461 kg plastic cups	£
Bra06 Lee Reynolds Facilities Manager	Unaware	no recycling have a compactor for general waste	SKIFA	1040 skips pa general waste	£24.75 k	no	no data	u
Bra02 Peter Gidley Resource Manager Pete Weston and Elizabeth Clarke	Unaware	yes no compactor	unknown	unknown	unknown	no	no	u
Bra01 Yvonne Barr	Unaware	yes no compactor	Cleanaway SCA	156 skips pa	£8 k	yes white paper (classified and non-classified)	classified paper waste approx 25 tonnes pa	£
CLC Howard Andrews Transport Manager Kim Hayton	Aware	yes compactor	Cleanaway	150 t pa	£8 k	yes pallets paper cardboard	5,000 pallets pa	£
Bra01 Sue Stewart Facilities Manager	Aware	yes no compactor	Cleanaway	422 skips pa	£13.5 k	yes paper Al cans	Al cans 1021 skips pa paper 490 skips pa	£
Fel01 Mike Burke Facilities manager	Aware	yes	Marriott Cleaning	72t approx. general 25t approx. paper for recycling	£3.5 k	yes	31,200 Al cans p.a.	£
Bra01 Liz Buxton Facilities Manager	Aware	yes compactor	Cleanaway	100 skips pa	£10 k	yes paper toner cartridges re-use cardboard boxes	no data	£

Site/Manager	Packaging legislation awareness	Recycle or Reuse? Compactor?	Waste mgt. Company	Tonnes/Skip p.a.	Spend £ p.a.	Segregation	Data	U
Mdn04 Retail Systems Carol Dawson Site facilities Administrator and Elizabeth Clarke	Unaware	yes	Grundon		£1.33 k	no	no	u
Man05 Douglas Hall Maintenance and Energy Manager Arthur Stoddart	Aware	yes	Biffa	240 tpa general waste 100 tpa recycled	£9 k	yes cardboard boxes kitchen waste general waste wood	plastic cups 911 kgs pa	£
Man24/25Lee01 /12 Wak01/02 John Schofield Facilities Manager	Aware	yes (1 site) compactor (1 site)	Cleanaway, Hannay Local Council	80 skips pa	£16 k	yes paper		
New05 Elaine Kerr Facilities Manager	Unaware	no	Greencare	1150 skips	£8 k	yes plastic cups	plastic cups 20kgs pa	
Rea21 WVB Jardine	Unaware	no no compactor	Reading Borough Council	936 skips	£4 k general waste £500 classified waste	yes white paper (classified and non classified) cans plastic cups	paper: 2000 kgs plastic cups: 35000 kgs p.a.	£
Rea21 WVB Jardine	Unaware	no no compactor	Grundon	1110 skips	£2.5 k normal waste £1.5 k classified waste	yes white paper (classified and non classified) cans plastic cups	paper 2200 kgs pa	£
Slh01 Sue Lockley Building supervisor	Unaware	yes	Grundon	780 wheeler bins	£4.5 k	yes	no	
Slh06 Ken Elites Facilities Manager Ver Wilkin	Aware	yes compactor	Grundon	1150 tpa	£5.5 k	yes Cardboard kitchen waste general waste	plastic cups 160 tpa	£
Ste Ken Johnson Senior facilities Manager	Aware	yes	RCO Support services Shanks and McKewan	820/ 260 skips	£40 k	yes, costs £2700 p.a.	no	£
Slh06 Diane Black Support services	Aware	yes no compactor	Cleanaway Ltd	140 skips general 110 skips paper for recycling	£8 k	yes paper plastic cups Al cans flour (charity)	no	
Win01 Dianne Flatt Facilities	Unaware	yes no compactor	Grundon Sevenside Data Security	120 skips pa	£4 k	paper plastic cups audio tapes	no data	

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Annex 2

**Annex 2: Packaging Waste Assessment for Legal Compliance
CLC Waste Measurement Audit Reports**

**Packaging Waste Assessment for ICL's Compliance to the UK Producer
Responsibility (Packaging and Packaging Waste) Regulations 1997**

Introduction

A waste measurement strategy was designed as part of an environmental waste review carried out at ICL's largest site at Stevenage. This yielded the amounts of packaging waste arising at two of ICL's major warehouses, that of ICL Sorbus and ICL Retail. The details of the waste measurement strategy and waste review are held in the twelve-month report, annex 2.

In January of this year, two waste measurement audits were carried out at a third major ICL warehouse, CLC, at Warrington. The results of all the waste measurement reviews carried out were correlated, in terms of material flows, with total annual waste information from the contracting waste management companies. This enabled estimates to be calculated of average packaging waste arisings from the two sites, and therefore, how much packaging waste is available for recovery and recycling.

The aim of the exercise was to establish how closely ICL could meet its packaging waste obligations under the UK packaging legislation from these two sites. The results were analysed and a comparison made between the ICL's obligation for this year, based on 1997 data, and the waste arisings for the two sites.

Results

An average was taken of the two CLC estimates for annual material composition (based on Cleanaways data). The data for Stevenage was calculated from the percentage compositions of the waste review results against the data provided by WML in the waste survey summary, see annex 1, i.e. 820 T per annum. The table on the next page shows the results from the Stevenage waste review and the calculations made.

Material	Obligation	Waste Arisings		Balance
		SteXX	CLC	
Paper	Recycling 61.29	374.7	86.5	399.91
Plastic	Recycling 4.91	107.3	23.8	126.19
Steel	Recycling 0.34	0	0	- 0.34
General	Recovery 361.19	(399.91+126.19= 526.1)		164.91

Conclusion

The results clearly show that ICL can easily meet its packaging obligations from the two sites, thus minimising the environmental impacts, such as transport, and associated costs of using other sites as well or reverse logistics for the return of packaging. The minus balance for steel will be covered by the special arrangements being made for steel Packaging Waste Recovery Notes (PRNs) i.e. the PRNs will be bought from British Steel directly.

Waste Sampling

Date of Sampling	Location	Weight (kg)													BACKDOOR ARISINGS	TOTAL
		PU	PP	PE	PS	EPS	Plastics	Card	Comp.	Paper	Misc.					
03/07/97	STE 10	7.2	4	40	4.4	0.6	56.2	218.4	8	91.2	6				365.8	379.8
10/07/97	STE 10	3.2	8	50.4	6	1	68.6	226	10	114.8	1.6				409.4	421
31/07/97	STE 10	16.8	13	76.5	5	0.4	111.7	147.2	39	65	52				323.9	414.9
11/07/97	Lorry Park	17.6	2	34	24.8	0.5	78.9	522.8	24	75.6	748.8				677.3	1450.1
16/07/97	STE 14	29	7.5	67	37.5	8.5	149.5	156	46.5	113.5	9				419	474.5
30/07/97	STE 14	28	10	70	30	8	146	256	18	64	22.6				466	506.6
06/08/97	STE 14	15	10	50	35	15	125	132.5	7.5	100	18				357.5	383
15/07/97	STE 04	0	0.5	6	16.5	0	23	167	10.5	6	309				196	515.5
29/07/97	STE 04	0	0	2	4.8	0	6.8	84.4	14.4	14	591.6				105.2	711.2
07/08/97	STE 04	0	0	4	8	0	12	140	5	8	456				160	621
05/08/97	STE 09	0	0	0	0	0	0	12	0	0	51.2				12	63.2
TOTAL		116.8	55	400	172	34	777.7	2062	182.9	652.1	2266				3492.1	5940.8
%age Comp.		1.966	0.93	6.73	2.9	0.57	13.09	34.71	3.079	10.98	38.14				0.59	100.0
Annual (based on 820 T.p.a)		16.12	7.59	55.2	23.7	4.69	107.3	284.7	25.25	90.01	312.8				4.82	820.0

Waste measurement audit at Tplc Warehouse (clc)

Undertaken by: Gail Collins (ICL Corporate Environmental Affairs)
Simon Skentelbery (ICL Corporate Environmental Affairs)
Date: 6th January 1998
Waste Man. Co: Cleanaway/OSR Recycling

1.1 Introduction

A packaging waste measurement audit was carried out on the Tplc Customer Logistics Centre (CLC) at Warrington. Packaging waste was sampled directly from 12 wheely bins, and weighed according to material type. Data from sampling is to be used to calculate the site's total annual backdoor arisings which can be recycled, and which materials can be effectively recycled. The process took approximately five hours to complete.

2.1 Sampling strategy

Packaging waste was sampled directly from a series of 12 large wheely bins dispersed around the CLC warehouse. The waste was measured according to material type on digital Post-Office scales in grams. The waste in each of the wheely bins was segregated using bin liners according to material type and weighed. Once this process was completed and the bin empty, it was refilled before proceeding to another bin. One working day's worth of packaging waste had been sampled when all bins had been emptied and any other packaging waste stacked around the warehouse weighed.

From the data produced, it was possible to calculate the quantity of packaging waste per year and determine which material types were present in high enough volumes to enable effective recycling. The percentage material type flow was calculated and multiplied against the total waste data provided by Cleanaway.

Before proceeding with sampling, the Audit Team were advised that the amounts of packaging waste likely to be present would be quite low, in comparison with other periods. Thus, the annual packaging waste figures have to be adjusted by undertaking a further measurement audit during a particularly busy period. A provisional date of Tuesday 27th January was set, as business peaks towards the end of each month.

1.2.1 Health and Safety Issues

Regard had to be given to certain Health and Safety issues, including being aware of moving vehicles within the warehouse, and the use of protective boiler suits.

2. Conclusions

The calculations based on Cleanaway's data gave quantities approximately double our results from the measurements made. The results confirmed the fact that the data collected represents minimum quantities for a monthly period. Therefore, this report concludes that a second waste measurement audit should be carried out at the end of January in order to more accurately assess the material flow from the CLC warehouse.

Results of the Waste Measurement Audit at TPLC Warehouse (CLC) on Tuesday 6th January 1998

Material Type Weights (kgs)

	CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Totals
1 Day	169.74	38.009	0.875	1.49	0.34	0	0	3.1	3.885	1.275	0.5	219.214
Annual	42774.48	9578.268	220.5	375.48	85.68	0	0	781.2	979.02	321.3	126	55241.93

Percentage Material Type (%)

	CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Total
	77.43119	17.33876	0.399153	0.679701	0.1551	0	0	1.414143	1.772241	0.581623	0.228088	100

Data From Cleanaway (kgs)

Date		Date	
03/11/97	1640	01/12/97	2750
10/11/97	1910	08/12/97	2710
17/11/97	1810	15/12/97	2180
24/11/97	1160	22/12/97	4730
Totals	6520	+	12370
		=	18890
			Annual Estimate = 113340

Estimate Annual Material Composition (Cleanaway Data * Percentage Composition) (kgs)

	CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Total
	87760.51	19651.76	452.4004	770.3732	175.7899	0	0	1602.79	2008.658	659.212	258.5145	113340

Waste measurement audit at Tplc Warehouse (clc)

Undertaken by: Gail Collins (ICL Corporate Environmental Affairs)
Simon Skentelbery (ICL Corporate Environmental Affairs)
Date: 27th January 1998
Waste Man. Co: Cleanaway/OSR Recycling

1.1. Introduction

A second packaging waste measurement audit was carried out on the Tplc Customer Logistics Centre (CLC) at Warrington. The results gained from this second audit will be used as a comparison with the initial audit carried out on the 7th January, and allow an average to be calculated. The methodology was the same as that used for the initial measurement audit. The process took approximately three hours to complete.

1.2. Sampling strategy

Methodology as initial audit. This second audit was carried out in order to determine a high packaging waste flow, to be compared with the initial measurement audit, which was believed to be a low flow period. The period of this second audit, late in the month of January, is believed to be a particularly busy period.

1.2.1. Health and Safety Issues

As initial audit.

2. Conclusions

The results show that the amount of packaging waste available for recycling from week to week is quite unpredictable. However, material flows are comparable when calculated from percentage material type and monthly data from Cleanaway. This calculation shows that the estimated annual material consumption figures are proportional to those measured during the second measurement audit.

However, it must be considered that the data provided from Cleanaway would include office waste. Upon analysing the figures, it is possible that up to 30% of the Cleanaway totals would include office waste. Thus, when calculating Cleanaway's annual figures, this must be taken into consideration. It is also important to consider that the annual estimates for material composition are calculated using Cleanaway data available for two months only (November-December). For this calculation to be as accurate as possible, it will be necessary to obtain a full annual amount for 1997 of warehouse waste only (total Cleanaway figure, minus office waste of approx. 30%), and calculate the estimated annual material composition again.

From the results obtained, it can be seen that a good correlation can be drawn regarding the estimated yearly annual material composition for card and polyethylene and the actual amounts weighed at any one time in both measurement audits. These two materials, in particular, are likely to be of most importance in any recycling regime as they are found in largest amounts and will be easiest to collect and separate.

Results of the Waste Measurement Audit at TPLC Warehouse (CLC) on Tuesday 27th January 1998

Material Type Weights (kgs)

	CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Totals
1 Day	32.002	6.715	1.32	0.685	0	0	0	0.66	0	0	1.17	42.552
Annual	8064.504	1692.18	332.64	172.62	0	0	0	166.32	0	0	294.84	10723.1

Percentage Material Type (%)

CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Total
75.20681	15.78069	3.102087	1.609795	0	0	0	1.551043	0	0	2.749577	100

Data From Cleanaway (kgs)

Date		Date	
03/11/97	1640	01/12/97	2750
10/11/97	1910	08/12/97	2710
17/11/97	1810	15/12/97	2180
24/11/97	1160	22/12/97	4730
Totals	6520	+	12370
		=	18890
			Annual Estimate = 113340

Estimate Annual Material Composition (Cleanaway Data * Percentage Composition) (kgs)

CARD	PE	PP	PU	PET	PVC	METAL	EPS	COMP	07 STAT.	Misc.	Total
85239.39	17885.84	3515.905	1824.542	0	0	0	1757.953	0	0	3116.371	113340

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Annex 3

Annex 3: Waste Manual

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5. Legal Aspects of Waste Management at ICL

Part II of the EPA 1990 is the primary statute regulating waste management. It increased regulations on waste management and placed responsibility on waste handlers and **all who handle waste**. This responsibility is defined by the Duty of Care which if breached constitutes a **criminal offence**. The legal definition of waste is outlined in the EPA 90 Schedule 2B (see Appendix 1). Anything that is discarded or dealt with as if it were a waste must be presumed to be waste unless it is proved not to be.

5.1 Duty of Care Law

1.1.1 The duty of care is set out in section 34 of the Environmental Protection Act (EPA) 1990. Those subject to the duty must try to achieve the following four things:

- a) to prevent any other person committing the offences of disposing of controlled waste¹ or treating it, or storing it.
 - without a waste management licence; or
 - breaking the conditions of a licence; or
 - in a manner likely to cause pollution or harm to health;
- b) to prevent the escape of waste, that is, to contain it;
- c) to ensure that, if the waste is transferred, it goes only to an “authorised person” or to a person for “authorised transport purposes”
- d) when waste is transferred, to make sure that there is also transferred a written description of the waste, a description good enough to enable each person receiving it.
 - to avoid committing any of the offences under a) above; and
 - to comply with the duty at b) to prevent the escape of waste.

1.1.2 Those subject to the duty must also comply with regulations which require them to keep records and make them available to authorities.

1.1.3 Failing to observe the duty or the regulations is a criminal offence.

All those responsible for disposing of ICL’s waste must provide an audit trail of transfer notes and retain them for inspection for a period of up to 2 years. Copies of these transfer notes should be sent to ICL Corporate Environmental Affairs (CEA) annually.

5.2 Special Waste

Most of ICL’s waste is what is known as Controlled Waste, but certain more toxic waste is known as Special Waste. Special Waste needs particular procedures to be in place due to the Special Waste Regulations 1980 which were recently amended in 1996.

¹ Controlled Waste is defined as waste from commerce, industry and households. The main exemptions that are not Controlled Waste are wastes from agricultural premises, mines and quarries, and wastes that are radioactive or explosive.

Special wastes at ICL include fluorescent light tubes, batteries and some electronic equipment and oils. Fluorescent light tubes and batteries waste are covered in section 2.1 and 2.2 respectively. Special Wastes are subject to the Duty of Care in the same way as any other controlled wastes.

The Environment Agency should be notified before the waste is first collected. **An audit trail and documentation record of the waste's disposal should be kept, as in the case of controlled waste.** However, the documentation necessary for Special Waste are known as consignment notes. The relevant section should be filled in, the Agency sent the top copy of a set of the five notes, and the remaining copies sent with the waste.

The record of consignment notes must be retained on a register for at least 3 years, and copies sent to CEA. Within two months of the disposal, a fee of possibly £15 will be payable to the Environment Agency. **If ICL sites send Special Wastes for recycling/disposal, the persons responsible must ensure that the recipient is licensed for the receipt of this type of waste.**

Under regulation 17, it should be ensured that the Special Waste is not mixed with different categories of Special waste or with non-Special waste, unless authorised by a waste management licence, or the waste management activity is exempt from licensing.

5.3 Batteries and Accumulators (Containing Dangerous Substances)

Regulations 1994

A requirement to mark batteries containing heavy metals was introduced by the Batteries and Accumulators (Containing Dangerous Substances) Regulations 1994. The DTI is responsible for implementing the EC Batteries and Accumulators Directive (91/157), which covers batteries containing certain levels of lead, mercury or cadmium, i.e.

lead-acid automotive, nickel-cadmium rechargeable and silver or mercuric oxide.

They transposed certain requirements of the Directive in GB Statutory Instrument 232 in March 1994:

- Prohibition from sale of certain alkaline-manganese cells (other than button)
- Marking with separate collection and heavy metal symbols
- Design of appliances to allow easy removal of batteries

The other requirements of the Directive, e.g. research, separate collection systems, reduction in household waste, are the subject of a voluntary programme which has been drawn up with the industry through their trade associations. This is being examined by the European Commission.

The European Commission's DGXI has released a draft proposed directive on batteries. The new draft directive is considerably more far reaching than the present battery directive (91/157/EEC). The new draft directive covers all types of batteries and accumulators, as well as the appliances into which they are incorporated.

There is expected to be targets set for recycling, requirements for provision of data, and that there may be environmental taxes placed on their disposal. In addition, requirements for labelling and design for ease of disassembly are more far-reaching than previously.

5.4 Labelling and Transport of Special Waste

The Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations 1994. The CDG (CPL) Regulations require that Special Waste packages clearly show specific information that must be clearly and indelibly marked on the package. Although this may fall to the recyclers to carry out, those responsible for ICL's waste should ensure that the appropriate measures are taken.

5.5 Waste Management Licences

5.5.1 *The Waste Management Licensing Regulations 1995*

These regulations define waste as "items which have been discarded so that they are no longer part of the normal commercial cycle or chain of utility". When a material has been reprocessed so that it can re-enter the commercial cycle it is still considered to be waste. The regulations state that anyone who arranges disposal on behalf of their clients must have a waste brokers licence. To obtain the licence an application should be made, to the Environment Agency, and a payment of £95 for 3 years. Therefore, it is necessary that anyone responsible for contracting waste management out of ICL should ensure that the Contractor holds a license.

5.5.2 *Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991.*

These regulations clearly set out the requirement that waste carriers be licensed unless they are exempt. **Therefore, it should be ensured that any parties concerned with ICL's waste transportation activities should possess a Waste Carriers Licence.** When selecting a registered waste carrier the first point of contact should be the local Environment Agency office.

5.6 The Landfill Tax

The Environment Act 1995 introduced the concept of landfill tax. The tax is payable on all waste which goes to landfill. Currently the tax is £7 per tonne, with a reduced rate of £2 per tonne for inert waste. These costs, however, are expected to rise sharply and a rate of £27 per tonne by the year 2000 has been predicted. Recycled waste is not subject to the tax and an increased recycling rate will save money. Information regarding waste recyclers is in section ? **All data regarding office waste should be sent to CEA for comparison against the mandatory Corporate Environmental Policy and Targets.**

5.7 The UK Producer Responsibility (Packaging and Packaging Waste) Regulations 1997

The proposed UK legislation is framed to ensure that responsibility for the recovery and recycling of packaging is shared in various percentages throughout the packaging chain. The legislation confers an activity obligation on each of these stages.

The legislation requires companies in the packaging chain to record and measure the amount of packaging they handle and calculate their total tonnage obligation for recovery and recycling. This entails ICL Plc. registering with the Environment Agency and providing detailed information on packaging handled, imported and exported.

This means tracking the packaging flow from the organisation's sales figures so that we know how much of our packaging is put into the environment each year. This figure forms the basis for our target for recovery and recycling the following year.

Packaging material types are split into plastics, metals, paper/fibreboard and glass. The implications for the management of packaging in the organisation are to reduce, reuse, recycle, and recover, as much packaging. To comply with the packaging legislation we would have to ensure the recovery and recycling of the necessary tonnage for which we bear an obligation.

On an annual basis we will have to provide a "certificate" which confirms that the necessary tonnage of packaging have been recovered and recycled, the source and type of materials recovered and the identity of the reprocessor who has received the packaging waste for recovery and/or recycling. The proof of these details is provided by Producer Responsibility Notes from recyclers. **When packaging waste is sent to a recycler CEA should be informed of the details so that the necessary arrangements can be made to secure the required Producer Responsibility Note (PRN). Details of packaging recyclers are in Appendix A.**

5.8 EU Draft Directive on Electronics End-of-Life

The draft EU Directive on end-of-life electronics equipment has now been written. It is expected that this Directive, once translated into UK law, will mean that organisations will have specific recycling and recovery targets to meet. As certain components of electronic waste are considered to be hazardous special care must be taken in their disposal. Environmental audits have been carried out on various electronics recyclers and **anyone responsible for electronic waste recycling on behalf of ICL should contact CEA.** An electronics recycling manual is in progress.

6.0 Waste Disposal Options

All information in this section aims to supplement Section 1 and the legal requirements it outlines.

6.1 Fluorescent Light Tubes

Fluorescent light tubes are Special Waste because of their hazardous properties. It is illegal for fluorescent tubes to be incinerated, or be subjected to the possibilities of leakage because the mercury they contain present a toxic hazard to humans and the environment.

In the light of these difficulties and the environmental impact of mercury, a more satisfactory alternative to landfilling is to collect the tubes for recycling. In order to prevent any leakage the fluorescent tubes should be securely contained by seeking the provision of special containers from fluorescent tube recyclers.

Methods have been developed for recycling of fluorescent tubes. Technology from Sweden has enabled the set up of a nationwide recycling scheme for fluorescent tubes and lamps. The MRT System (Mercury Recovery Technology) recycles by extraction of mercury from all tubes and lamps.

A recycling system for fluorescent lighting tubes is now being operated by Biffa Waste Services through its Backtrack service, a nationwide collection system designed for small quantities of products that need special handling. **For information relating to recyclers of fluorescent tubes, see Appendix C.**

6.2 Batteries

Spent batteries can either be returned to suppliers/ manufacturers or collected for recycling. Batteries should be packed safely for transit using strong ABS pallet boxes, and strong PVC bags (sheets are not appropriate due to slitting). The packaging should be appropriately labelled according to the legal requirements.

The picture of the wheeled bin with a cross through it, meaning not to be landfilled, can be misleading as wheeled bins are more often than not used for recycling in the UK. Also, the packaging label will be long forgotten with the average life span of the battery being around 5 years in some cases.

Recycling processes for non-rechargeable dry cell batteries are being developed that are cost effective. Stockpiles can be argued as possibly more hazardous than diluted landfill disposal. **For more information on battery recyclers see Appendix C.**

6.3 Oils

Oils drum should be banded when stored for recycling/ disposal to prevent leakage. Lids should be kept tightly on the drums when not in use in case they should be upset and spill their contents. Care should be taken to not store the drums where the ground slopes down

towards drains. Oil should be reprocessed where possible. **For more information see Appendix C.**

6.4 Office Waste

6.4.1 Paper

Office paper should be recycled wherever possible. However, in order to reduce costs related to the purchase of paper and reduce waste management costs ICL sites should minimise the consumption of these materials. To lower the paper consumption, some recommended actions include:

- Double sided photocopying and laser printing.
- Optimise use of Email system. Do not print Email unless essential.
- Extend and promote the use of spell check and print preview tools on spreadsheet, word processing and presentation packages to avoid basic typing and layout mistakes before printing.
- Employ used paper for printing non-essential work wherever possible

Only when paper cannot be reused should recycling be carried out. It is easy to set up a recycling scheme as a large number of contractors are available. The paper should be separated into office and coloured paper before undergoing recycling. Separation is important as it will impact on the quality and the cost of the recycling. White paper will be present on ICL offices sites in large amounts; colour paper arises only in small amounts on ICL sites. Bins should be located in strategic places such as in printer rooms and near photocopy machines. Although the bins must be acquired and paid for, waste collection is free of charge, representing a reduction in waste management costs. **Companies offering paper recycling services can be found in Appendix A.**

6.4.2 Printer consumables

Printer consumables include drums, developer units and toner units. D2D offers a remanufacturing service of laser printer consumables to both ICL customers and ICL internal businesses. All laser printer consumables should be sent to D2D at Kidsgrove, where it will be recycled. A remanufactured unit is available at a price greatly reduced from that of new identical unit. This scheme helps in reducing our impact on the environment and reduces costs considerably when purchasing printer consumables.

6.4.3 Packaging

All items such as IT equipment for internal use, stationery and paper comes with packaging. As a result of the Packaging Regulations highlighted in Section 1.7, all ICL businesses must undertake the minimisation and recycling of packaging and packaging waste. Although in some cases packaging waste does not arise in large enough amounts to warrant regular recycling collections, packaging should be separated as material type (where known) and placed in separate skips for recycling. The number and regularity of collections should be decided on an individual basis, with collections only undertaken when sufficient packaging materials are available. ICL CEA should be contacted if site services are unsure about what quantities are sufficient to enable cost effective recycling.

Packaging materials typically found on ICL sites include (label and identifying mark in brackets):

- Polyethylene, high and low density (2-PE): *bubble wrap, polythene bags*.
- Polypropylene (5-PP): *pallet strapping*.
- Polyurethane (7-PU): *foam inserts*.
- Polystyrene, normal and expanded (6-PS): *molded inserts*.
- Cardboard boxes.

Other packaging materials that may be present includes:

- Metal mainframe pallets.
- Wooden pallets.

Typically, card and polyethylene will be found in sufficient quantities to allow recycling. Where possible, a system of reverse logistics should be applied to take-back packaging delivered with equipment. **Companies with a offering recycling services for a range of materials can be found in Appendix A.**

6.4.4 Disposable cups and beverage cans

These materials represent a large waste arising, both of which can be recycled successfully. ICL has been part of the Save-a-Cup scheme for recycling plastic cups for several years, and beverage can recycling is undertaken on all sites by a number companies. Plastic cups are constructed from polyethylene (PE-2) and disposed into special bins. These are collected by site services, and passed on to Save a Cup. Save-a-Cup recycle them into non-food plastic items, such as flower pots, coat hangers, audio and video tapes. As with paper recycling schemes, bins must be acquired by site services, but collection is free of charge, representing a reduction in waste management costs.

Aluminium and steel cans also represent a large waste arising. The opportunity for recycling these cans is very large as both materials are valuable raw materials, and should be recycled. Steel cans are generally found in larger amounts. The two material types should be separated, with clearly marked receptacles provided to ensure that cross-contamination does not occur. Collection of these materials should bring ICL sites a small revenue. **This revenue is to be given to charity, as part of ICL Impact on Society Quality Commitment.**

Information regarding recyclers of disposable cups and beverage cans can be found in Appendix B.

**APPENDIX A.
RECYCLERS OF PACKAGING MATERIALS:**

Card recyclers:

Greenbank Recycling
72 Valley Road
Welwyn Garden City
Herts AL8 7DP
(01707) 332525

London Recycling
4d North Crescent
Cody Road
London E16 4TG
(0171) 511 8000

Severnside
The Pines
Hoel-Y-Forlan
Whitchurch
Cardiff CF4 1AX
(01222) 615871

A full listing of national paper and card recyclers can be obtained from:

Independent Waste Paper Processors Association
25 High Street
Daventry
Northants. NN11 4BG
Tel: (01327) 703223
Fax: (01327) 300612

**NOTE: PRNs SHOULD ALWAYS BE OBTAINED WHEN
CONSIGNING PACKAGING MATERIALS TO A RECYCLER**

Plastic packaging (all types) recyclers:

<i>Gregham Plastics Plc./Breckland Plastics Ltd.</i> Mile End Works London Road Brandon Suffolk IP27 0NG (01842) 810751	<i>LinPac Plastics Recycling</i> Newton Lane Allerson Bywater Castleford West Yorks. WF10 2BH (01977) 603355
--	---

A full listing of national plastics recyclers can be obtained from:

British Plastics Federation
Environment Team
5/6/Bath Place
Rivington Street
London EC2A 3JE
(0171) 341 9360

EPS Recycling Information Service
126-128 Cromwell Road
London SW7 4ET
(0171) 341 9360

**NOTE: PRNs SHOULD ALWAYS BE OBTAINED WHEN
CONSIGNING PACKAGING MATERIALS TO A RECYCLER**

APPENDIX B RECYCLERS OF OFFICE WASTE

Paper Recyclers:

see Recyclers of Packaging Materials under Card

Printer Consumables Recyclers:

Contact: *Design to Distribution Ltd., Kidsgrove*

Plastic Disposable Cup Recyclers:

Save-a-Cup Recycling Company Ltd.
Suite 2, Bridge House
Bridge Street
High Wycombe
Bucks. HP11 2EL
Tel: (01494) 510167

Aluminium Beverage Can Recyclers:

Alchemy Recycling
Whemstead Road
Bennington
Stevenage
Herts. SG2 7BX
Tel: (01438) 869361

Alcan Aluminium Can Recycling
Latchford Locks Office
Warrington
Cheshire WA4 INP
Tel: (01925) 635314

Aluminium Beverage Can Recyclers (Cont.):

A full listing of aluminium beverage can recyclers can be obtained from:

Aluminium Can Recycling Association
I-Mex House
52 Blucher Street
Birmingham
West Midlands B1 1QU
Tel: (0121) 633 4656

Steel Beverage Can Recyclers:

Save-a-Can Recycling Ltd.
PO Box 18
Ebbw Vale
Gwent
NP3 6YL
Tel: (01495) 350818

A full listing of steel beverage can recyclers can be obtained from:

Steel Can Recycling Information Bureau (SCRIB)

69 Monmouth Street, London WC2H 9DG England
Tel: (0171) 379 1306

APPENDIX C BATTERY RECYCLERS

<i>APM Metals Ltd.</i> , Sittingbourne	(01795) 426021
<i>Bidwell Metals Ltd.</i> , Hadstock	(01761) 432391
<i>Chancename Ltd.</i> , Pudsey	(0113) 257 1228
<i>Straker Office Supplies Plc</i> , Mitcham	(0181) 648 3434

A full listing of battery recyclers can be obtained by contacting:

Paul Duke, *British Battery Manufacturers Association*
Tel: (0171) 222 0666.

FLUORESCENT TUBE RECYCLERS

Independent Services Waste Management Ltd. (ISWML), Manchester
Tel: (0161) 877 0977

EDIBLE OIL RECYCLERS/REPROCESSORS

Contact: *Waste Exchange Services*
70 Brunswick Street
Stockton-on-Tees
Cleveland TS18 1DW
Tel: (01642) 677169

Report Number 3

Annex 4

Annex 4: Packaging Workshop for 3PI

Project structure:

Phase 1:

Product reference information capture and consolidation i.e. non-variables

Phase 2:

Capture and consolidation of shipment information and integration with phase 1 information

Information requirements for phase 2:

Q1: Is imported secondary packaging always jettisoned, or does it sometimes go to the customer?

Q2: Is imported primary packaging always jettisoned, or does it sometimes go to the customer?

Q3: Is shipped in secondary packaging shipped out or replaced (repacked)?

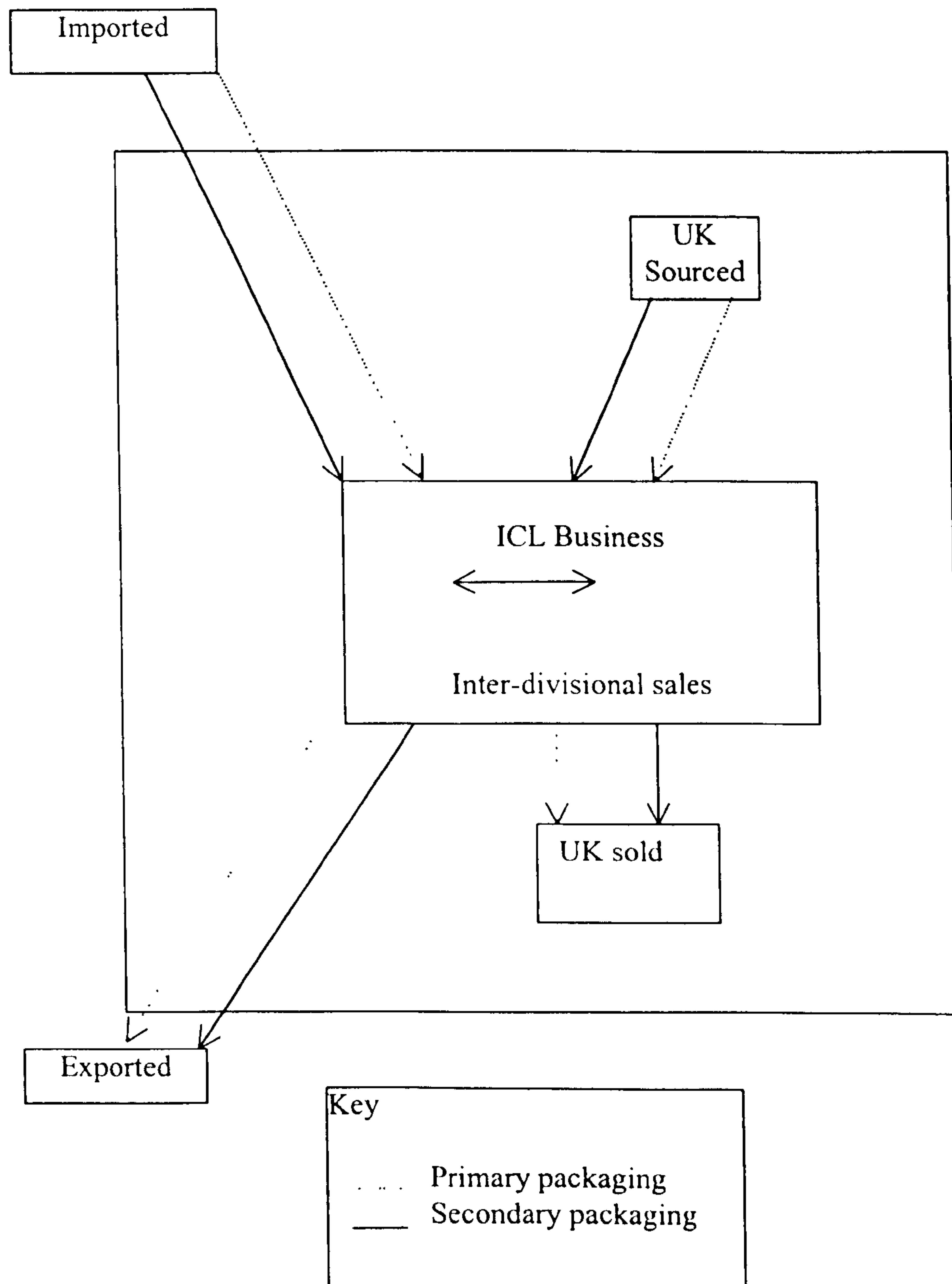
Q4: Is shipped in primary packaging shipped out or replaced (repacked)?

Q5: Does shipment go to a UK reseller, UK end-user or is it exported?

Q6: If the shipment goes to a UK reseller, are they obligated?

Q7: If despatching organisation acts as a packer/ filler and ships to the customer, who reports pack/ fill obligation?

Q8: Which products are pack/filled by a third party?



Definitions:

Obligation: packaging we are responsible for putting into the UK environment, of which we must recover and recycle a certain percentage.

Primary packaging: packaging in immediate contact with individual product for production during shipment to customer.

Secondary packaging: overall packaging around multiple product units for bulk shipment

Report Number 3

Annex 5

Annex 5: ICL Corporate Environmental Policy and Targets 1994-97
Target Information Gathering System

CORPORATE ENVIRONMENTAL POLICY

ICL is dedicated to the protection of all components of the environment which might be affected by its activities, and to the compliance with, and anticipation of, environmental legislation.

ICL Board members are committed to ensuring that our environmental policy is understood and implemented at every level of the organisation. ICL is committed to training and informing its staff on environmental matters. Our people are empowered to take individual actions to reduce the company's impact on the environment.

ICL will have measurable targets against which we can monitor our environmental performance. We will communicate throughout the ICL group of companies and externally our performance against the targets.

ICL will continue to work to minimise the effects of its operations and products on the environment through a process of continual improvement in our design, manufacturing and end-of-product-life processes, and will also adhere to environmental standards and legislation. We will remember the impact of our products on people - our products will exceed ergonomic standards.

ICL will introduce programmes for the recycling of products and waste, and is committed to reducing energy consumption in its products and operations.

ICL works with its suppliers to ensure that they in turn give thought and consideration to the impact of their processes and products on the environment. We also work closely with our customers to identify ways in which together we can improve awareness of, and impact on, the environment.

In particular we will monitor all parts of our business against these specific goals:

- * Design our products with a view to their eventual disassembly and their energy consumption, emission levels and ergonomic efficiency.

- * Aim to minimise the use of all materials, supplies and energy in our manufacturing operations, and, wherever possible, use renewable or recyclable materials and components and reduce levels of, or eliminate, any harmful emissions.
- * Promote the use of recycled materials where possible throughout our operations, initiate recycling programmes, and encourage re-use and refurbishment.
- * Minimise waste produced in all parts of the business and aim for continual waste reduction.
- * Expect similar environmental standards to our own from all third parties involved with our business - suppliers, vendors and contractors.
- * Assess on a continuous basis the environmental impact of our operations, and adopt an environmentally sound transport and logistics strategy.
- * Establish a comprehensive energy efficiency programme with a rigorous on-going plan for the reduction of energy consumption.
- * Support a comprehensive self-auditing environmental process throughout the organisation with our own targets and national, European and international standards as its benchmarks.
- * Encourage our staff in environmental initiatives and support them with training and awareness programmes on environmental issues.
- * Assist in developing solutions to environmental problems and support the development of public policy, and national, European and international legislation.

1994/97 TARGETS

A. LIFE CYCLE OF PRODUCT

Design

ICL has already begun to design its products for disassembly, for low energy consumption, in the use of recycled plastics, and in using materials and components which are environmentally conscious. Its efforts in this area are most advanced in its PC and mainframe computer product ranges. In 1994/97, ICL will extend its efforts for environmentally credible design to all of its products.

1994/97 Targets

ICL will continue to design its products for disassembly. New products will be designed to include maximum use of clip-on parts, standardisation of screws and the marking of plastics.

ICL will, where practicable, maximise the use of recycled plastics in new PC, terminal and mid range products which are in the design stage in 1994/97. In addition, ICL will look at increasing the use of recycled plastics in its specialist products for the retail and financial services markets.

ICL will, where practicable, design new products to include lithium batteries, condensers free from cadmium and poly-chloro-biphenols and will not use flame retardants nor sprayed EMI-shield coating on plastic housing.

ICL has already incorporated software which reduces energy consumption during operation in its latest range of PCs and has a mainframe range of computers with one of the lowest energy needs. It will seek to extend low energy consumption throughout its products.

1994/97 Targets

ICL will, where possible, seek to design new products with increased processing power with the same or lower energy consumption, where this is applicable.

Distribution and Packaging

ICL's packaging materials and methods already meet the minimum required standards in all the countries in which it operates.

1994/97 Targets

In 1994/97 ICL will, where practicable, offer to remove all hardware packaging on delivery, and, where condition of the material permits, will recycle or reuse it.

At present a significant percentage of ICL packaging is manufactured from recycled materials. During 1994/97 ICL will seek to increase this proportion by 5%. ICL will continue to design its packaging for disassembly, thus ensuring more effective recycling and reuse of packaging.

In many of its operations, ICL products are received, stored and distributed on reusable pallets. In 1994/97, ICL will seek to increase its use of reusable pallets by 5%.

During 1994/97, where feasible, ICL will work with its suppliers to identify which components can be shipped with the minimum amount of packaging, and to implement this reduction in packaging.

ICL already distributes a large proportion of its software and documentation electronically or in bulk on CD-ROM. In 1994/97 ICL will aim to increase the amount of software and documentation distributed in this way by 50%, making a significant saving in paper, printing, packaging and transport.

End-of-Life

ICL has recycling centres throughout Europe including Denmark, France, Sweden, the Netherlands, Finland and UK where, at its Byley, Cheshire centre it refurbishes and recycles equipment from the UK and provides product for ICL's Worldwide Spares operation.

1994/97 Targets

Where legal requirements exist, ICL will take back end-of-life equipment for recycling, reuse or refurbishing. Where such

requirements do not exist, ICL will offer to take back end-of-life equipment for recycling, reuse or refurbishing.

During 1994/97 ICL will seek to decrease by 1% overall of the total returns the amount of equipment which is committed to landfill by improving its recycling and refurbishing processes at Byley. This is dependent upon a similar mix of equipment being returned to Byley.

During 1994/97, ICL will work with its operating companies to obtain statistical information on the amount of used equipment which is recycled in its European operating companies.

ICL will ensure that all recycling organisations with whom it works follow best practice. During 1994/97 we will plan to audit them on an on-going basis and will begin the auditing process.

ICL will ensure that end-of-life equipment returned to its operating companies will be inspected and refurbished and used for spares.

B. ACCREDITATION AND AUDITING

ICL has pioneered a policy of conformance to standards in the IT industry, both technological standards like open systems, and business standards such as ISO 9000. ICL will extend this policy to the management and continuous improvement of environmental issues.

1994/97 Targets

ICL will seek accreditation for the appropriate national, European and international environmental management standards. ICL will implement a programme of internal environmental audits at three key UK sites during 1994/97. The process of preparing for internal auditing will also begin at selected European sites. In addition, external auditing will be carried out at two key UK manufacturing sites during 1994/97.

C. ICL'S SUPPLIERS

ICL has an accredited vendor scheme which has been in operation for some years. In the past ICL has encouraged and supported its vendors during their registration for BS5750, the Total Quality Management standard.

1994/97 Target

ICL will expect its accredited vendors to apply or be planning to apply for the appropriate environmental standards and consideration will be given to this in every purchase made by the Company. We will continue the dialogue with our suppliers concerning their own environmental policies.

D. ENERGY EFFICIENCY

ICL is a signatory of the Energy Efficiency Office's Declaration of Commitment which commits the Company to responsible energy management. ICL has energy management systems in operation at many sites throughout the UK.

1994/97 Targets

ICL will put in place all of the actions required by the Energy Efficiency Office's Declaration of Commitment.

ICL will aim to reduce its energy consumption in offices by 3% during 1994/97.

E. TRANSPORT AND COMMUNICATIONS

ICL already has a logistics policy which involves using the most environmentally conscious methods of moving product around the world. Its car fleet policy includes the mandatory use of unleaded petrol for all company cars and encourages the use of catalytic converters, diesel fuels and liquefied petroleum gas (LPG) engines.

ICL has long experience of using technology to help safeguard the environment. Since 1984, ICL has been building its own internal electronic mail network, thus reducing consumption of paper and energy

for transportation. Today it operates one of the world's largest X.400 networks providing a range of services to support the company's business communications needs.

ICL estimates that its video conferencing network saves the company more than one million passenger kilometres per year. The network comprises some 20 plus video conferencing studios in the UK, mainland Europe, North America and Japan. ICL has also pioneered the use of telecommuting to reduce the amount of employee miles travelled each year.

1994/97 Targets

During 1994/97 ICL will increase the number of vehicles in its worldwide fleet which are fitted with catalytic convertors, and will also increase the number of diesel vehicles in the fleet.

During 1994/97 ICL will seek to increase its use of video conferencing facilities by 20%.

F. ELIMINATION OF WASTE

ICL has already put in place waste elimination systems at many of its manufacturing plants and is monitoring waste at these plants and at its administration sites. It plans to extend both the formal systems and the monitoring activities.

1994/97 Targets

During 1994/97 ICL aims to reduce its use of virgin paper by 2%, and will encourage the increased use of recycled paper.

ICL's manufacturing operations in the UK and Europe will seek to reduce their water consumption by 5% during 1994/97.

G. RECYCLING OF CONSUMABLES

In many ICL sites throughout the world, with the support and co-operation of management, ICL staff have set up their own recycling schemes for used paper, cardboard, bottles, plastic cups, aluminium cans, batteries and office equipment consumables. Many sites have won local environmental awards and have also taken action to protect the local natural environment. In formally monitoring these activities, ICL will

also seek to encourage staff initiatives and enthusiasm for environmental protection.

1994/97 Targets

In 1994/97 ICL will aim to increase the amount of virgin paper and cardboard it recycles by 2%.

Most ICL sites throughout Europe now have plastic cup recycling schemes in place. In 1994/97 ICL will aim to recycle 30% of all plastic cups used in the UK and mainland Europe.

A formal process for recycling laser printer consumables has been in operation in the UK and Europe for some time. In 1994/97 ICL will seek to increase the number of laser printer units recycled by 5% and will also make this scheme available to its customers in the UK.

H. TRAINING AND AWARENESS

ICL has an excellent record for training both its own staff and its customers and holds a UK Government "Investing in People Award". ICL's training activities will be extended to include environmental management and awareness.

1994/97 Targets

Early in 1994 we formally launched our Corporate Environmental Policy to our staff, our suppliers and our customers. During 1994/97 ICL aims to extend its environmental staff training programme to reach all staff throughout Europe and will also introduce staff environmental action awards.

In 1994/97 we will also introduce a supplier awareness pack which will aim to support suppliers who are registering for the appropriate environmental management standards, and we will also offer practical advice and guidance to suppliers.

In 1994/97 ICL will support schemes to promote staff community action for the environment and will also encourage individual initiatives.

Annex 5 (cont'd): Target Information Gathering System

To: all Site Facility Managers
From: G.J.Collins LON1105
Corporate Affairs, WSR01
tel: 0181 788 7272 (Internal: 7221 2559)
fax: 0181 565 6671 (Internal: 7221 6671)

Measures for ICL Environmental Policy Targets

Dear all

The ICL Main board made a commitment some time ago to produce a Corporate Environmental Report. In order to roll-out the setup of procedures for gathering data for the Environmental Report I am contacting all remaining sites for which we do not receive data. The production of a Corporate Environmental Report is becoming increasingly important as ICL businesses are working towards accreditation to the Environmental Management Standard ISO 14001. Site facilities provide a key source of information to facilitate such objectives.

The process in place is mandatory because it needs to be auditable but we have tried to make it as user friendly as possible. Office power is the Corporate Information System we are using and UDAPs ensure an auditable process with the least difficulty for everyone.

I need data on two matters:

- Energy consumption (Electricity, Gas, Oil)
- Recycling processes:

. Paper	Amount bought-Amount recycled
. Plastic cups	Amount bought-Amount recycled
. Printer consumables	Amount sent for recycling
. Cardboard	Amount sent for recycling
. Aluminium cans	Amount sent for recycling

To be valuable the data must be in a specified unit:

- electricity	kwh
- gas	kwh
- oil	litre
- paper	Kg
- plastic cups	Kg
- Printer consumables	unit
- Cardboard	Kg
- Cans	Kg

Please refer to attachment 2 for further details.

I aim to collect back-dated figures to 1996. If you are not logging one or several of these figures, please set up a process to start logging and being able to provide them. I have set up one collection every quarter with those sites already in progress.

I thank you in advance for your cooperation and please do not hesitate to contact me should you need any further help.

Kind Regards
Gail Collins

Description:

You have received the 4 following attachments:

- Attached 2: The present installation notice
- Attached 3: The OP form for the UDAP database
- Attached 4: The User Defined Key to log into the UDAP
- Attached 5: The User Defined Key to send the record to me

They are tools to log and send to us the measures we need to monitor our progress towards the ICL Environmental commitments.

Installation:

The installation will take about 5 minutes. Please follow the milestones:

1. extract Attachment 3 calling it:

Owner: (username ex: js for John Smith)

Folder: forms.....

sites..... (please use lowercases)

.....

.....

2. extract Attachment 4 calling it:

Owner: (username ex: js for John Smith)

Folder: udk.....

1Elog.....

.....

.....

3. extract Attachment 5 calling it:

Owner: (username ex: js for John Smith)

Folder: udk.....

1Dsend.....

.....

.....

for milestone 2 and 3, 1D and 1E define the location the soft key will appear. If you already have soft keys in these locations, choose another location (1G or 2D for instance)

4. log for the first time in the UDAP to create the datafile
 - . press Ctrl-F12, then the key login should appear
 - . press the key
 - . accept the creation of the datafile.

Using it

When you want to log some figures, what ever you are currently doing with OP,

- . you log into the UDAP (Ctrl-F12 and press the login key),
- . you log the figures (TAB key to move between fields),
- . you accept the record,

If you want to send 1 or several records,

- . log into the UDAP,
- . mark the records, press F10 (Marked Set key) (not necessary for only 1 record),
- . use the udkey (Ctrl-F12, press Send key),
- . type a message if wanted,
- . press F3 to send.

If you need extra info, want to submit any comment, or meet problems going through the installation or using the UDAP, please contact me.

Thank you.

G.J.Collins (lon1105)
Corporate Affairs, WSR01

User Defined Application (Form for datafile)

ICL Environmental Affairs Unit

Measure collection Name: Site:
ICL Site Information Period from: to:

ENERGY CONSUMPTION

Oil: Litres
Electricity: KWHrs
Gas: KWHrs

RECYCLING PROCESSES

Paper: bought: Kg Recycled: KG
Plastic cups: bought: Kg Recycled: KG
Printer consumables: Recycled: Units
Cardboard: Recycled: KG
Cans: Recycled: KG

Report Number 3

Annex 6

Annex 6: ISO 14001 Legislative Procedures

TITLE: Procedure for Environmental Legislation Notification

AUTHOR: Gail Collins

DOCUMENT STATUS: Draft

SUMMARY: This document defines the procedure for identifying relevant environmental legislation changes and the distribution via bulletins to the ICL businesses.

AUTHORISED BY:

Title	Name	Signature	Date.
Process Owner and Corporate Environmental Affairs Manager	Joy Boyce

DISTRIBUTION:

Issue	Date	Reason for change
0A		First draft for comment

7. DOCUMENT CONTROL

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7.2 Changes from previous issue

This is the second draft issue of the document

7.3 Referenced documents

The following documents are referred to in the text thus, [n], or are associated with this document.

[1] The Register of Environmental Regulations

7.4 Change Control

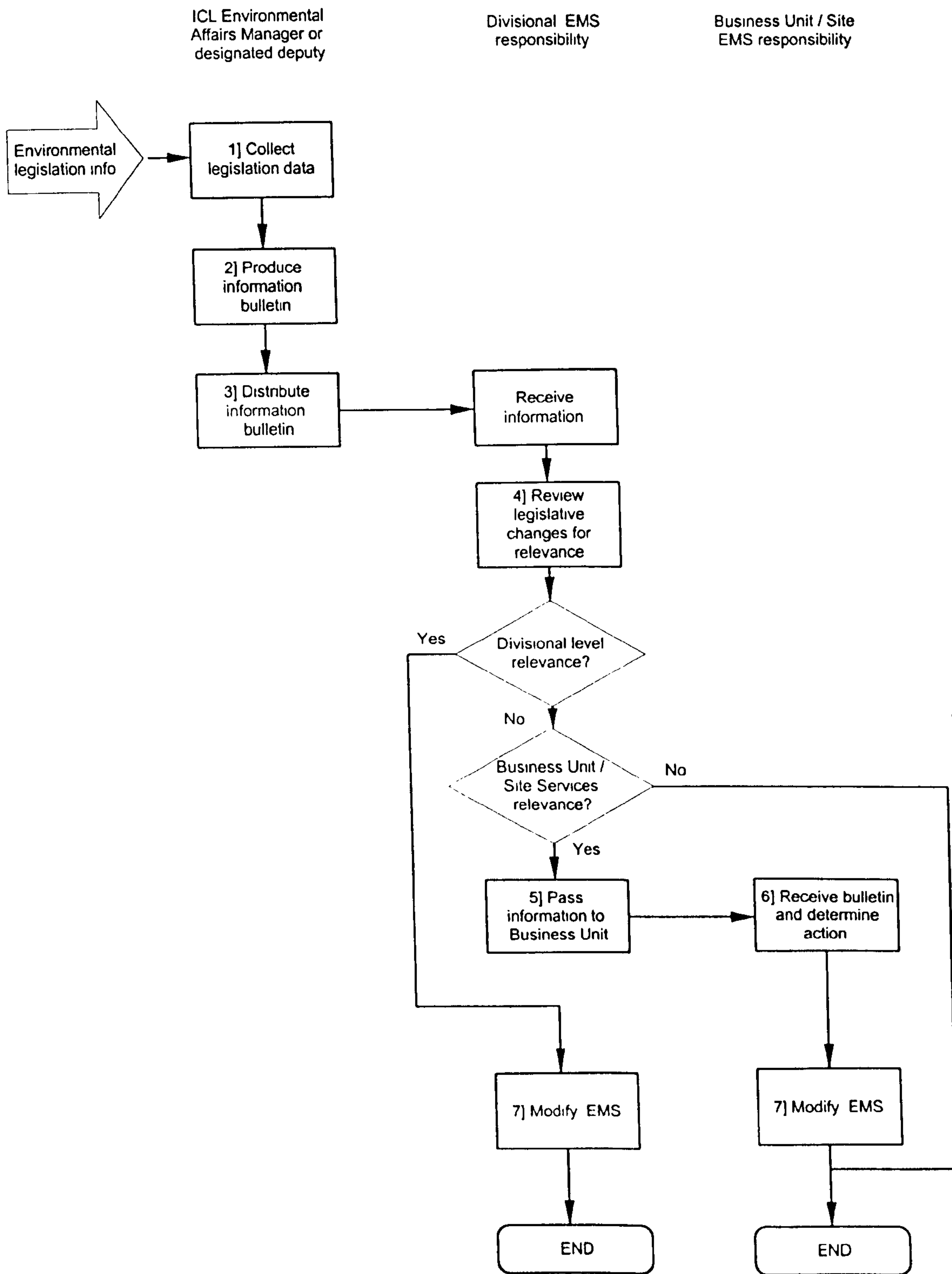
This document is subject to the change control process applicable to Procedures.

8. INTRODUCTION

ISO14001 requires that the management system ensures the identification and swift implementation of any necessary changes resulting from such legislative change. This procedure describes the identification and distribution process for national legislative change likely to affect ICL Environmental Management Systems. In order to satisfy the ISO 14001 requirement that companies have access to all the applicable legislation, a Register of Regulations has been compiled [1].

It is the responsibility of the ICL Businesses and Site Facilities Management to keep informed of local legislation changes which may also be relevant.

9. FLOWCHART



10. PROCESS DESCRIPTION

Ref	Explanation	Records	Work Instruction
1	Environmental Affairs regularly scans sources as appendix A for legislative change likely to impact ICL		
2	Environmental Affairs create legislation information bulletin.	Bulletin	Bulletin Creation
3	Environmental Affairs distributes bulletin to specified distribution list via appropriate media.	Distribution record	Distribution list
4	Business Division reviews legislative bulletin to determine action necessary. Contacting Environmental Affairs for guidance as necessary.		
5	The Business Division may opt to either filter the legislation and forward only that considered necessary to all relevant business units or distribute to all designated recipients within the Division		
6	Business Units receive bulletin and determine any necessary action, taking advice from local expertise or from Corporate Environmental Affairs		
7	Update if necessary the relevant documentation and take action as prescribed within local Environmental Management System	Change controls for EMS	

APPENDIX A sources of information for legislative change

Legislative Update Documentation:

Croners

Environmental Management Case Law

Waste Management

Environmental Management

European Directives

Draft Directives - Electronics End-of-Life

- Batteries

Agra Europe

European Packaging and Waste Law

Perchards

Packaging Legislation in Europe

Producer Responsibility for End-of-Life Products in Europe

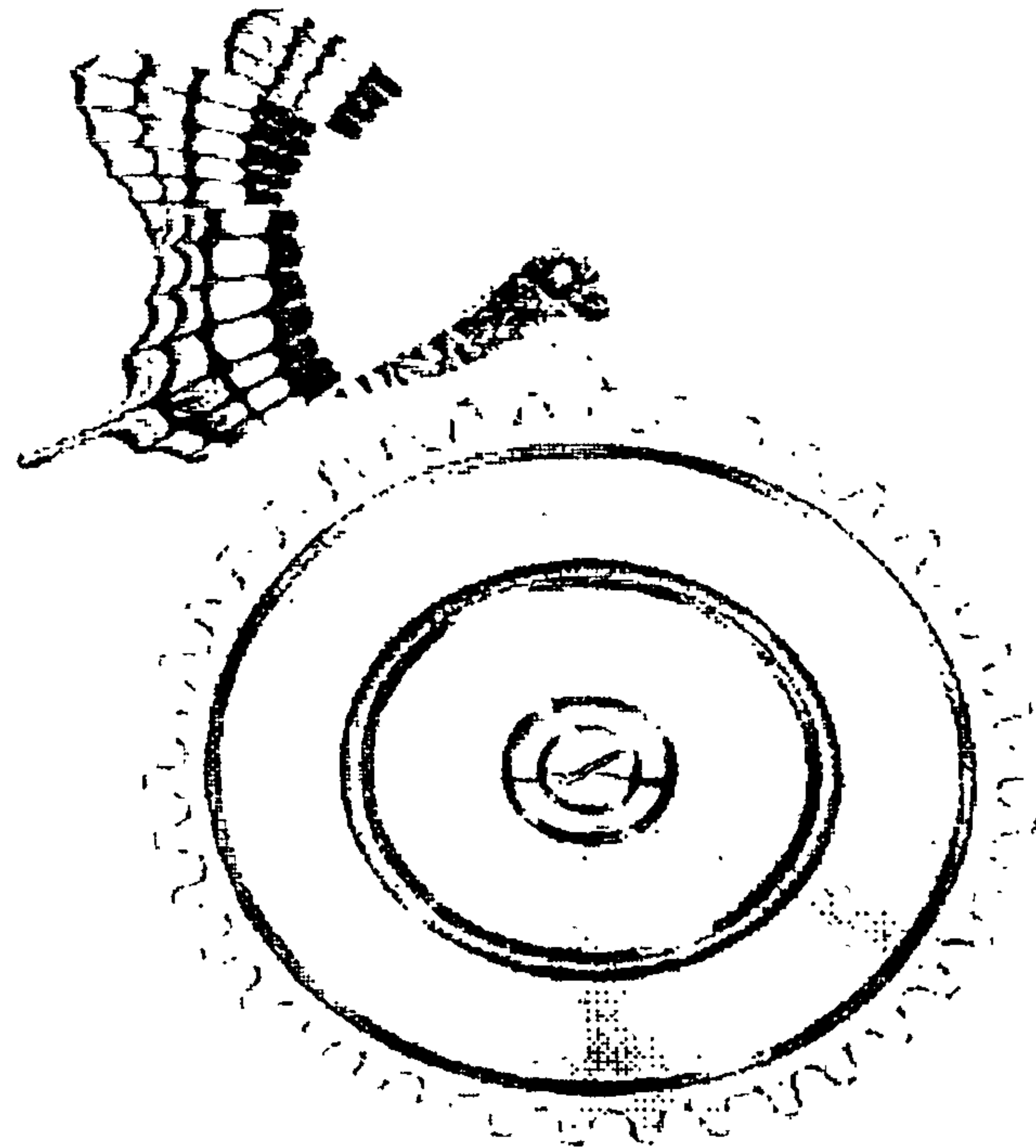
UK Government Environmental Legislation Publications

Consultation Papers

Draft Regulations

Report Number 4

**Brunel and Surrey Universities' Engineering Doctorate in
Environmental Technology**



**“Environmental Information Systems for a
Multinational Computer Company”**

Year Two Dissertation

Gail Collins

Second Year Research Engineer

Dr. Sue Grimes

Academic Supervisor

Centre for Environmental Research

Brunel University

Joy Boyce

Industrial Supervisor

Corporate Environmental Affairs Manager

ICL (International Computers Limited)

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1.0 Overview

The project was set up in 1996 to look at the environmental information requirements of a multinational computers company at ICL plc. At that time, ICL was a manufacturing organisation and the company's policy and targets reflected this. The manufacturing arm of ICL was sold to Celestica, a Canadian company, in March 1997. ICL is now a systems and services organisation which assembles and services hardware product but does not manufacture. When Celestica purchased the manufacturing business (Design to Distribution, D2D) its decision was influenced by the fact that D2D had a high profile environmentally including being the first electronics manufacturer to achieve BS7750, EMAS and ISO 14001. With the sale of its manufacturing arm ICL lost its ISO 14001 and EMAS certification. IN 1997 ICL began new projects working towards ISO 14001 but due to organisational changes is having to restart the programme in a different division. ICL's parent company, Fujitsu, has been undergoing an ISO 14001 implementation programme and as such this has exerted pressure on ICL to obtain certification. In addition, ICL is increasingly receiving questions on ISO 14001 within bid documents and Invitations to Tender (ITTs).

ICL subscribes to the European Quality Model (EQM) as devised by the European Foundation for Quality Management (EFQM). The process can be used to assess the overall performance of an organisation, including aspects such as leadership, people management, policy and strategy, resources and processes, and the non-financial results of people satisfaction, customer satisfaction, and impact on society. The inclusion of impact on society which covers environmental as well as social issues (although it accounts for only six per cent of the total marks in assessing an organisation's quality performance) forces companies to focus on the issue. It is ICL's approach, and it is not alone, that the environment should be dealt with across the whole model as well as impact on society.

The Corporate Environmental Targets had been set for the period 1994-7 and, although they have been allowed to run for 1998, they are currently under review. Several factors have held up the development of new targets, the main factor being the increasing legislation from Europe and the need to accurately reflect these requirements in the targets. The relevance of the targets has also been affected by organisational changes such as the sale of the manufacturing arm. Similarly, ICL's plans to produce an environmental report in 1996 had to be off-lined and is high on the agenda for 1999. Environment Minister Michael Meacher has stated that "a clear majority" of those involved in the consultation process believed that compulsion would be needed to achieve a big increase in corporate environmental reporting (ENDS, 1998a). This has highlighted the need for environmental performance measures for reporting purposes.

The information requirements of the UK Government's Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 are extensive and demand the development of information systems that have not previously held this type of information. The processes that have been set up in order for ICL to comply with the legislation have paved the way for meeting future, similarly information intensive, UK environmental regulations which are expected to follow. Such regulations will be enforced by the European Parliament and will include the Waste Electronics and Electrical Equipment (WEEE) Directive, presently at second draft stage, and the Integrated Product Policy (IPP), a Green Paper on which is expected by the end of this year (Environment Watch, 1998a).

2. Abstract

This dissertation marks a milestone in the development of this project in that it includes research into the importance of performance indicators in achieving real environmental improvement in the increasingly regulated area of organisational environmental management. One of the research aims is to develop an information infrastructure that encompasses both the legislative information requirements and the overall environmental performance of the company. The first two years of the research have investigated the environmental information requirements of, and flows within, a multinational information technology business. The information requirements of the UK Government's Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 have been assessed and appropriate systems have been devised. Alongside this, a waste measurement and sampling strategy was developed and various waste audits carried out in order to assess ICL's major waste streams and the implications for recycling and recovery of packaging waste. The progressive effects of the UK packaging waste regulations on a company's environmental performance are being tracked. The organisational issues which surround the management of environmental information have highlighted the importance of supply chain management and environmental reporting.

In order to maintain ISO 14001 certification year on year, and thereby protect the investment involved, a company needs to be able to demonstrate continuous improvement. For the next two years, a key part of the intellectual focus for this research project is to develop environmental performance indicators that will support continuous improvement programmes within an Environmental Management System (EMS). Normalisation techniques will be formulated whereby a large, multi-national organisation can assess its environmental impact irrespective of its growth/ downsizing and in all territories worldwide. These performance indicators will be developed on both a short and longer term basis in order to incorporate projections such as sustainability. The effectiveness of the performance indicators for the organisation's ability to demonstrate continuous improvement for the purposes of ISO 14001 certification are to be assessed. In addition, the environmental performance indicators will be evaluated for their effect on the environmental reporting capacity of the organisation and the effects on stakeholders.

3.0 Summary

3.1 Aim:

To establish an infrastructure for the management of corporate environmental information within a multinational information technology business, using ICL plc. as an example.

3.2 Objectives:

1. To review the environmental information flows within, and the environmental information requirements of, a multinational information technology business.
2. To review the impacts of current and future environmental legislation on the information requirements of a multinational information technology business. To assess the impacts of legislation, with emphasis on the UK packaging regulations, on a multinational organisation's environmental performance. To establish communication channels down the supply chain in order to improve the accuracy of packaging information necessary for legal compliance and to stimulate environmental innovations through supplier agreements.
3. To design, develop and implement a system for ICL to meet the environmental information requirements reviewed with particular emphasis on legislative demands. To evaluate the effectiveness of such a system and to recommend any future improvements. To facilitate the use of ICL's existing information systems, and to develop new ones where required, to meet the information needs.
4. To apply the current knowledge on environment-related performance measurement to ICL's information needs to ensure the organisation has the necessary measures, compatible with ISO 14031, with which to meet its Corporate Policy and Targets. To develop appropriate relative and normalisation techniques to performance measurement within ICL.
5. To integrate such environmental performance measurement into the process of ISO14001 implementation within the company. To ensure that such measures enable the organisation to track its environmental performance and demonstrate continuous improvement programmes for the purpose of maintaining ISO 14001 year on year. To ensure that ISO 14001 is embedded into business processes and that the performance measures reflect this.

3.3 Contributions to Knowledge

1. A critical evaluation of the impacts of legislation, particularly the UK packaging regulations, on environmental information management and environmental performance within a multinational information technology business.
2. A practical system, compatible with ISO 14031, for the use of environmental performance measurement within ISO 14001 implementation that allows a multinational company to track and demonstrate continuous improvement year on year.
3. Normalisation techniques and relative performance indicator development specifically for use in a multi-national, service based, information technology business.

3.4 Methodological Approaches Used / to be Used

- Track environmental legislation through relevant current literature studies. Apply this to the information requirements on ICL and take a proactive approach to developing the necessary information infrastructure within the organisation. Examine the impacts of the legislation on environmental initiatives at a site-specific level through active participation in compliance projects at the corporate level.
- Work with an ICL information technology business consultant on developing existing information systems to incorporate environmental information required by legislation. Develop a process to project ICL's packaging obligations and recycling for year end. To utilise ICL software designers in the development of any software necessary for environmental information management and decision-making processes.
- Work with ICL procurement staff to facilitate the inclusion of packaging information requirements in contracts and to open dialogue with suppliers whereby environmental innovations such as reuse cycles can be established
- Benchmark ICL's environmental reporting capability against others within the IT industry to assess the performance measurement needs. Carry out a study of the literature on environmental performance measurement and applications of theory to practice, i.e. case study material
- Design and develop environmental performance measures, applying best practice and life cycle based approaches, that are compatible with ISO 14031, and in line with the company's corporate environmental policy and targets for 1999.
- Create generic EMS documentation to facilitate and support ISO 14001 implementation, by ICL businesses, through the creation of processes and procedures whereby the performance indicators can be measured. Introduce the measures alongside ISO 14001 implementation, i.e. by business unit. Interact closely with the business concerned to adapt the measures as required. Interact with ISO 14001 steering groups by organising and participating in meetings. These meetings will act as an information exchange mechanism and a source of data for the research.
- Once the measures have been developed to a satisfactory level, roll them out to other ICL businesses, within the ISO 14001 programme, and adapt them to the businesses as necessary. Monitor performance measurement results to assess whether they meet the target progress requirements over time.

3.5 Titles (provisional) and Target Refereed Journals for Two Papers for Submission

“The Impacts of the UK Packaging Regulations on Environmental Performance and the Development of Waste Measurement Sampling - A Practical Approach Within the IT Industry.” Journal of Environmental Management

“Using Environmental Performance Measures in ISO 14001 for Continuous Improvement in the IT Industry” Environmental Quality Management

4.0 Literature Review

This section will discuss the current issues in relation to environmental performance, ISO 14001, performance indicators and measures, information management and environmental reporting. These issues have formed the basis of the project, as outlined in the summary, and will be examined as follows:

- The need for an information infrastructure within an organisation for the purposes of environmental management, as with any management system, and the increasing information demands of policy-makers which demand the improvement of environmental information flow down supply chains.
- The fact that ISO 14001 certification is considered to be weak in ensuring that the management system provides for environmental performance improvements and the resultant need for organisations to expand their EMS and make it more rigorous and integrated fully into all business processes.
- The requirement for environmental performance indicators/ measures, including normalisation techniques, to ensure the verification of continuous improvement within the management system.
- The prospect corporate environmental reporting becoming mandatory and the incompatibility between the drive for standardisation of performance measures and the differing priorities of stakeholders.

4.1 Information Infrastructure for Environmental Management

One example of the value of information management in the literature, although focusing on the financial aspects of environmental management, is written by Shaltegger and Sturm (1996). They outline their 'Basel Concept' of managerial eco-control and state that it corresponds to methods of financial and strategic control and can be divided into these five sections:

1. Goal and policy formulation
2. Information management
3. Decision support
4. Piloting and implementation
5. Internal and external communication

They state that the information management system is the foundation of any environmental management system and that measurement is commonly critical to effective management. They also point out the fact that environmental information needs to be assessed critically for its relevance and significance. Another crucial point made is that data collection is usually developed over several years, digging deeper each year until the marginal benefit of more detailed information matches the marginal costs of collection. One feature of environmental information gathering exercises in any situation is that the result can be a data rich organisation that is information poor. A lot of time and resources can be spent collecting information, only to find that it is inadequate when trying to make environmental management

decisions. A framework for information should, therefore, provide a link between existing environment- related data to policy and management needs. In addition, it should identify duplication and gaps in existing information collection efforts, and provide an impetus for the development of new data and indicators to fill the gaps.

The application of information systems to environmental management is becoming increasingly common. An example of this is described in a paper on information systems accounting and performance measurement (Rikhardsson, 1996). The objectives of such a system being:

- To consolidate environmental performance information across the organisation
- To disseminate information to the relevant managers/ employees
- To achieve cost-effective reporting capability

Two problem areas identified in utilising information systems for the management of environmental information are in the variety of units and of data collection timing. The software used needs to accommodate these variations. The paper outlines the different types of environmental information system packages to include:

- Mass-flow software - both eco-controlling and eco-balancing approaches
- Life-cycle assessment software
- Environmental cost assessment software
- Modelling software - including GIS
- Health and safety software
- EMS implementation software
- Knowledge databases - including legislation and substances
- Integrated modular software - combinations of two or more of the above

In a paper's discussion of integrated information management, the essential features of a supporting database are described to include reliable data quality, security backups and data archives, integration (in terms of data comparability and technical compatibility), accessible, user-friendly, analytical tools, comprehensive, and compatibility with other systems (Lane, 1997). Data reliability is possibly one of the most important areas within organisational environmental information management and principles of quality management and associated standards should be applied to any information infrastructure that is developed. The quality objectives should be based on identified quality criterion such as the level of accuracy, completeness, sources and timing. Quality assurance processes on the data should be set up to monitor the objectives via data validation (screening for "unacceptable values") and checking of collection methods. BT has a data quality assurance process as part of its environmental management system whereby the environmental data sent in to the corporate environmental department from the different sites/ business sectors is sent back to be checked and resent by the individual units responsible for the measures. BT is quite advanced in its EMS development and most companies appear not to use information systems for environmental management purposes until relatively late in their environmental programmes even though, in theory, this is the wrong way round. The reasons for this could be a combination of insufficient planning, lack of resources, and a lack of guidance on the information requirements and management methods from the outset.

One of the major drivers for organisations to develop information systems for the management of environmental information is legislation. As legislative policy-makers are increasingly moving towards a holistic approach that aims to encompass the whole life cycle of products, increasing demands are made on organisations to provide environmental information. This 'policy-mapping' of the whole life cycle puts pressure on organisations to provide environmental information about both the products that they are responsible for producing and those products that they use within their production processes (Nicholas, 1998). 'Producer Responsibility' legislation is directed at the waste management end of the life cycle, and ensures that all members of the supply chain are responsible. An example of this is the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 that affect not only the manufacturers of packaging but those who utilise packaging for the distribution of their products. This and similar legislation, however, has specific implications for supply chain management in terms of the exchange of environmental information and general co-operation down supply chains. The ambitious Dutch policy on Integrated Chain Management (ICM) is discussed in a paper that examines business trends in supply chain management and Total Quality Management and outlines four policy measures to support ICM (Wolters et al., 1997). The paper states that:

"ICM considers the entire material cycle from cradle to grave - in one sense it is the organisational implementation of life cycle analysis (LCA).....ICM can be more environmentally optimal than the sum of the separate activities within an un-integrated chain."

The paper states that supply chains are becoming more integrated with an increase in the exchange of information between them. However, the flow of environmental-related, compared to business, information down the supply chain is poor due to the fact that it is a relatively new area and that businesses will not invest in information collection systems unless it is absolutely necessary. It is conceivable that policies involving the requirements for information on the overall environmental effects of products would be a major driver of ICM and the expected EU's Integrated Product Policy (IPP) is one such policy (Environment Watch, 1998a). In a paper by Schalteggar (1997) on the economics of Life Cycle Assessment (LCA) he outlines the quality relative to the costs of LCA information down the supply chain and illustrates this by the following diagram (see figure 1.):

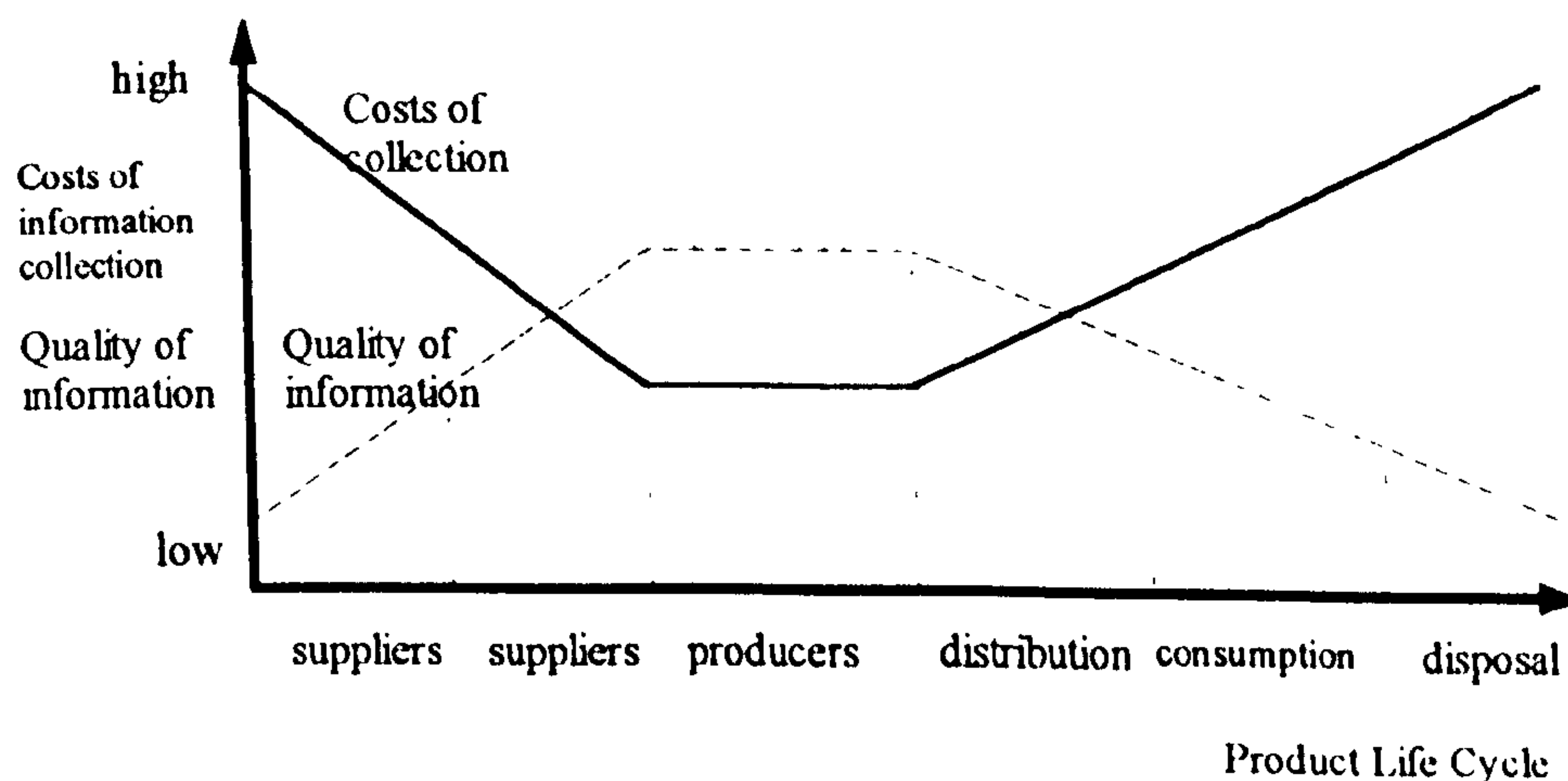


Figure 1: Reliability, quality, completeness, representivity and accuracy of information in an LCA (Schalteggar, 1997)

Such a diagram may be applied to environmental-related information in general and highlights the cost and risk implications of not developing the necessary channels of communication and management processes. The development of data collection systems, and environmental information management processes overall, is becoming increasingly important for organisations to manage their environmental performance, implement EMSs and produce environmental reports to satisfy their stakeholders.

4.2 ISO 14001 and Environmental Performance

The number of companies certified to the International Organisation for Standardisation's ISO14001 is increasing rapidly (ENDs, 1998b). Over the six months between April and September 1998, the number of companies certified doubled (Environmental Risk Manager, 1998). The previous referenced article describes the drivers for implementing ISO14001, as defined by Mark Barthel, of the British Standards Institution. In brief they are:

1. Cost savings achieved through reduction in resource consumption and waste reduction through direct action or via process alterations.
2. Identification and employment of cleaner technologies in manufacturing
3. Improvement of regulatory compliance and reduction of associated costs
4. Improved access to external ethical/ environmental investment funding and internal corporate funding
5. Access to investment finance for infrastructure projects (both the European Bank for Reconstruction and Development and the World Bank now recognise ISO 14001);
6. Achieving competitive edge by getting ahead of the competition and meeting supply chain requirements for ISO 14001. A growing number of major procurers are insisting that their suppliers adopt ISO 14001 in order to continue doing business with them
7. Acting in a proactive manner to minimise exposure to environmental liabilities, thereby improving the insurance policy conditions and obtaining reduced insurance premiums

ISO 14001's concept of an EMS has resulted in what has been regarded as a fundamental change in business and management principles. The main elements of which, top management commitment to the environment, a systematic integration of environmental issues into the decision-making process of an organisation, and the re-engineering of governmental and business systems, taken together, may drive future economic powers (Watson, 1996).

However, despite these very clear advantages to both businesses, government and the environment as a whole, there have been many critiques of the standard. Most notably the issue of the misinterpretation of the purpose of "standardisation" as opposed to "standard". ISO 14001, is a management framework that is intended to harmonise existing EMSs, not to provide a minimum standard of environmental performance. Performance measurement within the standard is concentrated on the system:

“measurable results of the environmental management system, relating to an organisations control of the environmental aspects of its activities, products, or services, based on its environmental policy, objectives and targets.”

A company must therefore take responsibility for improving its environmental performance as the certification bodies will only be obligated to assess the performance of the system according to Glekman and Krut (1996). They argue that the ISO 14000 series will reverse the trend of industry leaders experimenting with innovative ways to create global environmental performance standards because it will grant an ‘easy A’ to companies with the certification even if they have low environmental performance. It remains to be seen as to whether this is in fact happening but companies should perhaps be wary of rely on ISO 14001 certification as representing their own, or their suppliers, environmental performance standards.

Glekman and Krut also argue in this article that the issues of Agenda 21, as supposedly the basis of the standard’s ideology, are so diluted as to be unrecognisable and quotes (from the standard):

“It should be noted that this standard does not establish absolute requirements for environmental performance beyond commitment, in the policy, to compliance with applicable legislation and regulations and to continual improvement.”

They also state that the standard does not require any public reporting to be made, unlike the European Union’s eco-management and audit scheme (EMAS), which would increase the pressure on the organisation to improve its environmental performance. This again is out of step with Agenda 21 which established a public ‘right to know’ and recommends public environmental reporting.

The article goes on to emphasise the business argument for performance-oriented management systems. This basically states that effectiveness should be the focus rather than efficiency, because efficiency focuses on the means rather than the ends, i.e. could be heading nowhere well. Effectiveness, however, focuses on the aim of the organisation, such as sustainable business practice, to which the efficiency of how to achieve it is complimentary:

“...becoming more effective will lead an organisation to become more efficient, but that the reverse is not true. Although ISO 14001 requires companies to state an environmental policy giving its environmental intentions and principle, it offers no mandate to incorporate sustainable development aims-or, for that matter-any other environmental limit values, into the policy.”

The fact that EMAS is arguably more effective in the sense that it drives the improvement of environmental performance is being undermined by the international standard. The uptake of EMAS has trailed off in recent months (ENDS, 1998b). It has been noted that the EU’s proposed changes to EMAS, to address its apparently decreasing popularity, could weaken the scheme. The proposals include a ‘relaxation of environmental controls’ by member states on businesses that sign up (since EMAS requires compliance to all relevant legislation). The EMAS revision proposals have been criticised for failing to create incentives for improving performance by the European Environmental Bureau (EEB). The EEB argued that EMAS would only survive if it is “ecologically more demanding” than the international standards and that requirements for participation in the scheme should include the benchmarking of

environmental performance and the application of clean technology. The scheme is moving closer to ISO 14001 in that it will be expanded to cover service and public sector organisations instead of being limited to industrial companies. Fortunately, it will still maintain the requirement for organisations to commit to continual improvement in their environmental performance, comply with environmental legislation and publish an environmental statement on their environmental impact and performance annually. The improvements to EMAS proposed are that the statement will have to be produced annually instead of every three years, organisations will have to involve employees in implementation, and that the significant environmental impacts associated with procurement policies should be addressed (Business and the Environment 1998d & e, ENDS 1998c).

So what drives an organisation to improve its environmental performance and go beyond the ISO 14001 certification stamp? The answer to this seems to lie in the fact that the leaders in the field of environmental best practise companies have realised that environmental protection is a key issue that will more and more affect their competitive edge and ultimately their bottom line. Other drivers include attracting investment, the pressure of environmental regulation expansion to cover products as well as production processes, the pressure from consumers and the supply chain to provide goods and services at decreasing environmental cost, and the pressure from environmental groups and associated media influence on regulators (Steger, U., 1996).

Meeting these demands is not just about improving environmental performance, as an article in Environment Business Magazine (1997) argues, but about being seen to do so:

“...sites used to logging and publishing the minutiae of environmental information are under no particular pressure from their well informed customers.”

Therefore, environmental reporting capability is a crucial part of meeting the demands for improved environmental performance. Although the article states that ISO 14001 certification unequivocally achieves this, many believe, as argued earlier, that this is not so. In fact, within the article is an example of this from Baxter's Renal Division facilities:

“Baxter is seeking certification against both the standard and its own corporate requirements, an approach which not only helps to keep environmental costs under control but also highlights any disparities between internal and external priorities. The ultimate aim is that in merging the standards we go one step beyond the existing system and demonstrate this to our external audiences.”

Another example of a company recognising the need to go beyond ISO 14001 is that of Ontario Hydro:

“... it was also recognised that the ISO 14001 standard did not include all the components that were part of the corporate environmental management system. To address this concern, Ontario Hydro enhanced its corporate environmental management system by following the ISO 14001 standard format while at the same time extending the standard by changing terminology and adding new sub-elements.” (Stoesser, 1996)

The sub-elements the article describes address the companies main aim towards sustainable business practice and the mechanisms in place to achieve this. It goes on to list what I would suggest are essentially drivers of environmental performance improvement:

- environmental reporting
- continued senior management commitment
- the focus on environmental impacts
- accountability (such as performance contracts)
- funding for environmental decision-making
- rewards and recognition
- auditing for the purposes of environmental issues management, carrying out corrective actions

Recent developments imply that the limitations of ISO 14001 are going to be addressed. The Multi-State Working Group (MSWG) on environmental management systems has prepared a draft “statement of consideration” that addresses the perceived weaknesses of ISO14001. These weaknesses are said to arise from the language used, in the areas of communications and reporting, compliance and pollution prevention. It has been recognised that under the existing standard, organisations can certify to ISO 14001 without necessarily improving their environmental performance and argues that:

“the inclusion of a specification requiring an environmental statement relating to setting goals and reporting performance within the context of an organisation’s EMS would strengthen links with interested parties and benefit all users of the standard ”

It also addresses the credibility problem of the standard only requiring “commitment to compliance” by proposing that compliance with the law be regularly recorded. The group argues that these revisions would improve an external auditor’s understanding of the organisation’s EMS and change the relationships between organisations and regulators (Business and the Environment, 1998e).

4.3 Performance Indicators for Continuous Improvement

In order for a company to manage its environmental performance it needs to be able to identify and measure its environmental impacts. Such measures enable an organisation to meet the increasing demands on them to provide information on their environmental performance. As a result, environmental performance indicators (EPIs) are increasingly being used by organisations and research is focusing on them.

The European Green Table report (1997) defines the benefits of environmental performance measurement as follows:

- Provides the management with concise and quantifiable environmental information
- Improves the basis for companies’ environmental policy objective and targets
- Improves the basis for companies’ internal and external environmental reporting as well as communication regarding environmental issues
- Enables companies to define their significant environmental aspects and describe and measure their environmental performance.

- Enables companies to focus on and demonstrate continual improvement of environmental performance
- Serves as a useful tool for those aiming at certification to ISO 14001 and EMAS
- Enables companies to complement existing environmental performance scopes by including developments of indicators for Health and Safety
- Improves the basis for internal and external benchmarking

The guidelines on Environmental Performance Evaluation (EPE), ISO 14031 are being prepared for organisations that are “seeking ways to understand, improve and demonstrate sound environmental performance”(ISO 14031). The standard is expected to be published by the second quarter of 1999 and is especially complimentary to ISO14001 in its description of the beneficial applications of EPE:

- achieve continual improvement of environmental performance,
- report and communicate its environmental performance
- identify opportunities for prevention of pollution
- increase efficiency and effectiveness; and
- identify strategic business opportunities

Within an EMS, the continuous improvement cycle is dependant on the commitment of the organisation’s staff. A recent study, carried out by extensive writers on the subject of environmental performance measurement, Bennett and James (1998a), identified that the main audiences, as a driver for performance measurement, are internal ones. It makes sense that a company wishing to strengthen internal commitment to environmental improvement looks to influence its managers and employees generally and to provide them with the necessary tools.

EPIs can be used to demonstrate continuous improvement for the purposes of ISO 14001 certification. The value of EPIs in protecting a company’s investment in ISO 14001 year on year is clear. The methods by which a company achieves this is not so clear or so well documented. An environmental performance measurement framework (EPMF) has been described (Azzone et al., 1996a) and been refined more recently by William Young and Welford (1998). The framework is based on environmental performance measurement within the organisation and covers the three main areas of environmental policy, environmental management system, and processes, products and services. It does not, however, address the specific impacts unique to a particular organisation and takes the approach of selecting indicators according to type.

The literature has many different categorisations of performance indicators, but ISO 14031 separates them into three basic categories:

- Environmental condition indicators - includes sustainability, receptor and proxy/ risk
- Operational environmental performance indicators - includes facilities and equipment, resource consumption of processes, and logistics
- Management environmental performance indicators - includes stakeholders/ financial, implementation and conformity

The standard defines five kinds of quantitative measures for EPIs.

- Direct measures - basic data or information
- Relative data - data or information related to another parameter
- Normalised data - data or information converted to units or to a form which relates the information to a given standard or baseline
- Aggregated - data or information of the same type, from different sources, collected and expressed as a combined value
- Weighted - data or information modified by applying a factor relating to its significance

The manipulation of data in different ways requires caution. Relative indicators are complimentary to absolute and not a substitute. Aggregate indicators can show crude progress over time, and a lot of time can be spent explaining (irrelevant) fluctuations. Weighted indicators require discussions on value judgements which can be productive in raising awareness but a consensus is difficult to reach. Normalised indicators relate absolute or relative measures to a defined baseline. Dow Europe has developed a normalised methodology - known as an 'eco-compass' with which to compare different products (Fussler and James, 1996). This is unusual because normalised indicators are normally used to express changes in emission levels against a baseline year. The basic structure is designed on a life cycle basis and is shaped as a hexagon. The six poles of the hexagon represent health and environmental potential risk, resource conservation, energy intensity, revalorization (remanufacturing, reuse and recycling), and service extension. The eco-compass can be used for comparisons between products. The scoring is on a 1-5 scale and is based on the environmental impact to deliver a standard unit of service. The base case, usually an existing product, is scored as 2. New products only receive a score of 5 if they improve by >300%. This is based on the four-fold level believed to be the minimum required for true sustainability by a number of environmental thinkers (von Weizsacker, Lovins and Lovins, 1997). Dow uses the tool to identify and evaluate improvement projects and identify innovations towards sustainable business practice.

4.4 Performance Measures and the Stakeholder

Although corporate environmental reporting is not yet mandatory, there is an increasing amount of legislation that requires companies to provide environmental information relating to their business and often their environmental performance. There are strong arguments for mandatory reporting, as most people accept that society has the right to know about industries' impact on the environment and that some companies will not report on a voluntary basis because they feel that it may have a negative impact on them. Many companies, especially those that are producing environmental reports, expect that reporting will become mandatory (Brophy and Starkey, 1996). It is certainly on the current government's agenda to make corporate environmental reporting mandatory and there are increasing demands from investors for companies to provide environmental information.

Bennett and James (1998a), however, do caution against mandatory reporting:

“Government and regulators have been key to the development of environment-related performance measurement and will remain so. However, there is an emerging consensus that traditional ‘command and control’ approaches need to be supplemented by more flexible, incentive-based mechanisms. Disclosure of environment-related data is one such mechanism.”

They go on to suggest that mandatory reporting could use what they call a ‘laser’ as opposed to a ‘light bulb’ approach, where a smaller amount of information would be selected and looked at more intensely, because it might be a more effective way to drive improvement. The main argument commonly used by supporters of voluntary environmental reporting is that businesses do not need government intervention because they will meet the requirements of their stakeholders (Maltby, 1997). Currently then, the main driver for environmental reporting is generally considered to be the improvement of stakeholder relations. The term stakeholder has been extended, through TQEM (Total Quality and Environment Management), beyond customers as purchasers of goods and services to include users of business outputs in the wider sense, such as staff, shareholders, regulators, communities, environmental groups and the general public. Two beneficial effects of environmental reporting are advances in environmental management strategy and internal commitment to improving environmental performance (ENDS 1998d).

In a study, reported in ENDS (1998e), carried out by the UN Environment Programme (UNEP) and the consultancy SustainAbility, the barriers to producing environmental reports were explored. The four main areas identified were gathering data, absence of a standard set of indicators, lack of resources, and a lack of management interest. The lack of confidence in these areas in non-reporting organisations when compared to reporting organisations is discussed in the article and it is suggested to be unfounded. I would argue that the lack of comprehensive guidance on the development of performance measures may be the reason. In addition, the article emphasises the pressure from the financial sector for companies to provide environmental information and quotes an analyst’s comment from the report:

“When financial analysts look at the environmental record of companies they tend to downgrade those that don’t keep up with the pack - lack of disclosure could be read as a dinosaur indicator. This doesn’t say much for a company’s management”

It is now well accepted that there is a relationship between environmental and financial performance within a company and that investors are incorporating environmental considerations into their decision-making processes. Baxter International Inc. produces environmental financial statements as part of its drive to create ‘a common language between business managers and environmental managers’ (Business and the Environment, 1998a). The ability of some organisations like Baxter to measure environmental considerations in a financial way is reflective of how advanced they are. Both financial indicators and measures of sustainability are usually implemented by a company much further down the road of environmental performance measurement than the average company because the metrics are much more difficult to develop (Business and the Environment 1998b). Bennett and James (1998a) categorise the developmental stages of organisations as “first, second and third generation approaches”. By their definition financial measures are developed in the second-approach and sustainability ones by the third-generation approach. I would have expected

financial indicators to be separated out into those that directly affect business operational costs, and those that do not, and for these areas to be second and third-generation approaches respectively.

In a section written on the measurement and reporting of sustainability Welford and Jones (1996) stated that one of the important principles of the measurement process was:

“The judgement as to how far a company is attaining any particular measure of sustainability must be made by a wide range of stakeholders.”

Various methods have been employed for the measurement of EPIs relating to stakeholders. IBM UK employed a consultancy, Ecotec, to approach their stakeholders directly to ascertain what they thought were key environmental performance areas and how they prioritised them (IBM 1995, ten Brink et al., 1996). The consultancy then assessed IBM against these parameters using its model of best practice. IBM was then able to prioritise those areas that were of high priority to the stakeholder but of low performance compared to best practice. IBM then proposed that their stakeholders benchmark themselves against the same parameters and against best practice. This was unsuccessful because the stakeholders had dissimilar lists of parameters and associated priorities due to the differences in their own businesses. This tension between the individuality of businesses and the comparability of measures across industry sectors is a difficult issue. The chemical industry, being well advanced in measuring environmental performance, has been struggling since 1993, at the European level, to introduce reporting guidelines. The European Chemical Industry Council (CEFIC) has recently introduced such reporting guidelines that set 16 parameters to be reported against by its 21 member federations by 2002 (Business and the Environment, 1998c). It is on the Government's agenda not only to make corporate environmental reporting mandatory but also to improve the quality of environmental information available by addressing the large variation in the standard of corporate environmental reports and the absence of any comparison criteria (UKEN, 1998). In addition, the Government has itself proposed a set of 13 sustainability indicators, designed to extend the more traditional economic indicators of performance (Environment Watch, 1998b). A study of the development of environmental reports showed that no overall framework had been created, nor was being used, by managers on the production of environmental reports (Azzone et al., 1996b). It identified important issues to be.

“ (i) the low level of standardization of the reported information; and (ii) the limited extent of the presented data”

They address the individuality of firms by saying that standardisation should not mean that all companies report on the same information but that the overall structure of the documents should be harmonised and the main classes of indicators defined. The paper goes on to say that these processes should be driven by the information needs of the main stakeholders.

ISO 14031 has been criticised for not meeting the need for this type of standardisation and for not addressing implementation issues, i.e. how key indicators might be measured (Bennett and James, 1998b). As such, although its intentions may be complimentary to, it is lacking in its more functional support of the EMS standard ISO 14001. In unison with ISO 14001 the standard does not reference environmental reporting even though it does mention that stakeholder requirements should define parameter identification.

5.0 Work to Date

5.1 Initial Projects

During the first six months of the project, the work involved an overall scoping exercise of the main areas of ICL's external environmental information requirements. The reviews carried out were on the following areas:

- A review of the legislative situation at the time including the UK draft regulations on packaging, contaminated land and the regulations on special waste and batteries. Reports on each were produced for use within Corporate Environmental Affairs (CEA).
- The position of Fujitsu, ICL's parent company (at the time a 90% shareholder), on environmental management issues, including its ISO 14001 implementation programme. This was carried out via participation in the European Fujitsu Environmental Conference and the minutes were documented.

One project carried out during the first six months of the project focused on internal environmental information requirements pertaining to the disposal of large quantities of electronic equipment, components and spares. The size of the disposal necessary was due to rapid changes in the types of equipment and methods of servicing and the resultant decrease in the number of spares that this required. The servicing of equipment had begun to use more modular units rather than individual components. This led to rapid obsolescence because less individual spares were being kept. The resulting large scale disposition raised concerns over its implications to the 'Duty of Care' within the Environmental Protection Act 1990. It became apparent that the environmental risk of such a large disposal was considerable and that the companies contracted to handle it should be made aware of the environmental law and their (and ICL's) liability. The study identified the hazardous components of the electronic waste and carried out an identification of these components within the lists of the unserviceable spares so that they could be separated out. This information could then be provided to the business concerned in order to manage this particular disposition and any in the future.

In response to ICL having signed a declaration of commitment for energy efficiency under the UK Government's 'Making a Corporate Commitment Campaign', a project was set up to ascertain the state of energy management within the company, the progress of ICL sites, and a survey on their energy conservation initiatives. A survey, by questionnaires, was carried out to assess the different ICL sites' progress with regards to energy efficiency programmes. This project served to raise environmental awareness concerning energy conservation, the importance of monitoring progress, and as source information for the production of ICL's first Corporate Environmental Report. The six month report includes details of ICL's commitment to energy consumption reduction as laid out in the Corporate Environmental Targets and outlines the data management of targets for which I am responsible. The target measures system, to which this relates, is detailed further in the 18 month report.

Finally, due to the sale of the manufacturing arm in March 1997, a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was carried out on its impact on ICL's environmental position. The analysis looked at ICL's relationship with the manufacturing partner, Design to Distribution (D2D), and identified the impacts of its sale to Celestica. In addition, it identified the external threats and opportunities arising from the metamorphosis from manufacturing to systems integration and services.

5.2 The UK Government's Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997

The UK Government's transposal of the EU Directive is the most complex of all the Member States. This has meant that it is both difficult and time-consuming to implement within an organisation. The spirit of the legislation is shared responsibility over the different activities carried out down the supply chain but it only applies to producers and not to consumers. Companies are often burdened by more than one activity obligation which may well be carried out elsewhere in the supply chain. The legislation is highly bureaucratic and demands a great deal of data from obligated companies. The acquisition of such data and subsequent analysis to provide the relevant and formatted information is an expensive and time-consuming process. This processing of information, which needs to be auditable, requires databases and information systems to be set up. To meet the information requirements of the legislation, the information on packaging flows needs to be consistent but product lines and trading levels are non-static. This presents the problem of continuous updating and changing of the databases or computer systems that are eventually put in place. At present, there is no information in ICL on the total amounts spent on packaging and the information systems do not hold information on the metrics of packaging weights by material composition. Often the existing product data systems do not have any capacity for new data. Over the second six month period, the research focused on ICL's compliance to the UK Government's Producer Responsibility (Packaging Waste) Regulations 1997. The deadline for registering with, and providing 1996 packaging flows data to, the Environment Agency was the 31st August 1997. The analysis and management of this data became my responsibility, once it had been gathered within the various ICL businesses.

As a consumer of certain packaging, ICL can use packaging waste arising on its sites to meet its recovery and recycling obligations. In response to this the project looked to assess the composition and quantities of ICL's packaging waste. Under my supervision, four MSc students were taken on to carry out two projects relating to the legislation. The first of these projects consisted of a Waste Review including an analysis of the waste, and the second project was for one of the students to research into plastic packaging waste. A waste measurement and sampling methodology had to be designed for the purposes of the waste analysis within the review. This methodology was adapted as the project progressed and was reapplied for a second waste review that was carried out during the second year of the project. The waste reviews covered the main warehouse sites of the company. The results of the waste analyses carried out during the two waste reviews allowed the percentage waste composition to be calculated and the annual quantities of the different packaging waste materials to be extrapolated using total waste disposal data. These results allowed the company to assess its capacity to meet its recycling and recovery targets for compliance to the packaging waste regulations. The second MSc project was set up because ICL handles a lot of plastic packaging. The research made recommendations for ICL to initiate plastics recycling projects and to liaise with their recyclers on recycling issues for the purposes of effective waste management. A case study of Greggham plastics was used within the research to exemplify this.

In order for ICL to report on the rigorous packaging information demands of the legislation, I designed spreadsheets and explanatory documents for the ICL businesses to report their data to CEA. This system, although a simplification of the legislative requirements was still found

to be too complex for the businesses to use. Subsequently, I designed questionnaires to replace the spreadsheets and these were then used for data provision and manipulated later within the original spreadsheet design. Prior to the legislation, no measurements of packaging weights had been recorded, which meant that two approaches to gathering these data had to be applied. Firstly, questionnaires had to be sent to suppliers and secondly, generic packaging categories had to be identified and substantial weighing programmes carried out on them. Most of the data provided had been synthetically produced by multiplying packaging flow percentages, estimated from shipping data or sales figures, against total packaging weights by material type. This process is not only inaccurate but also difficult to process year on year. The project leaders for each ICL business need easier and more accurate access to packaging data. In response to this, and the increasing accuracy required by the legislation from the year 2000, a project was set up with an ICL business consultant to populate ICL's corporate product database, 3PI, with the necessary packaging data. To initiate the project, a logic model was designed to identify all the data elements that would enable ICL to calculate its obligations and to provide the Environment Agency with the necessary information. This project is continuing and will need to adapt as the legislation develops. The packaging regulations are currently under review and the research has sought to follow the review consultation process and its likely impacts on the company's information requirements. For the purposes of information dissemination on the packaging legislation project, a review document was produced and distributed to the packaging teams within the business units. In addition, the review document was posted with the questionnaires on the ICL intranet, Cafe Vik (see Appendix 1).

The legislation fails to close the life cycle loop in terms of the recycling and recovery infrastructure. For example, it is mandatory to recycle packaging but not to purchase recycled packaging which suggests the prospect of another DSD (Duales System Deutschland). Neither have there been any actions taken to promote voluntary improvements to the UK recovery and recycling infrastructure. The receipts for packaging recycled or recovered is in the form of PRNs (Producer Responsibility Notes) and these can only be provided by accredited reprocessors. The PRNs are presented to the Environment Agency to show that a company's obligations have been met. At present, there is no transparency as regards the investments being made by the reprocessing industry from the sale of PRNs. This raised questions as to whether the PRN market will have the desired effect of stimulating the growth of the reprocessing industry. In addition, there is no correlation between the PRNs and the packaging waste that a company is responsible for having recovered or recycled. This is likely to discourage recycling initiatives within companies, because they could, in principle, recover and recycle nothing and simply buy PRNs. It is yet to be seen as to whether this is the case and the levels of recovery and recycling fall. If this is the case, it should be short lived as the increasing demand on fewer PRNs will push up the prices and make recycling initiatives worthwhile.

Further to work carried out on the different wastes produced by ICL, a waste manual was produced for use by ICL businesses which describes all environmental issues, including legislative compliance, pertaining to ICL's different waste streams and includes procedures for dealing with the waste. In addition, a survey was carried out on the waste production at all ICL's sites. Both projects are documented in the eighteen month report.

5.3 Environmental Management Systems

Towards the end of the first year, as a contribution to the EngD programme, I assisted in the organisation of the Environmental Hands-on Audit module that was carried out at one of ICL's business headquarters in Slough. This facilitated me to begin drafting the Legislation Manual and Procedures for the business's intended ISO 14001 registration. Details of this have been written in the 18 month report. I subsequently became actively involved in the ISO 14001 implementation process at this ICL business and attended meetings with the procurement representative, the Technical Design Authority (TDA) representative, and the business's ISO 14001 programme manager. Unfortunately, extensive organisational changes prevented the continuation of implementation in this area. The business changed name and location and the programme manager was moved from the business unit to ICL quality programme management.

Plans for an ISO 14001 implementation programme across ICL are currently being drafted and, as I will be actively involved in the necessary auditing processes, I have undergone an Advanced Environmental Auditors Training Course as an EngD elective module and will be registering with the EARA. In addition, I have taken an exam for the Institute of Environmental Management and thereby gained Associate Membership.

5.4 Corporate Environmental Information Management

The aims of CEA include awareness raising, training provision, legislative interpretation and compliance methods, and communication with stakeholders, customers and suppliers. All of these elements both require and provide a plethora of data, all of which require collection. Once this can be achieved the environmental information produced then needs managing. The management decisions that can be made on the basis of such information are dependent on the quality and quantity of the information provided. Thus there is a role for information management of environmental information just as there is with any other type of business information. By the end of the first year a model had been drawn up to show the environmental information flow (see figure 2.).

During the first year, a study of corporate environmental reports had been carried out in order to assess companies for the quality of their environmental information. Overall, the study looked at over one hundred environmental reports on the internet and around fifty hard copies and the observations are recorded in the twelve month report. The difficulty encountered was in distinguishing whether the poor quality of the information in the reports was due to problems of communication and data presentation or the actual data used in its production. The study was, therefore, limited in giving a clear idea of which companies handled the information well and which did not. It would be simplistic to assume, for example, that companies who do not produce environmental reports do not handle their information well. The study did highlight the importance of managing environmental information well and the problem areas within environmental reporting.

THE ROLE OF ENVIRONMENTAL INFORMATION MANAGEMENT (EIM)

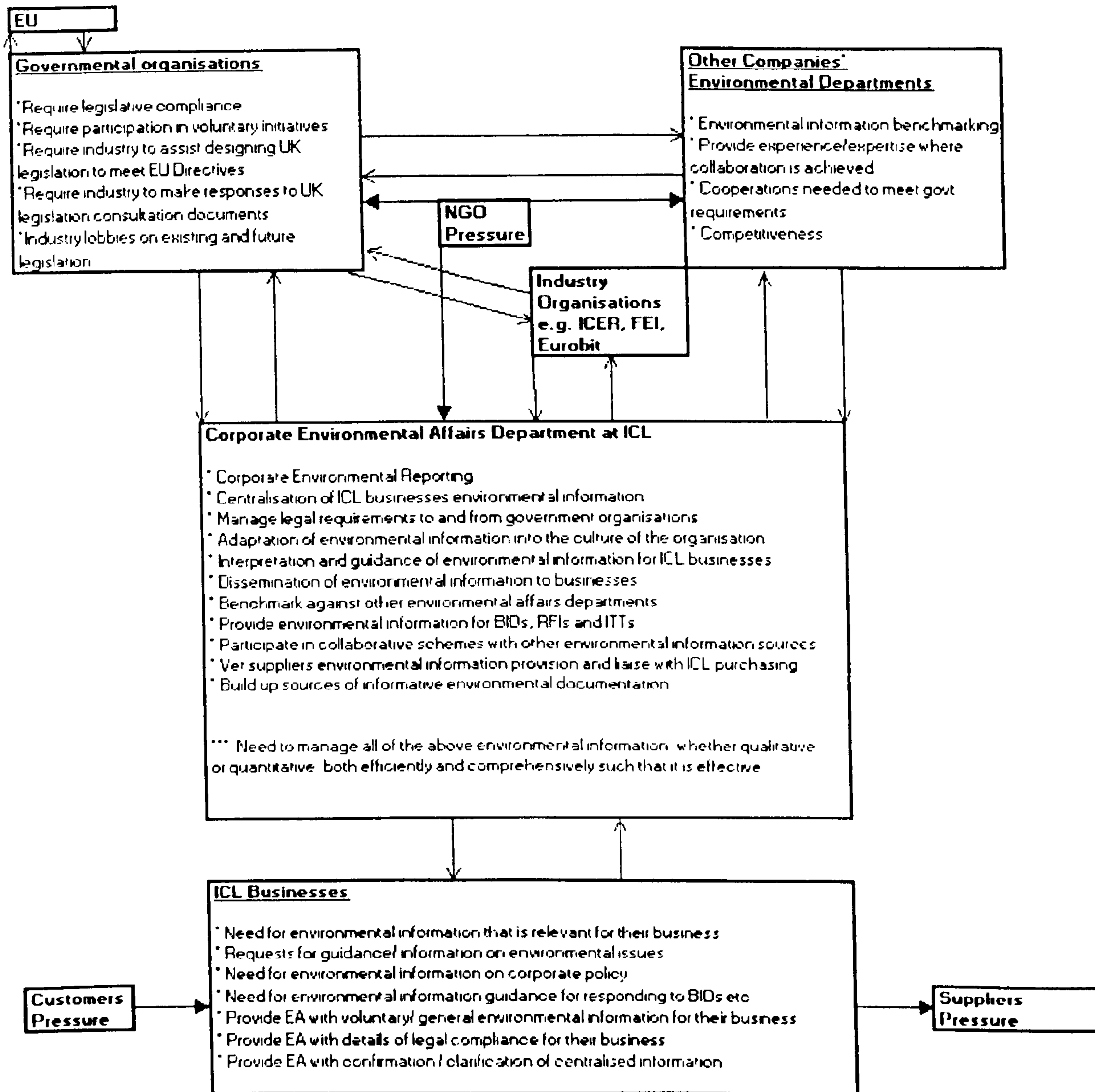


Figure 2: The Role of Environmental Information Management

5.5 Barriers to Environmental Information Flow

Over the first two years several areas have been identified as being detrimental to the flow of environmental information within the company. The two main areas being decentralisation and the sub-contraction of site facilities. During the first six months, the way in which the decentralised organisational structure presented a barrier to information flow was observed. It had resulted from the company's move from a monolithic hierarchy to a flat, empowered structure. ICL had become a group of diverse businesses with greater autonomy and this had had a detrimental affect on the efficiency of the collection and dissemination of information, including environmental information. There have, therefore, been moves within ICL towards a more holistic organisational culture, what is known as the 'one ICL project' within the company. This has been triggered by the lack of business information flow causing damage to ICL business as a whole, the fact that several businesses were competing against each other, and the loss of brand awareness.

Similarly, there is a need for environmental information to be centralised in order for it to become manageable. The UK packaging legislation has highlighted this need due to its extensive information requirements on the organisation and the risk of either the omission or the duplication of the necessary data as a result of the individuation of business units. The degree of decentralisation is an important organisational feature for environmental management and is applied by Bennett and James (1998a) in their identification of different organisational approaches to environmental performance measurement

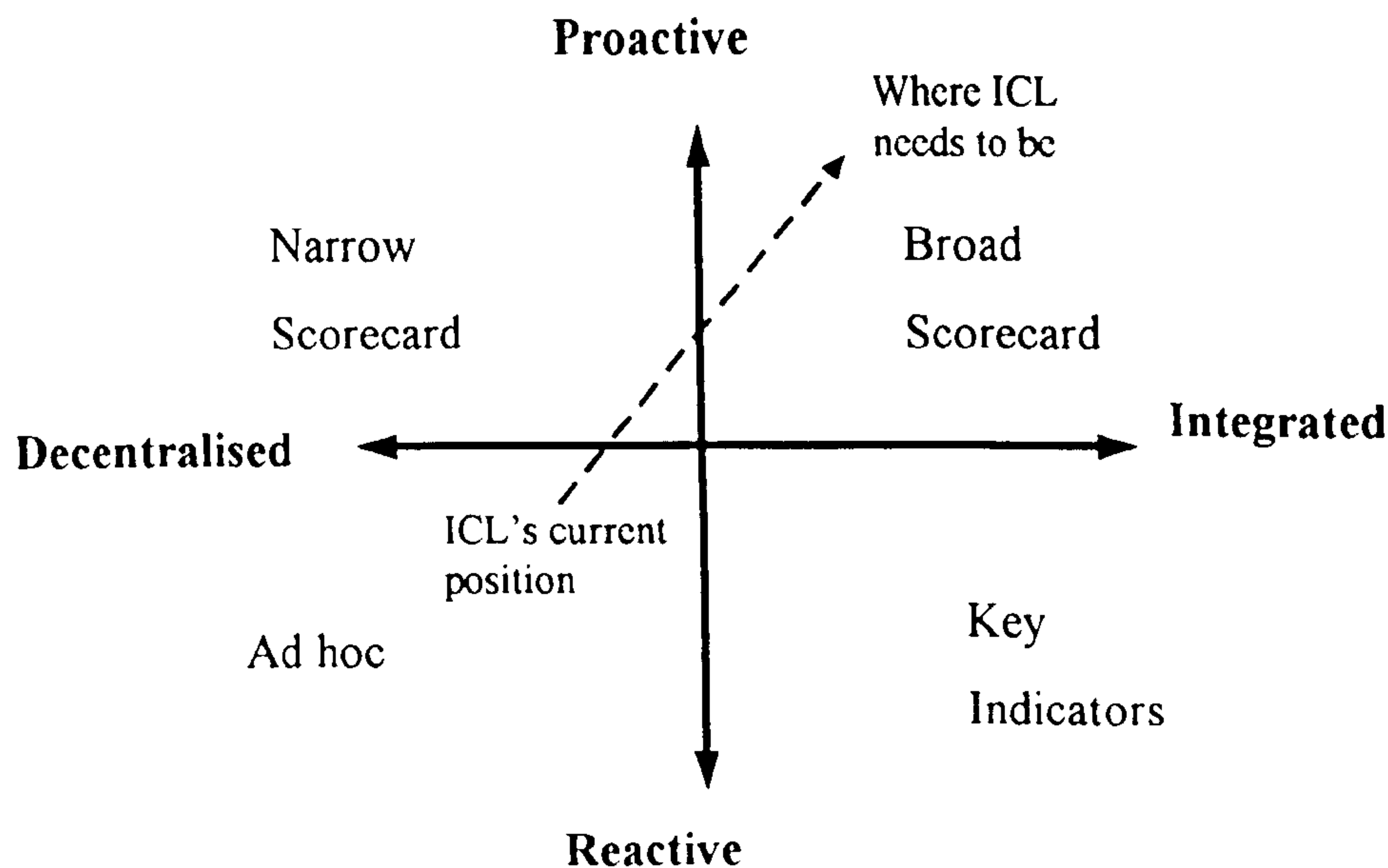
“One over-riding theme in our interviews was the way in which the context and implementation of environment-related performance measurement is strongly influenced by organisational circumstances, particularly the degree of decentralisation.”

Their research confirms the conclusions from this research project that there is a tension between departments such as ICL's CEA and the business units or sites such that there is a bias against the provision and circulation of information to and from these areas. The approach of ICL to this problem echoes that of the similar departments in that it seeks to be consultative and helpful to the business units in preference to being prescriptive or dictatorial. In real terms, the pressure of legislative compliance often renders the consultative approach as a non-option and pressure for the provision of information has to be applied. Legislative environmental information, such as the packaging data, is perceived to be an unnecessary cost burden on business function to the point where business managers have actually questioned CEA as to why ICL can't "just pay the fine instead" because it would be so much cheaper to do so.

Bennett and James (1998a) describe a model of corporate approaches to environment-related performance measurement that is based on the level of decentralisation and the amount to which the organisation is reactive or proactive. As various studies have shown that a more proactive approach to environmental management is beneficial to organisations overall, the implications for ICL are clear. I have indicated ICL's current position on the model and the direction in which it needs to move, by means of a dotted arrow, in the development of its environmental performance measures (see figure 3). The shift to the proposed positioning for ICL will depend on the level of integration that the 'one ICL project' may create, which is unlikely to be to any great degree, and hence it remains close to the vertical axis. The current

position is indicated to be within the Ad hoc area but this is only just the case and so is close to the horizontal axis.

Figure 3: Bennett and James' (1998a) Model of Corporate Approaches to Environment-Related Performance Measurement Including Indications of ICL's Current and Possible Future Positions



Definitions (Summarised from Bennett and James 1998a):

Ad hoc: Undertake environmental performance measurement as needed to comply with legislation and minimal environmental policies and focus on easily obtainable data, e.g. energy consumption.

Key indicators: A more systematic approach to performance measurement due to the level of integration. A degree of effort is made to measure significant environmental effects, although still relies on easily collected data. Includes risk, resource and implementation and conformity measures.

Narrow scorecard: Possess proactive policies but experience difficulties in obtaining and standardising the environmental information from the autonomous business units. Develop a few representative indicators through a consensus process involving the businesses.

Broad scorecard: Environmental performance measures are holistically developed due to the integration of the company and are subsequently able to measure and deal with all environmental impacts.

Another barrier to environmental information flow within the organisation, especially data relating to the targets, is the fact that ICL's sites facilities management are subcontracted out to another company, Workplace Management Ltd (WML). As this company has different interests, it is extremely difficult for ICL to manage its building's environmental impacts through them and to gather the necessary environmental information from them. In addition, there are no contractual requirements on WML to provide environmental information or to

partake in its environmental management programmes. As WML's contract is up for renewal, this is an area that ICL will need to address. An example of this came to light during the waste review process. The information that was required by the waste review was not forthcoming and often did not tally with that discovered from the waste measurements taken.

6.0 Proposed Future Research

- To update and continually review the environmental information requirements and flows within ICL. To continue to evaluate the impacts of the packaging legislation in the light of the consultation process and new requirements. To continually assess current and future environmental legislation for its information requirements on the company and its impacts on the company's environmental performance.
- To continue the project to utilise ICL's existing product information systems for the packaging data required by the legislation. To develop new systems where needed to meet legislative information needs.
- To establish communication channels down supply chains for the purpose of improving information flow and encouraging innovative environmental agreements.
- To benchmark ICL's environmental reporting capability against others within the IT industry and to assess the performance measurement needs. To carry out a study of the literature on environmental performance measurement and applications of theory to practice, i.e. case study material.
- To investigate current knowledge on environment-related performance measurement and to develop performance measures that are both compatible with ISO 14031 and in line with ICL's new policy and targets for 1999. This will ensure the organisation has practical tools with which to meet its corporate environmental policy and targets
- To develop normalisation techniques where necessary to facilitate environmental performance measurement within ICL.
- To adapt and integrate the performance measures, utilising a consultative approach, into the process of ISO14001 implementation within the first ICL business to go for the certification. This is expected to be ICL MC (Multivendor Computing).
- To provide generic EMS documentation in order to facilitate and support ISO 14001 implementation, by ICL businesses. To develop the necessary processes and procedures whereby the performance indicators can be measured.
- To develop and implement a new information system for target data collection within CEA in order to gather environmental performance data and provide the necessary tools for evaluating ICL's environmental performance against its targets.
- To adapt the set of measures to the businesses that follow ICL MC in implementing an EMS. Even though the project is unlikely to run to a second year's certification, whereby the effectiveness of the measures can be tested by the external verification, it should be possible to assess the robustness and effectiveness of the measures in demonstrating continuous improvement.
- To continue to develop an infrastructure for CEA at ICL in order that the department can manage its environmental information effectively and thereby improve its environmental performance through effective corporate environmental management processes.
- To develop appropriate software, if deemed necessary and time allows, in collaboration with ICL software designers, to facilitate environmental information management and decision-making processes within CEA.

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Appendices

1. ICL Packaging Project Status Document
2. Project Plan
3. EngD Conference Paper 1996 “The Role for Environmental Information Management”
4. EngD Conference Paper 1997 “The Effects of Recent Legislation on Environmental Performance Measurement and the Development of Environmental Management Systems”

Report Number 4

Appendix 1

Appendix 1: ICL Packaging Project Status Document

**ICL's Programme for Compliance with the UK Producer Responsibility Obligations
(Packaging Waste) Regulations 1997**

I Statement of ICL's Obligations

ICL plc has registered with the Environment Agency independently of collective schemes in compliance with the Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997.

The packaging which ICL uses comprises paper/ card, plastics, steel and wood. ICL is, therefore, obligated under the UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997 to recover and recycle packaging waste comprising paper/ cardboard, plastics, steel and wood. ICL's statement of obligations to the Environment Agency for 1997 packaging flows is shown in the table below:

ICL's Statement of Obligations (1997 Data in tonnes)

Recovery obligation			361.19	
Recycling obligation	paper		61.29	
	glass		0.00	
	metals	aluminium		0.00
		steel		0.34
	plastic		4.91	

ICL is required to report to the Environment Agency on its use of wood, but is not obligated to recover and recycle wood until the year 2000.

II ICL's Compliance Activities

Information Management

The data on packaging flows throughout ICL operations, as required by the legislation, is collected and centralised from the following list of ICL businesses:

ICL Multivendor Computing (ICL MC)

ICL Operational Services Division (OSD)

ICL Retail

High Performance Systems (HPS)

Financial Systems Services (FSS)

ICL Pathway

(In 1997 this list included Teamware)

Two basic methods have been employed with regard to data generation. These were, firstly, to identify and measure generic packaging types and secondly, to identify business streams and marry product shipping information with packaging data. Standard Excel spreadsheets have been used to date for reporting purposes. There is now a project underway (funded and sponsored by CEA, leading with Mike O'Hare of GISI) to utilise Access Databases and to adapt ICL's 3PI Information System to include comprehensive data on packaging types and weights. This will greatly improve the data collection process.

III ICL's Waste Strategy and Packaging Recovery Notes (PRNs)

ICL's Packaging Waste Arisings

A waste measurement strategy concentrating largely on packaging waste was designed as part of an environmental waste review carried out at ICL's largest site, the Stevenage campus. This detailed audit yielded the amounts of packaging waste arising at two of ICL's major warehouses. Two further waste measurement audits were carried out at a third major ICL

warehouse at Warrington. The results of all the waste measurement reviews carried out were correlated, in terms of material flows, with total annual waste information from the contracting waste management companies. This enabled estimates to be calculated of average packaging waste arisings from the two sites, and therefore, how much packaging waste is available for recovery and recycling.

The aim of the exercise was to establish how closely ICL could meet its packaging waste obligations under the UK packaging legislation from these two sites. The results were analysed and a comparison made between the ICL's obligation for this year, based on 1997 data, and the waste arisings for the two sites.

The following table shows the results from the Stevenage and Warrington waste reviews and the calculations made.

Material	Obligation	Waste Arisings		Balance
		Stevenage	Warrington	
Paper	Recycling 61.29	374.7	86.5	399.91
Plastic	Recycling 4.91	107.3	23.8	126.19
Steel	Recycling 0.34	0	0	- 0.34
General	Recovery 361.19	(399.91+126.19= 526.1)		164.91

The results clearly show that ICL can easily meet its packaging obligations from the two sites, thus minimising the environmental impacts, such as transport. Other savings include the associated costs of collecting packaging from customers and the cost of logistics for the return of packaging.

ICL has set up an agreement with Celestica with regards to its obligations, whereby Celestica picks up the packer/ filler obligations on ICL's packaging and ICL takes the retailer obligation.

As part of ICL's waste management strategy programme, a system of documentation and audits for all packaging wastes sent to waste management companies and reprocessors will be set up. This will be carried out for each site with appreciable packaging waste arisings, i.e. Stevenage and Warrington etc. It will be based on the audit data outlined above.

PRN Procurement

Where ICL's reprocessors have not provided PRNs for any reason, or where CEA's judgement the PRN prices being charged have been unacceptably high, alternative arrangements with other reprocessors have been made.

Plastics

Most ICL sites collect and recycle plastic cups using the Save a Cup scheme. CEA has used this programme to offset ICL's plastic recycling obligations via PRNs purchased from Save a Cup at £70 per tonne in October 1998. CEA has purchased a special EPS compactor for the Basingstoke site to meet the needs of the large amount of plastics returned to the site from the CHOTs project. The resulting blocks of compacted EPS will be recycled into wood replacement products by a company on the Isle of Wight.

Cardboard

There is a sorting process at Stevenage for waste cardboard packaging for which two large bailers have been purchased and sited at Ste10 and Ste14. The Stevenage site uses Cleanaway as its waste management company who deliver cardboard for recycling to St Regis and plastics to Linpac. Warrington is expecting to have a bailer installed at the site and will be using it in 1999 for storing cardboard ready to be taken away for recycling by its waste management company. Slough 06 bought a compactor for cardboard recycling in 1997 as part of its

environmental campaign following environmental reviews of the site. Norman Renwick at Manchester 05 set up a relationship with BPB Recycling whereby ICL bought PRNs to offset 11 tonnes of its cardboard and paper recycling obligation at £30 p.t. + admin. charges. The remainder of ICL's paper and cardboard packaging waste obligation was offset by a relationship with Mayer Parry who procured 52 tonnes of paper and cardboard PRNs at only £25 p.t. on behalf of ICL.

ICL met its steel obligation (negligable) and its overall recovery obligation through its relationship with Mayer Parry.

Environmental Innovations

ICL Retail has reduced its packaging waste by minimising the use of packaging and replacing packaging for components with reusable boxes. The custom designed packaging incorporates a compartmentalised section for components to be individually protected and a larger section above for the PC to be placed on top. In order to reduce the amount of plastic packaging used, airbags have been used to replace the bubblewrap or polystyrene chips used to cushion the machines. The airbags are made of a more environmentally friendly material than the original plastics packaging used. Once the package has arrived on site, the products are removed and the packaging is returned to be reused as part of the asset recovery cycle. ICL OSD has introduced the airbag and run a reduction programme on its packaging and has achieved considerable cost savings as a result.

G. Collins

CEA Dec. 1998

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Appendix 2

Appendix 2: Project Plan

Objectives	Deliverables	Dates
1. To review the environmental information requirements and flows within a multinational information technology business.		
	1) Develop model of information flows within the company and industry	Completed 31/9/96 To be refined 30/7/1999
	2) Review CEA activities and environmental status of environmental data collection	Completed 31/9/97
2. To review the impacts of current and future environmental legislation on the information requirements and environmental performance of the company.		
	1) Review environmental legislation directly relating to ICL's operations.	Completed 31/9/96 Updated 31/9/97 Update to be completed 30/7/99
	2) Review packaging legislative information requirements.	Completed 31/9/96 Updated 31/9/97 Update to be completed 30/7/99
	3) Packaging legislation's impact on ICL's environmental performance.	Completed 31/9/98 Review to be updated by 1/10/99
3. To design, develop and implement a system for ICL to meet the environmental information requirements reviewed with particular emphasis on legislative demands.		
	1) Produce packaging legislation information requirements logic model	Completed 31/3/98
	2) Integrate information into ICL's information systems and establish necessary communication channels, including suppliers	To be completed by 1/12/99
	4) Framework development for information infrastructure, including software applications where necessary	To be completed by 30/9/2000

4. To apply the current knowledge on environment-related performance measurement to ICL's information needs to ensure the organisation has practical tools with which to meet its Corporate Policy and Targets. To develop appropriate relative and normalisation techniques to performance measurement within ICL.

1) Assessment of current literature on environmental performance measures

Completed 15/1/99

2) Assess case studies of the applications of performance indicators

To be completed by 30/3/99

3) Application to ICL's performance evaluation requirements

To be completed by 30/3/99

4) Development of measures, incorporating techniques

To be completed by 28/5/99

5. To integrate such environmental performance measurement into the process of ISO14001 implementation within the company. To ensure that such measures facilitate continuous improvement programs within ISO 14001.

1) Production of generic literature to support ISO 14001 incorporating performance measures

To be completed by 30/7/99

2) Review measures robustness in demonstrating continuous improvement against company targets

To be completed by 31/7/2000

3) Assess measures capacity to meet ICL's stakeholder and reporting requirements, including benchmarking

To be completed by 31/7/2000

6. Publish papers relevant to research focus in academically vetted journals within four months of completed research

1) The impact of packaging legislation on a companies environmental performance - case study of ICL's approach (to include waste sampling and measurement

To be submitted by 30/9/99

3) Paper on the use of environmental performance measures in ISO 14001 for continuous improvement in the IT industry

To be submitted by 29/9/2000

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Appendix 3

THE ROLE FOR ENVIRONMENTAL INFORMATION MANAGEMENT

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Abstract

The project is based in a multinational Information Technology company, ICL plc, which operates in over 70 countries. A small Corporate Environmental Affairs Department was set up to address environmental concerns for ICL operations worldwide. The department seeks to raise awareness, provide training and education, respond to legislation, lobby at a national and European level, facilitate environmental management systems, and to benchmark against stakeholders. In the first year, the research has addressed two main issues, firstly how people deal with environmental information and secondly the development of a waste strategy for the company.

This paper seeks to outline the role for environmental information management within multinational organisations. It explores how environmental information is used via a number of organisational investigations. This includes a study of corporate environmental reports that has been carried out in order to assess the effectiveness and efficiency of the use of environmental information.

In order for ICL to develop a more closely defined waste strategy and to meet The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997, waste audits have been set up and a summary of the progress is presented.

The future of the research on environmental information is outlined and will involve an extensive survey and case studies of selected companies. The application and benefits of this research to ICL's environmental management programmes are discussed.

Key words : Environmental management, environmental information, corporate environmental issues, packaging legislation, waste sampling.

1. Introduction

A company's response to environmental pressures and the resultant Environmental Management Systems (EMSs) that are developed, depend largely on the corporate strategy of the company¹. Within the framework of ISO14001, there is a requirement for continuous improvement of the EMS². In order to facilitate an improvement in environmental performance, however, a generic EMS should involve the creation of new

and informed environmental factors for management. Environmental performance measurement demands the categorisation of such information³.

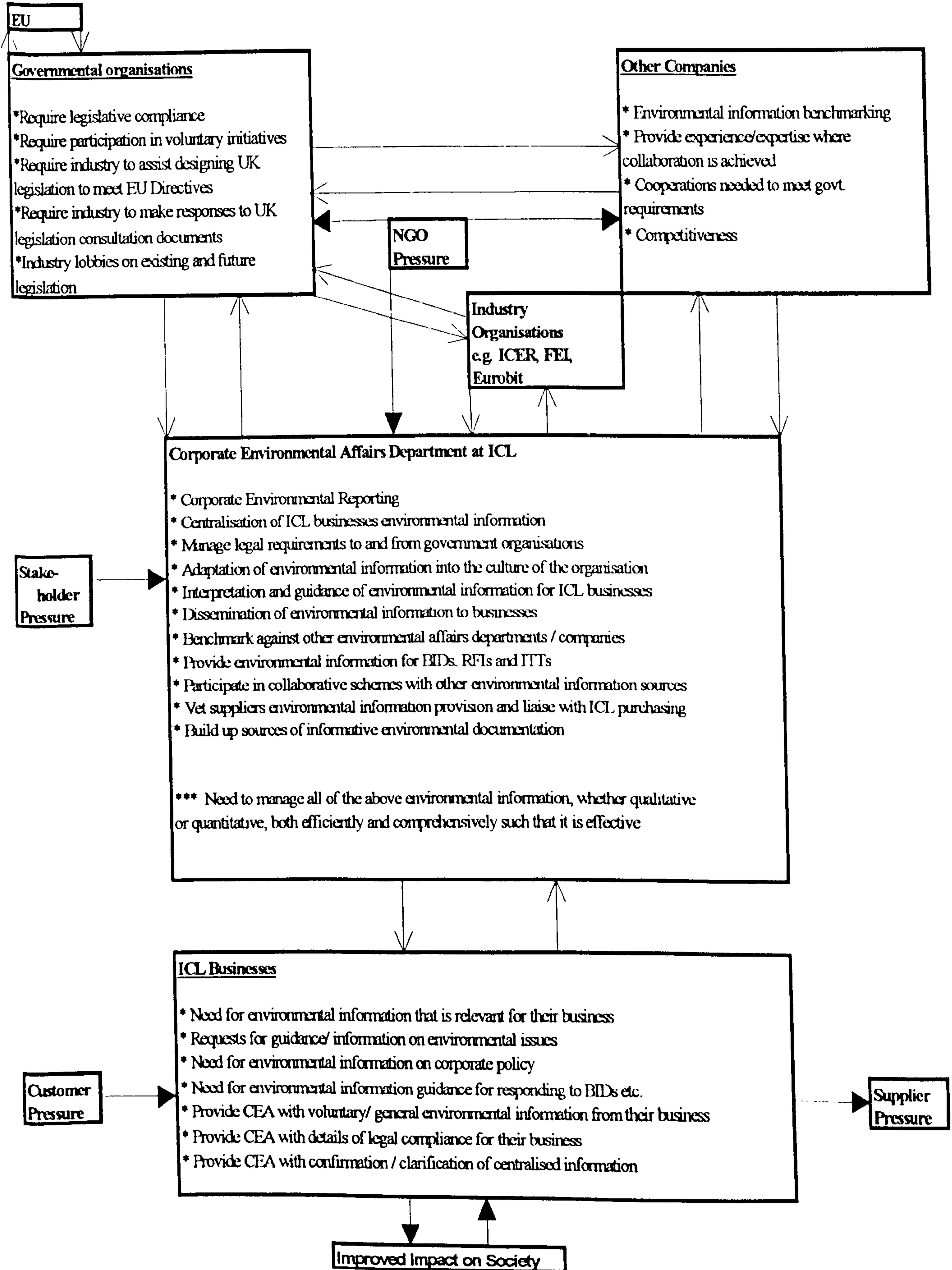
The centralisation and dissemination of environmental information are some of the main functions of ICL's Corporate Environmental Affairs Department. In order for the company to improve its performance, there is a need to develop a strategy for managing the information.

The role for environmental information management (EIM) within the corporate environmental affairs department, and which may typify that of other organisations, is outlined in the Fig. 1. It shows the different pressures that create the need for the management and control of such information. The constant assessment of the details and likely impacts of impending legislation is essential to inform the businesses of potential threats to their operations and company image. This is an example of information flowing into the business which then flows internally within the organisation, requiring the formulation of defined environmental information systems, and the feedback of such information to customers, suppliers, regulators and the government.

In order to consider how EMS's can become performance-focused, there is a need to identify at the outset how environmental information is currently managed within an organisation and specific questions need to be asked. How is the environmental information managed? How does it flow within the organisation? How is environmental software utilised and is it adequate? How effectively is environmental information managed at present?

The Ancient Egyptians built the Pyramids by moving huge stones with mud and water, simple technology but great organisation. The sudden surge of the environmental movement has created not only a flooding of environmental information but also an ever-increasing demand for new information. We have a complex technology but equally great is the need to develop a capacity to organise the information effectively.

Fig. 1 THE ROLE FOR ENVIRONMENTAL INFORMATION MANAGEMENT (EIM)



2. Environmental Information

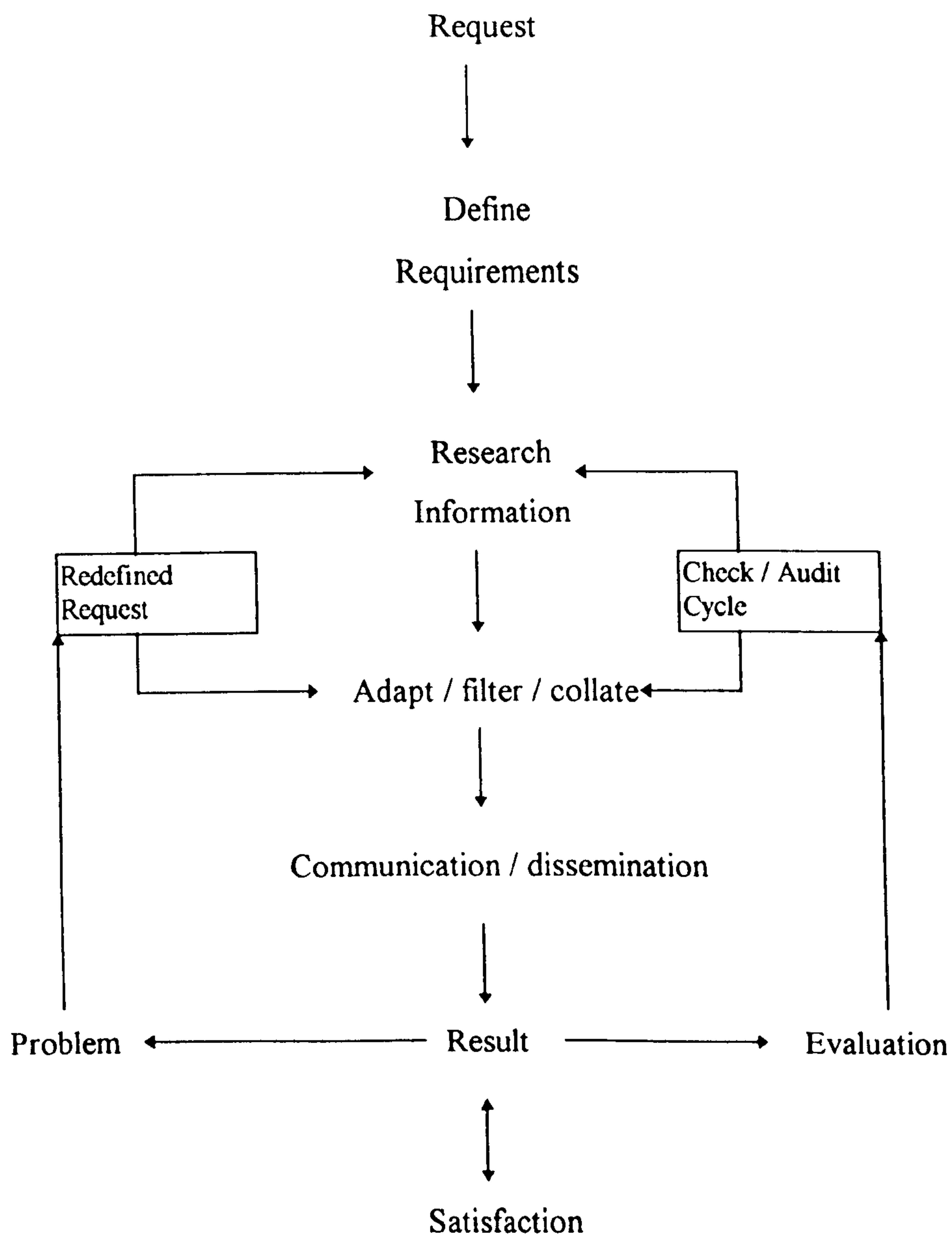
Environmental information can be defined as any environmental data that has been collected and analysed. The aims of managing environmental information within a corporate department is to raise awareness, provide training, interpret legislation, and communicate with stakeholders, customers and suppliers. The difficulties with communicating environmental information is mostly to do with how it is received. The barriers to the communication and use of environmental information include issues such as poor awareness, wide dispersion, non-recognition, non-availability, incorrect format, and incompatibility. The key considerations that would constitute the environmental information include:

- Definition of Requirements
- Categorisation
- Recording / logging systems
- Media for communication
- Flow and responsibilities
- Dissemination
- Centralisation
- Harmonisation / formatting

An internal process proposed for dealing with environmental information is outlined in fig.2 and it provides parameters for performance indication. These indications include: firstly, the greater the repetition of 'check/ audit' or 're-define' cycles, the lower the performance (although this may be related to the complexity of the request); and secondly, the level of the satisfaction at the result stage and the amount of evaluation input. Finally, there are the implications of the time it takes to complete the whole process which will be dependent on the complexity of the information.

The work at ICL is based in the Corporate Environmental Affairs Department, and offers the experience of undergoing interactive involvement in the business area of environmental management and, therefore, of adopting the role of participant observation.

Fig. 2 Internal Information Process



The major difficulties that have come to light so far have firstly been the perception of environmental information by business managers and secondly, the time constraints on those managers. There is a lack of environmental awareness within the organisation and a perception that the information is not relevant to them, and even when this is not the case the managers do not have the time to interpret the information to determine what is required from them. In addition, environmental information is seen as “the last thing on everyone’s list”, “of lowest priority” and “a hobby”. It is neither seen as integral to an individual’s job nor as a business issue but rather as an extra burden.

3. Policy and Cultural Issues

One of the crucial aspects of environmental information is for it to fit into the policy and culture of that organisation. The flow of information is conducted, after all, through people and up and down lines of responsibility. There is another overlap between organisational change management and the management of information systems and IT. TQEM is an example of how companies have integrated environmental management into their business functions through the pre-established quality culture. This has been effective in terms of both the practicality of implementation and the time savings with cultural incorporation.

Within ICL this involves both its quality culture and initiatives such as the Policy Framework. The Policy Framework is a programme for increasing the overall effectiveness of the ICL group. One of the major parts of this initiative is to ensure that all mandatory Group policies are adhered to, including ICL's Environmental Policy, and implement projects to improve compliance.

One of the modern changes to the organisational structure of businesses like ICL is that they have moved from a monolithic hierarchy to a flat, empowered structure. ICL has become a group of diverse businesses with greater autonomy throughout but as far as the efficiency of its collection and dissemination of environmental information is concerned, there is a need for this to be centralised in order for it to become manageable. The UK packaging legislation has highlighted this issue in terms of an organisation having to account for its packaging waste flows throughout the whole company.

So would a comparative study with other organisations who are already managing environmental information reasonably well help to formulate a framework? How important is the way in which they handle their environmental information for their EMSs?

4. Corporate Communications

The transmission of environmental information to a potentially large range of receiving audiences is the basis of corporate communications⁴. Corporate environmental reporting, as an example of the communications' capability of a company, is reflective of the quality of its environmental information and can be used as a performance indicator. A more advanced stage of managing environmental information is indicated by a strong training capability, but within most organisations this is in its infancy.

A study of corporate environmental reports has been carried out in order to assess companies for the efficiency of their environmental information. Overall, the study looked at over one hundred environmental reports on the Internet and around 50 hard copies.

The author's observations on environmental information given in reports suggest that this information is:

1. poorly communicated due to poor readability* and design⁶
2. lacking in detail and consistency
3. unreliable due to there being no agreed standard or code of practice for environmental reporting and little external verification
4. interesting but ambiguous and difficult to format
5. poor at relating performance of the business to environmental cost and risk
6. lacking in hard data that is both meaningful and understandable

The difficulty comes in distinguishing whether the poor quality of the environmental information in the reports is due to problems of communication and data presentation or the actual data used in its production. The study was therefore limited in giving a clear idea of which companies handled environmental information well and which did not. It would be simplistic to assume, for example, that companies who do not produce environmental reports do not handle their information well. The study did, however, produce evidence of the qualitative points outlined above and provided evidence that there is a definite role for EIM.

* This refers to a study carried out by C21, a group of environmental and communications specialists, using Fry's Readability Scale. The study showed that 80% of the FTSE top 100 reports they sampled were off the scale, i.e. post graduate level⁵.

5. Waste Audit Project

In order for ICL to develop a more closely defined waste strategy and to meet The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997, waste audits have been set up. Another driver behind the project is the expected rise in cost of landfill.

The project serves to illustrate the difficulty of gathering environmental information that has not been required previously. For example, packaging weights have not been recorded before, at least not by material type, and the information systems are often not sophisticated enough to log such information. A further complication is that waste management at ICL is contracted out to other companies who, because of handling charges, are not given any incentives to minimise ICL's waste.

In order to avoid the costs, both financial and environmental, of reverse logistics for recovery of packaging sent out of ICL, the company plans to meet its obligation from its own waste arisings. This poses the problem of whether the amount of packaging waste arising at ICL sites is enough to meet the company's obligation. Data on the packaging flows and weights, by pre-defined generic types, are being used to calculate the obligation.

The waste audits have been set up to involve weighing samples of the waste in order to assess the amount of different packaging material types arising. A waste sampling strategy has been designed and various factors such as complying with the duty of care regulations have had to be taken into account. The procedure has been expanded to incorporate the necessary practicalities to ensure accuracy of the results. The main considerations that have had to have been addressed include the weather conditions, negotiation of access, equipment, sample size, material types, timing and location.

Due to the lack of documentation on how to perform a waste measurement audit, the procedure and sampling strategy have had to be developed, continually expanded and reassessed as new experience and knowledge is gained. In the future, it is envisaged that the techniques can be adapted and used at other ICL sites and the information produced used to more closely define ICL's waste strategy.

6. Conclusions and Future Research

Environmental Legislation and Corporate Environmental Policy are becoming major drivers for the practical implementation of existing or planned EMS. The environmental management frameworks such as ISO14001 have been examined and found lacking in terms of ensuring environmental performance and sustainable development within businesses⁷.

The sudden increase in requirements for environmental information, and the responses to these requirements have both created a need for effective management within the organisation. A possible way of enabling the full utilisation of an EMS is to develop an efficient model for handling environmental information, and one that is designed to meet the culture and policies of the particular organisation.

A key characteristic will probably be looking at how to manage both quantitative and qualitative information. The research so far has mainly been looking at the various elements involved, such as the identification of information requirements for initial dissemination to the businesses.

ICL's solutions for managing the environmental information required by the UK's packaging legislation will hopefully lend themselves well to the impending EU Directive on waste electronics at end-of-life, as it is expected to be based on a similar producer responsibility framework. This will hopefully create a recognisable paradigm.

ICL's parent company, Fujitsu (around 90% shareholder), is pushing to implement ISO 14001 throughout all Fujitsu affiliates worldwide. This indirectly puts pressure on ICL to proliferate environmental management systems throughout its businesses. Future research will include benchmarking against stakeholder perceptions and activities. This is particularly adaptable to the initial stages of an environmental information model because it addresses the questions of selection and priority. It is applicable to the assessment of environmental information in terms of social responsibilities and the expectations and demands of the stakeholder⁸.

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Appendix 4

THE EFFECTS OF RECENT LEGISLATION ON ENVIRONMENTAL PERFORMANCE MEASUREMENT AND THE DEVELOPMENT OF ENVIRONMENTAL MANAGEMENT SYSTEMS

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Abstract

The paper reports on work carried out within the Corporate Environmental Affairs Department at ICL (International Computers Ltd). In the first year, the research sought to outline the role for environmental information management within multinational organisations. The work focused on the management of packaging waste through waste measurement audits and developed a methodology for meeting certain information requirements. This enabled ICL to develop a waste strategy and to meet The UK Producer Responsibility Obligations (Packaging Waste) Regulations 1997.

During the second year, the emphasis of the project has been on the effects of environmental legislation on the environmental programmes within an organisation such as ICL. Environmental legislation is increasingly demanding the provision of extensive environmental performance information from companies. The tools necessary to provide such information have to be developed and such processes incorporated into a company's environmental management system (EMS).

ICL's response to the environmental legislation has been assessed together with the related developments in its environmental programmes. Environmental performance indicators have been identified and a framework for their measurement developed. As part of ICL's commitment to implement ISO 14001 the necessary steps required for its incorporation have been evaluated.

Key words: Environmental Legislation and Management, ISO 14001, Information Management, Performance Indicators

1 Introduction

Research has shown that legislation remains the strongest driver of environmental activity within businesses^{1,2&3}, despite nearly a decade of 'green business' culture and attempts to persuade companies to internalise the drive for environmental change.

The introduction of packaging legislation into the UK is interesting because the self-regulatory role was rejected by business, which opted for protecting its individual

false sense of security. It is important for environmental objectives to be measurable in order that they may be prioritised by managers and not driven to the bottom of the pile next to financial objectives that would otherwise be clearer targets to meet.

The measurement programmes being set up by companies are much like other continuous improvement initiatives such as those within a TQM (Total Quality Management) programme. It is a multi-functional process in that it meets the needs not only of a company's legal compliance but also of providing information for public disclosure and of exhibiting evidence of continuous improvement necessary for maintaining ISO 14001 certification. A measurement programme involves the identification of environmental performance indicators and the development of a framework for measuring them.

2. ICL's Response

In response to the draft Batteries Directive, ICL has reviewed its current practices and is in the process of drawing up new guidelines in the form of a brochure to raise environmental awareness in an effort to move towards improved environmental performance. A Waste Manual was produced in order to provide ICL businesses with guidance on environmental best practice.

UK Packaging Regulations

ICL has managed to tackle the problem of managing packaging data and information flow by introducing detailed weighing programmes and analysis of business shipping data. The next stage involved centralising the different forms of data by designing an information system. In order to design the database required, a logic model was developed by the author based on a list of questions designed to capture the necessary information as efficiently as possible (see fig. 1).

It is intended that this model be applied to the corporate information system known as 3PI, so that packaging information can be stored in such a way as to facilitate accurate and thorough returns by the ICL businesses to Corporate Environmental Affairs. The system needs to be expanded to incorporate packaging data and shipping

information in a way that marries the two sets of data and provides the required information. The project to manage the information has been set up as two-phased approach: firstly, to capture product reference information and consolidate the data, i.e. to manage the non-variables, and secondly, to capture and consolidate shipment information and integrate this with phase 1 information. The types of packaging were divided into primary and secondary packaging due to the former being non-variable and the latter being variable and unrelated to individual product. Primary packaging is that which is in immediate contact with the individual product for production prepared for direct shipment, whereas secondary packaging is the overall packaging around multiple product units for bulk shipment

Fig 1. The information requirements for phase 2

Q1:	Is imported secondary packaging always jettisoned, or does it sometimes go to the customer?
Q2:	Is imported primary packaging always jettisoned, or does it sometimes go to the customer?
Q3:	Is shipped in secondary packaging shipped out or replaced (repacked)?
Q4:	Is shipped in primary packaging shipped out or replaced (repacked)?
Q5:	Does shipment go to a UK reseller, UK end-user or is it exported?
Q6:	If the shipment goes to a UK reseller, are they obligated?
Q7:	If despatching organisation acts as a packer/ filler and ships to the customer, who reports pack/ fill obligation?
Q8:	Which products are pack/filled by a third party?

Impending Electronics End-of-Life Legislation

The EC's DGXI (Directorate General for Environment, Nuclear Safety and Civil Protection) has produced a draft Directive aiming to control and prevent waste produced from end of life electrical and electronic equipment (EEE) and to encourage reuse, recycling and recovery of end-of-life EEE in order to minimise its disposal to landfill. A reuse and recycling target for IT equipment is set at a minimum of 70% by weight to be met by 01/01/2004. This target is raised to 90% for CRTs and there is a

requirement to use at least 5% recycled plastics in new equipment. The Directive also aims to improve the environmental performance of treatment options that are available now and in the future. Producers must annually provide information to the Member States on the quantity, number, weight and market saturation of their products.

Collections are to be the responsibility of producers and are to be provided as a free service to end-users, carried out when switching end-of-life EEE for new EEE. Thus, a specific reverse logistics infrastructure would have to be formed. Producers will be responsible for the costs of collection, treatment, recovery and environmentally sound disposal of EEE from private household. Producers can decide whether these costs will be visible or invisible i.e., included within the price of a new product. However, to ensure competitiveness, it is inevitable that companies will reduce their product costs to ensure that the cost of the new product does not increase. The use of certain dangerous materials will be phased out. Materials defined as dangerous include one form of chromium, lead and cadmium, all essential in the manufacture of IT products. The second draft of the Directive will be discussed by the Member States at the beginning of September.

The first steps taken by ICL in response to this legislation have been to set up a programme to assess its suppliers. This assessment programme took the form of independent audits being carried out on all the suppliers that recycle ICL equipment at end-of-life. In order to improve environmental performance and ensure legal compliance, a procedures document was produced and issued to ICL businesses. This procedures document contained a code of practice for ICL businesses when handling end-of-life equipment. In addition, an 'Approved Recyclers Scheme' was set up based on the environmental audits carried out as part of the assessment programme.

3. Environmental Performance Indicators and ISO 14001

One way in which a company can secure its legal compliance and environmental best practice programmes is to implement an EMS. As legislation increases in quantity and scope, a company can use such a system to adapt and improve its environmental

performance. Environment-related performance measurement is neither a new nor a uniform activity. Although there have been several different approaches that have merged to some degree, overall they have developed in isolation from each other and have had different drivers and associated indicators. The lack of synergy is equated to the differences between and within companies.

The ISO 14031 Standard on Environmental Performance Evaluation (EPE) was developed in order to help standardise the measurement of environmental performance across different companies. EPE plays a crucial role in supporting companies' implementation of the EMS standard ISO 14001. Companies without an EMS can also apply 14031 to identify the significant environmental aspects of their operations and to determine which areas need the most improvement. EPE outlines the selection of environmental performance indicators and runs through data collection and analysis, assessment of information against targets and objectives set by management, and reporting the information to interested parties.

An environmental performance measurement system must be founded on key management areas, not just individual indicators. ICL has measured its environmental performance utilising the quantitative targets within the twenty eight targets set by its Corporate Environmental Policy. It has expanded its environmental programmes such that performance measurement incorporates key management areas such as the producer responsibility regulations that cover packaging, electrical and electronic equipment, and batteries. This has yet to be detailed in the company's 1998 targets. ICL's environmental targets for 1994/97 cover nine management areas. The main indicators for each management area and associated target have been identified based on the 1994/97 targets (see fig. 2).

Fig 2. Management Areas and Indicators (based on 1994/97 targets)

Environmental Management Area	Environmental Performance Indicators
Life Cycle of Product	<p>Design</p> <ul style="list-style-type: none"> Number of new low energy consumption with increased processing power products Number of products altered for design for disassembly Number of products utilising recycled plastics Number of hazardous components eliminated <p>Distribution and Packaging</p> <ul style="list-style-type: none"> Weights of packaging removed on delivery Weights of recycled packaging used Number of reusable pallets used Total weights of packaging used Number of CD-ROMs used for software and documentation. <p>End-of-Life</p> <ul style="list-style-type: none"> Weights of equipment taken back for recycling, reuse and refurbishment Weights sent to landfill Number of improvement to recycling processes Weights of recycling data from ICL's operating companies across

	Europe Number and best practice rating of ICL Approved Recyclers
Accreditation and Auditing	Number of ICL sites and businesses ISO 14001 certified Number of sites internally and externally audited
ICL's Suppliers	Number of suppliers ISO 14001/ EMAS certified Number of suppliers with an Environmental Policy
Energy Efficiency	Quantity of energy consumption (electricity, gas and oil) per number of personnel on offices sites
Transport	Numbers of vehicles with catalytic convertors Number of air and road miles saved by video conferencing facilities
Elimination of Waste	Weight of virgin and recycled paper used Quantities of water consumption at metered sites
Recycling of Consumables	Weights of cardboard and paper recycled Weights of plastic cups recycled Number of laser printer units recycled
Training and Awareness	Number of environmental training programmes across Europe Number of environmental action awards given Number of suppliers supported through EMS implementation Number of schemes to promote staff community action for the environment supported

ICL has measured a number of these quantitative targets over the last three years and is now in the position where an assessment of its progress needs to be made and the results of that published in an Environmental Report. From the indicators recommended that have not already been measured a methodology for the data capture needs to be developed. In addition, as previously discussed, the more recent

changes due to the legislative developments and the resulting management programmes will need to be incorporated.

The most difficult factor to deal with, when considering environmental performance measurement within a company and for the purposes of ISO 14001 certification, is that of normalisation. Within ICL, for example, there have been many changes in terms of fluctuations in both the size of the company and the nature of its business. This complicates the assessment process of the data that has been collected within the targets outlined. For example, electricity consumption is directly related to the number of sites and employees, both of which have fluctuated a great deal within the last three years. A standardised measurement, even a crude one, is likely to produce a better quality performance measurement than a single sophisticated measurement.

ICL is making progress with regards to its ISO 14001 certification by one of its businesses, ICL Enterprises (ICL-E). The difficulty with many performance measures that are qualitative in nature is that they are difficult to measure. The three main areas of difficulty, in this respect, have been identified for ICL-E as supplier evaluation, design and purchasing. For example, to take the question of whether a supplier is ISO 14001 certified or possesses an EMS is a start but will not necessarily provide a clear picture of the supplier's environmental performance. To question in further detail becomes difficult because of the diverse nature of supplier businesses.

The problem of purchasing is mainly one of insufficient information provision. Many suppliers do not provide environmental profiles of their products. ICL's Technical Design Authority (TDA) is responsible for assessing products purchased by ICL and has experienced difficulties in requesting specific data from suppliers concerning environmentally related features, such as energy consumption. A supplier's work towards design for the environment is often not visible and again difficult to measure because of its qualitative and diverse nature. Supplier questionnaires need to be detailed in order to be measurable but the result is usually that they are complex and cumbersome to administer. Often, suppliers may find that questions are irrelevant to their business or that they do not know how to answer them.

4. Conclusion

Environmental legislation is the main driving force behind companies improving their environmental performance, whether this be through an EMS or otherwise. In order for improvements to be made, environmental aspects need to be measured and managers provided with hard data to encourage prioritisation against financial equivalents. A company needs to develop a method to measure environmental performance such that continuous improvement can be clearly shown. This is an integral part of achieving and maintaining ISO 14001 certification and, as such, should be high on a company's environmental agenda. How a methodology can be developed, as part of this research project, has been initially to assess the types of performance indicators required.

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Report Number 5

1 APR 1999
ENGINEERING DEPARTMENT

26 Month Report

Introduction

This report is being produced to cover the last two months work since the production of the 2nd year dissertation in order that it, and subsequent reports, are submitted at the same time as the other EngD 1996 intake students' reports. The reason for the project running 4 months behind is that the period 1st July to 31st October was taken as maternity leave. The project is therefore due to be completed by the 31st January 2001.

In response to the 2nd year viva critique carried out in February, a Gantt chart has been produced to complement the objectives and deliverables set out in the 24 month dissertation (see Appendix 1). In addition, these objectives and deliverables have been adjusted slightly to compensate for various changes over the last couple of months.

Work Carried Out

The research has been tracking the changes in the UK Packaging Regulations and a summary document of the amendments announced by Michael Meacher has been written (see Appendix 2). The packaging data for 1998 registration to the Environment Agency has been collated (see Appendix 3). In comparison with 1997 data, the packaging consumption has been reduced overall although this is not reflected in the obligations because of the increase in percentage targets:

ICL's Statement of Obligations (Tonnes)

		1997	1998	1998 Obligations based on 1997 Targets	
Recovery obligation		361.19	385.51	207.76	
Recycling obligation	paper	61.29	46.38	32.47	
	glass	0.00	0	0	
	metals	aluminium	0.00	0	0
		steel	0.34	0.79	0.56
	plastic	4.91	7.50	5.25	

As an overall update on the impacts of legislation on ICL, a document written by the ICL Environmental Affairs Manager (Industrial Supervisor) is attached (see Appendix 4).

An initial programme has been drafted for the ISO 14001 implementation programme (see Appendix 5). Audits will be carried out in parallel with the drafting of generic EMS documentation. Two

preliminary audit visits have been carried out at ICL Retail Systems in Reading and Man05 with a view to carrying out full environmental reviews. Preparatory documentation will be drawn up in order to carry out these environmental reviews based on an analysis of the environmental aspects of business activities and processes.

As part of ICL's environmental awareness campaign, I am writing articles for an ICL environmental newsletter. A copy of the newsletter will be submitted in the next report. In addition, I have written an outline plan for ICL's first Corporate Environmental Report (see Appendix 6).

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Appendix 1

Appendix 1: Gantt Chart of Research Project Objectives and Deliverables

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Appendix 2

Appendix 2: UK Packaging Regulations Amendments

Outline of Michael Meachers statements on the changes:

1: Increase in recovery and recycling targets:

	1999	2000
Recovery	43%	45%
Recycling	10%	13%

2: Drop in the threshold from over £1m turnover to £2m in 2000

3: Wholesaler obligation planned for 2000, under which 'wholesalers' were to take the selling obligation for the small businesses they supply, will be removed from the Regulations

4: Businesses whose main activity is 'selling' will be required to inform consumers about the role they can play in increasing recovery and recycling of packaging waste. A similar requirement will be placed on compliance schemes.

5: The Agencies will be required to publish their monitoring programmes and report half-yearly on numbers, size and sector of businesses monitored for registration, data and compliance with recovery and recycling obligations.

6: The registration deadline for businesses and schemes will be 7 April each year. A revised data form is introduced for immediate use and a number of technical amendments will be made to clarify or simplify existing provisions or deal with unintended omissions. The registration fee will be going up to £900 pa.

Still to be announced:

1: Changes to PRNs

2: Changes to activity obligations

converter from 11 to 9%

packer filler from 36 to 37%

retailer from 47 to 48%

3: Household packaging waste inclusion (not this year)

Wider Policy Objectives

*Information to consumers - legal obligation on sellers

*Minimisation - voluntary targets for business

*Household - further consideration to ways of increasing recovery from this stream

PRNs

*Guidance / Entitlement to PRN

*Transparency

*Process issues need further consultation

*Timing - implementation in 1999

Sectoral Share and Target changes

Moratorium on further changes to share out to 2001

Cross sectoral, independent audit of net compliance costs in 1999

Simplifications

*threshold changes

*wholesaler removal

*simplified data form

*trials with "off the shelf" data forms related to sectors and products

Data and Enforcement

*8,900 businesses now registered

*DETR provisional estimate of packaging waste stream is 8.5mT (9.7mT including wood & other)

*Agencies to publish monitoring programmes half yearly on number, size and sector of businesses checked for:

- registration

- data

- compliance with recycling and recovery obligations

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Appendix 3

Appendix 3: ICL's 1998 Packaging Data for EA Registration

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	465	0	0	0	62 3	243	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	182 451	0	0	11 455	43 958	313 232	0
selling	904 498	0	0	11 605	136 691	514 842	0

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	28 3266	0	0	1 99	7 55	17 621	0
selling	50 3666	0	0	2	10 3	19 121	0

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	0	0	0	0	0	0	0
selling	0	0	0	0	0	0	0

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	9 291	0	0	0 011	0 708	4 846	0
selling	13 975	0	0	0 011	1 238	4 846	0
transit packaging around imports	5 1	0	0	0	1 7	7	0

Table 4: Re-Use (optional)

Paper		1 203
Glass		0
Metals	aluminium	0
	steel	0
Plastics		0 578
Wood from 1 1 2000		0 8
Other from 1 1 2000		0

Table 5: Composites (optional)

Paper		0
Glass		0
Metals	aluminium	0
	steel	0
Plastics		0
Wood from 1 1 2000		0
Other from 1 1 2000		0

Table 6: Levels of Recovery and Recycling

Recovery			0	
Recycling	paper		31 339	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		0	
			0	

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			385 5081	
Recycling obligation	paper		46 38128	
	glass		0	
	metals	aluminium		0
		steel		0 792945
	plastic		7 498715	
			0	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	449 7265	0	0	7 92175	72 51065	339 4088		0
Imports obl. (Roll-up)	14 08622	0	0	0 0077	2 4765	10 3922		0
Total Recv. obl.	199 4395	0	0	3 409664	32 24447	150 4144		0
Total Recl. obl.	46.38128	0	0	0.792946	7.498716	34.9801		0

Table 1: Packaging Supplied

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling selling	30 399			5 587	0 8	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling selling						

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling selling						

Table 3: Packaging Imported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling selling						
transit packaging around imports						

Table 4: Re-Use (optional)

Paper		0 38
Glass		
Metals	aluminium steel	
Plastics		
Wood from 1 1 2000		0 8
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		30 019
	glass		
	metals	aluminium steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			7 434451
Recycling obligation	paper		1 428753
	glass		0
	metals	aluminium steel	0
	plastic		0 262589

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	14 28753	0	0	0	2 62589	0 376	0	0
Imports obl. (Roll-up)	0	0	0	0	0	0	0	0
Total Recv. obl.	6 143638	0	0	0	1 129133	0 16168	0	7.434451
Total Recl. obl.	1.428753	0	0	0	0.262589	0.0376	0	0

Table 1: Packaging Supplied

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling	0.715		0.011	0.018	0.376	
selling	0.715		0.011	0.018	0.376	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling						
selling						

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling						
selling						

Table 3: Packaging Imported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling	0.714		0.011	0.018	0.378	
selling	0.714		0.011	0.018	0.378	
transit packaging around imports						

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			0.736547
Recycling obligation	paper		0.109325
	glass		0
	metals	aluminium	0
		steel	0.001683
	plastic		0.002754

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	0.59345	0	0	0.00913	0.01494	0.31208	0	
Imports obl. (Roll-up)	0.4998	0	0	0.0077	0.0126	0.2632	0	
Total Recv. obl.	0.470098	0	0	0.007237	0.011842	0.24737	0	0.736647
Total Recl. obl.	0.109326	0	0	0.001683	0.002764	0.067628	0	

Table 1: Packaging Supplied

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling	19 944		11 124	3 841	43 456	
selling	19 944		11 124	3 841	43 456	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling	3 669		1 97	0 614	8 171	
selling	3 669		1 97	0 614	8 171	

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling						
selling						

Table 3: Packaging Imported

	paper	glass	metal aluminium steel	plastic	wood	other
wholesaler						
wholesaler*						
pack/ filling	2 037				4 47	
selling	2 037				4 47	
transit packaging around imports						

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			24 77915
Recycling obligation	paper		1 493415
	glass		0
	metals	aluminium	0
		steel	0 759782
	plastic		0 267841

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	13 50825	0	0	7 59782	2 67841	29 28655	0	
Imports obl. (Roll-up)	1 4259	0	0	0	0	3 129	0	
Total Recv. obl.	6 421685	0	0	3 267063	1 151716	13 93869	0	24.77916
Total Recl. obl.	1.493416	0	0	0.759782	0.267841	3.241666	0	

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	2 168				0 096		

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling	0 324				0 07		
transit packaging around imports							

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery				
Recycling	paper		1 32	
	glass			
	metals	aluminium		
		steel		
	plastic			

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			0 547347	
Recycling obligation	paper		0 119068	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		0 008222	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Actobl.	1 01896	0	0	0	0 04512	0	0	
Imports obl. (Roll-up)	0 17172	0	0	0	0 0371	0	0	
Total Recv. obl.	0 511992	0	0	0	0 035355	0	0	0 647347
Total Recl. obl.	0 119068	0	0	0	0 008222	0	0	

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	75.6			0.32	16.88		18
selling	127.68			0.47	19.73		18.81

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	21.27			0.02	4.67		1.17
selling	40.01			0.03	6.92		1.67

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	8.54				0.68		
selling	10.9				1.15		
transit packaging around imports	5.1				1.7		7

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			46.02075	
Recycling obligation	paper		7.27525	
	glass		0	
	metals	aluminium		0
		steel		0.03148
	plastic		1.28431	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	60.7637	0	0	0.3148	10.4163	14.1146	0	
Imports obl. (Roll-up)	11.9888	0	0	0	2.4268	7	0	
Total Recv. obl.	31.28358	0	0	0.135364	5.522533	9.079278	0	46.02076
Total Recl. obl.	7.27526	0	0	0.03148	1.28431	2.11146	0	

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	10 292				7 219	36 4	
selling	10 292				7 219	36 4	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	3 0876				2 166	7 28	
selling	3 0876				2 166	7 28	

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports							

Table 4: Re-Use (optional)

Paper		0 823
Glass		
Metals	aluminium	
	steel	
Plastics		0 578
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery				
Recycling	paper			
	glass			
	metals	aluminium		
		steel		
	plastic			

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			14 76759	
Recycling obligation	paper		0 597965	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		0 419399	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
AcLobl.	5 979652	0	0	0	4 19399	24 1696	0	0
Imports obl. (Roll-up)	0	0	0	0	0	0	0	0
Total Recv. obl.	2 57125	0	0	0	1 803416	10 39293	0	14.76769
Total Recl. obl.	0.597965	0	0	0	0.419399	2.41696	0	0

Table 1: Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	465				62 3	243	
wholesaler*							
pack/ filling	55 9				16	215	
selling	713 3				100 2	415	

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling	0 3				0 1	1	
selling	3 6				0 6	2	

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							

Table 3: Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler							
wholesaler*							
pack/ filling							
selling							
transit packaging around imports							

Table 4: Re-Use (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 5: Composites (optional)

Paper		
Glass		
Metals	aluminium	
	steel	
Plastics		
Wood from 1 1 2000		
Other from 1 1 2000		

Table 6: Levels of Recovery and Recycling

Recovery			
Recycling	paper		
	glass		
	metals	aluminium	
		steel	
	plastic		

Table 7: Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			291 2222	
Recycling obligation	paper		35 3575	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		5 2536	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act.obl.	353 575	0	0	0	52 536	271 15		0
Imports obl. (Roll-up)	0	0	0	0	0	0		0
Total Recv. obl.	152 0373	0	0	0	22 59048	116 5945		0 291.2222
Total Recl. obl.	35.3575	0	0	0	5.2536	27.115		0

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Appendix 4

Appendix 4: Opportunities and Threats To ICL Posed by Environmental Legislation

OPPORTUNITIES AND THREATS TO ICL POSED BY ENVIRONMENTAL LEGISLATION

1. SCOPE

1.1 Legislation

The main areas of current environmental activity, together with proposed, planned or implemented legislation which either already has an impact on ICL and its operations or which will affect ICL in the future are examined below.

Within each of these areas there are a range of issues both political and environmental which need to be considered and these will be covered below together with a resumé of the actions already taken and those required.

1.2 EU and HMG's emerging thinking

Whilst we track closely and are intimately involved with (from the business and trade association perspective) the European Union's environmental legislation processes, we also keep close to the evolving thinking of the EU and HMG on environmental issues including the relationships between sustainability, economic growth and the quality of life and industry's role in achieving progress in these areas. In particular, HMG's response to the latest report from the Government Panel on Sustainable Development and the EU's plans for Integrated Product Policy, with regard to areas which affect ICL, are also reflected in the content of this document.

2. MAIN ISSUES OF CONCERN TO ICL

- 2.1 waste including end-of-life electronics (see Section 4.1)
- 2.2 packaging (both our own and that of our suppliers) (see Section 4.2)
- 2.3 eco-labels and eco declarations (see Section 4.3)
- 2.4 energy efficiency (see Section 4.4)
- 2.5 green public procurement (see Section 4.5)
- 2.6 hazardous materials and restricted substances, including the implications of greening our own supply chain (see Section 4.6)
- 2.7 liability including contaminated land (see Section 4.7)
- 2.8 environmental management certification (ISO 14001) and integrated product policy (see Section 4.8)
- 2.9 transport (see Section 4.9)
- 2.10 producer responsibility and design issues (see Section 4.10)
- 2.11 emissions to water, air and land (see Section 4.11)

3. ICL'S APPROACH TO THE ENVIRONMENT

- 3.1 Pro-active** Our environmental stance is pro-active, we anticipate legislation and take action well in advance (e.g., our work in anticipation of the WEEE Directive). The main advantage of this is that it signals to our stakeholders that we can deal with environmental challenges to our and their advantage and at least cost. This approach also allows us to become involved in the debate with HMG and EU legislators on the best way to achieve environmental goals in the electronics industry.
- 3.2 Responsible and responsive** We take the lead in environmental fora (FEI, ICER, Eurobit, Orgalime). We work in partnership with customers and SMEs to achieve better environmental impacts.
- 3.3 Low cost** We achieve results with few resources due to a targeted approach.

4. REPORT ON ISSUES, ACTIONS TAKEN AND ACTIONS REQUIRED

4.1 END OF LIFE ELECTRONICS

Status: Draft directive presently with the Commission, expected to be EU law by 2002. National legislation will be implemented in ten of the fifteen EU countries by 2001.

Issues: Producer responsibility rather than shared responsibility; enormous costs anticipated re problem of historical waste, logistical problems.

Actions taken: One ICL Approach - 3R Project. Setting up customised take-back programmes with customer involvement (e.g., Marks & Spencer). Active lobbying in Brussels, Eurobit, Orgalime, ICER and FEI. Close involvement with DTI Recycling Policy Unit. Setting up of own programmes of Best Practice, we are now considered to be a market leader in electronics recycling due to the ICL Recycle Programme.

Actions required: Audit existing practices in all ICL operations in EU member state and application countries; estimation of financial liabilities; ramp-up take-back with increased customer involvement - partnership approach.

4.2 PACKAGING

Status: EU Packaging Directive in force since 1994, legislation now implemented throughout Europe. UK most draconian legislation to date, and tough changes expected.

Issues: Different methodologies in all EU member states. The EU Directive calls for packaging reduction, marking and restricted materials content.

Action taken: Packaging working group set up in UK to reduce packaging around products. Feasibility study for amendments and extensions to the 3PI database to include packaging metrics of all products, including those bought-in. Investment in new technology to reduce packaging and to deal with packaging waste arising on ICL sites, thus complying with UK legislation at lowest cost and reducing waste management costs. Supply chain interfaces being established.

Action required: Audit existing practice in all ICL operations in EU member state and application countries with regard to waste packaging, packaging reduction and packaging use. Estimate additional costs for whole ICL group.

4.3 ECO-LABELS

Status: EU eco-label for PCs from 1999 onwards. EU eco-label for printers and laptops 2000/2001. Many national eco label schemes, e.g., Scandinavian White Swan, German Blue Angel. Self-declaration approach: ECMA TR70, SITO declaration.

Issues: Green procurement by public and private sector, artificial trade barriers. Risks inherent in sourced product offerings over which ICL has no control re the acquisition of the relevant eco-label.

Action taken: Adoption of TR70, active on TR70 committee, although implementation of TR70 reports not yet successful due to lack of interest from businesses.

Action required: Audit of all ICL products and major sourced products and their eco-label status. TR70 reports on ICL products and the publication of these on web-site (as IBM have done).

4.4 ENERGY EFFICIENCY OF PRODUCTS

Status: The Energy Star Programme is now a defacto standard for PCs, printers and monitors. A major promotional campaign for Energy Star will be launched during 1999.

Issues: Public and private procurement increasingly demanding Energy Star. Sourced products must conform to Energy Star Programme. Some suppliers now aiming to achieve marketing advantage by exceeding Energy Star. Conflicts between Energy Star requirements and EU eco-label requirements.

Action taken: Close monitoring of situation within ECMA TC38, Eurobit etc.

Action required: As for eco-labels.

4.5 GREEN PUBLIC PROCUREMENT

Status: OECD guidelines are directed at large corporates and public authorities. Increasing uptake of ISO 14001 certification is resulting in more stringent public and private procurement requirements.

Issues: Supply chain implications - risk re sourced product.

Action taken: Purchasing community workshops. Monitoring and lobbying, environmental input to ITTs, publicity and awareness of ICL's environmental stance and achievements.

Action required: ISO 14001 certification.

4.6 HAZARDOUS MATERIALS AND RESTRICTED SUBSTANCES

Status: Hazardous materials restrictions and bans are now being enacted in a major wave of harmonised EU and national legislation aimed at products and companies.

Issues: Targeted at lead solder, major cost implications, halogenated flame retardants, hexavalent chromium etc., presenting a new set of challenges to our supply chain approach and major cost implications.

Action taken: These issues are contained within the WEEE Directive (together with other pieces of legislation, including the new batteries directive and the packaging directives). As such they are being dealt with as in 4.1.

Action required: As above in 4.5.

4.7 LIABILITY

Status: Lugano Convention - sleeping. Contaminated land, EU legislation and member state legislation but not yet actively implemented.

Issues: Fear of US Super Fund approach which would impose enormous costs.

Action taken: Environmental audit programme

Action required: Careful environmental audit of all sites, products, processes. ISO 14001 certification.

4.8 ENVIRONMENTAL MANAGEMENT CERTIFICATION (ISO 14001) EMAS AND INTEGRATED PRODUCT POLICY

Status: ISO 14001 becoming a de facto standard, see mentions above. Integrated Product Policy (IPP) is in the development stage, but Labour Government is showing great interest and a pro-active approach. IPP will ensure that companies have to take a life cycle assessment (LCA) approach to all its products and services. The Commission has proposed a direct linkage between ISO 14001 and EMAS (stronger than the present bridge) and the revised EMAS adopts a more flexible approach to environmental reporting and also requires greater employee involvement.

Issues: Over-regulation of activities adds cost and bureaucracy, but failure to achieve ISO 14001 and IPP would result in loss of marketing edge.

Action taken: Some ISO 14001 pilot projects underway. Close monitoring of IPP.

Action required: Dedicated ISO 14001 project.

4.9 TRANSPORT

Status: Key area for both Brussels and HMG aligned to climate change and Kyoto commitments. Little or no proposed legislation from the EU in this area - after committing to the Kyoto principles they will expect member states to implement mechanisms for meeting the commitments. HMG's White Paper on Integrated Transport Policy involves proposals which do not require legislation, as enabling legislation is in place.

Issues: Employee parking taxes could be a heavy cost for us, particularly as in the main our sites are not close to public transport and therefore a reduction in the provision of employee parking facilities would not be possible. Lack of a far reaching environmental transport policy other than our outsourcing of freighting to environmental providers and business miles avoidance tactics. HMG's fiscal policy with regard to lower taxation of company cars pro rata to number of business miles travelled provides no incentive for our staff to reduce the number of business miles travelled. Present government's tougher approach to transport issues could entail greater costs.

Actions taken: Inclusion in environmental policy and targets of measures to increase video conferencing, measurement of these as business miles saved.

Actions required: This whole area is under scrutiny against possible EU developments and HMG's approach.

4.10 **Producer Responsibility, Extended Producer Responsibility and Design Issues**

Status: Producer Responsibility is inherent in all current and pending EU environmental legislation. As such, design issues which involve the producer ensuring the environmental design (including the lowest possible environmental impact of products and services in manufacture, delivery, use and disposal) of all products and services are becoming more important. There is a shift from producer responsibility to extended producer responsibility back by the OECD.

Issues: ICL's status as a systems integrator gives us a key role in ensuring that our suppliers understand and comply with the requirements of producer responsibility and good environmental design. Extended producer responsibility will put greater emphasis on our involvement in these areas.

Actions taken: Our new corporate environmental policy includes these issues.

Actions required: ISO 14001 certification.

4.11 EMISSIONS TO WATER, AIR AND LAND

Status: Key areas for Brussels and HMG aligned to climate change and Kyoto commitments.

Issues: Tough environmental legislation and the possibility that ISO 14001 and/or EMAS will become mandatory for all commercial organisations over a certain size.

Actions taken: Monitoring of emerging legislation, including transport legislation.

Actions required: ISO 14001 certification.

Joy Boyce, Valentine Herman
Corporate Affairs

January 1999

ref: jgb/projects/dec98esb.2

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Appendix 5

Appendix 5: ISO 14001 Audit Implementation Plan

Background

ITTs (Invitations to Tender) and BID documents are increasingly concerned with ICL's commitment to environmental management and enquiring whether ICL has systems in place and whether it is ISO 14001 certified. Gaining ISO 14001 certification is going to become paramount in the future as it is becoming a supply chain management issue. ISO 14001 is high on Fujitsu's agenda and as ICL is now its wholly owned subsidiary, certification to the standard is important for this relationship. Since ICL sold its manufacturing arm, it has lost the environmental management certifications, BS7750, EMAS, and ISO 14001, that it had achieved on the associated site. Michael Meacher's intentions to mandate Corporate Environmental Reporting will make these environmental commitments, or lack of, transparent to the stakeholder. The risks of damage to ICL business as a result of environmental liabilities can be considerably reduced by the implementation of an effective environmental management system and ISO 14001 certification.

Audits to date

Slough 06

D2D consultancy audit with ICLE Quality Management and CEA - Health and Safety oriented environmental review

EngD team (Research Council funded), Brunel University - Environmental Review

Stevenage

MSc team, Brunel University - Waste Measurement Review - Packaging legislation tailored for data generation. Covered all the Stevenage sites.

Warrington

CEA carried out waste review of CLC warehouse

Environmental Auditors Trained

Elaine Bluck
Joy Boyce
Balbir Chahal
Gail Collins
Dave Fawcett
Brian Parker
Ron Powell

Staff to be trained as Environmental Auditors

Geoff Houghton
Tony Lake
Gilly Newman
Victoria Parker

Staff to be approached for training

Lorraine Campbell, Quality Manager, Warrington

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Appendix 6

Appendix 6: Corporate Environmental Report Plan

Chairman's Statement

'ICL's Corporate Environmental Affairs Mission Statement'

Joy Boyce, Corporate Environmental Affairs Manager

Introduction: ICL's commitment to quality and impact on society
Environmental Policy and Targets
ICL's Environmental Programmes
Outline of Report (Sections outlined as below)

Sections:

- 1 Energy Conservation
- 2 Waste Management
 - 2.1 Office waste recycling - plastic cups (save a cup scheme)
 - paper and cardboard recycling
 - printer consumables
 - 2.2 UK Producer Responsibility (Packaging and Packaging Waste) Regulations 1997
 - Waste measurement audits
 - Packaging minimisation initiatives
 - Data management
 - 2.3 End-of-life IT recycling
 - recyclers accreditation scheme
 - IT waste audit trails
- 3 Environmental Design
 - Cranfield University project
 - life cycle of product
- 4 ISO14001
 - ICL Green Teams
 - awareness campaigns
 - auditor training
 - supply chain management
- 5 Transport and communications
 - videoconferencing
 - homeworking
 - ICL fleet (catalytic convertors, unleaded)
- 6 Electronics industry bodies
 - ICER chairman
 - FEI
 - Eurobit

Future goals (1999 policy and targets), impacts on society and sustainable development

Feedback questionnaire

Notes: * Referenced in ICL's annual report * Data from 94-97

Report Number 6

32 Month Report

1. Introduction

The main aim of the research project is to establish an infrastructure for the management of corporate environmental information within a multinational information technology business, using ICL plc. as an example.

This 32 month report covers the work carried out over the last six months which has concentrated on developing environmental performance indicators for an information technology company, using ICL plc as an example. Furthermore, how the indicators can be developed in accordance with the ISO 14031 standard on environmental performance evaluation has been considered. The result of this study has been the identification of the many drivers and benefits that environmental performance evaluation give rise to. The outcome of this has been detailed in the paper written for the EngD Conference 1999 (see Annex 1).

It is an objective of the research project that these performance indicators be integrated into the processes and procedures of the company's environmental management system such that the company can demonstrate continuous improvement. This enables an organisation to not only obtain ISO 14001 certification but to maintain its certification year on year. As a foundation to this, the work over the last six months has involved writing the first set of generic environmental management system documentation incorporating environmental performance indicators and measures. These documents have been included in the report (see Annex 2).

As part of the objective to track the impacts of current and future environmental legislation on the information requirements of a multinational information technology business, the research has continued to evaluate the impacts of environmental legislation, especially the UK Packaging Regulations, on ICL (Annex 3).

2. Summary of Progress (Based on Appendix 2 of 24 month dissertation)

Each objective is laid out as follows:

Objectives

Deliverable

Dates

Progress

2.1 To review the environmental information requirements and flows within a multinational information technology business.

1) Develop model of information flows within the company and industry

Completed 31/9/96

To be refined 30/7/1999

This has not been refined yet due to developments within the supply chain functions of ICL. These changes within ICL are expected to be completed for most ICL businesses during the early part of next year. The initiative, called the 'Global Supply Chain' will mean that the supply chain function for the procurement of hardware and software for different ICL businesses will be brought together, even though the individual businesses involved will continue to operate as separate, financial units. This represents an interesting move back towards centralisation of business functions and has important implications for the data collection necessary for compliance to the UK Packaging Legislation. With respect to this new development the model will be refined by 1/5/2000.

2) Review CEA activities and environmental status of environmental data collection

Completed 31/9/97

2.2 To review the impacts of current and future environmental legislation on the information requirements and environmental performance of the company.

1) Review environmental legislation directly relating to ICL's operations.

Completed 31/9/96

Updated 31/9/97

Update completed (see Annex 3, Appendix 1)

2) Review packaging legislative information requirements.

Completed 31/9/96

Updated 31/9/97

Update to be completed 30/7/99 (See Annex 3, Appendix 2)

3) Packaging legislation's impact on ICL's environmental performance.

Completed 31/9/98

Review to be updated by 1/10/99 (See Annex 3, Appendix 3)

2.3 To design, develop and implement a system for ICL to meet the environmental information requirements reviewed with particular emphasis on legislative demands.

1) Produce packaging legislation information requirements logic model
Completed 31/3/98

2) Integrate information into ICL's information systems and establish necessary communication channels, including suppliers
To be completed by 1/12/99

4) Framework development for information infrastructure, including software applications where necessary
To be completed by 30/9/2000

2.4 To apply the current knowledge on environment-related performance measurement to ICL's information needs to ensure the organisation has practical tools with which to meet its Corporate Policy and Targets. To develop appropriate relative and normalisation techniques to performance measurement within ICL.

1) Assessment of current literature on environmental performance measures
Completed 15/1/99

2) Assess case studies of the applications of performance indicators
To be completed by 30/3/99
Still in progress, to be completed by 30/1/2000

3) Application to ICL's performance evaluation requirements
To be completed by 30/3/2000

4) Development of measures, incorporating techniques
To be completed by 28/5/99
Still in Progress, to be completed by 30/2/99

2.5 To integrate such environmental performance measurement into the process of ISO14001 implementation within the company. To ensure that such measures facilitate continuous improvement programs within ISO 14001.

1) Production of generic literature to support ISO 14001 incorporating performance measures
To be completed by 30/7/99
This work is still in progress. Progress to date is in Annex 2.
To be completed by 30/3/2000

2) Review measures robustness in demonstrating continuous improvement against company targets
To be completed by 31/7/2000

- 3) Assess measures capacity to meet ICL's stakeholder and reporting requirements, including benchmarking
To be completed by 31/7/2000

2.6 Publish papers relevant to research focus in academically vetted journals within four months of completed research

- 1) The impact of packaging legislation on a companies environmental performance - case study of ICL's approach

(to include waste sampling and measurement

This is now in draft (previous deadline: 30/9/99, expected new deadline: 30/11/99)

- 3) Paper on the use of environmental performance measures in ISO 14001 for continuous improvement in the IT industry
To be submitted by 29/9/2000

3. Summary of Future Work

- Track developments of the Global Supply Chain initiative within ICL and its implications for packaging data management and update information flow model
- Set-up of supply chain channels of communication for packaging data
- The packaging database project is to be continued with a new contact and a new system (3PI is to be replaced with Enterprise Reference Service, ERS)
- Track impacts of legislative changes, especially the UK Packaging Regulations, on the information requirements of companies like ICL and the impacts on their environmental performance. As part of this it is intended that a study be carried out on the effects of compliance scheme membership on companies' environmental performance.
- Write up EPI case studies
- Continue to develop ICL's EPIs
- Continue to develop ICL's generic EMS documentation to include Environmental Performance Indicators Manual and Procedures for Environmental Performance Measurement
- Complete paper on the UK Packaging Regulations

Report Number 6

Annex 1

Annex 1
EngD Conference Paper 1999:
“Developing Environmental Performance Indicators for an
Information Technology Systems and Services Company”

DEVELOPING ENVIRONMENTAL PERFORMANCE INDICATORS FOR AN INFORMATION TECHNOLOGY SYSTEMS AND SERVICES COMPANY

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Abstract

Improved measurement and tracking of environmental performance should be part of the regular business functions and activities of any organisation. However, it requires a set of environmental performance indicators that can be applied to the particular organisation's unique functions and business culture. During the third year, this research project has concentrated on the development of environmental performance indicators (EPIs) using ICL (International Computers Limited) as an example. Environmental performance indicators have been developed, based on the company's environmental policy and targets, and a framework for their measurement outlined. Being a non-manufacturing information technology systems and services company, supply chain management is an important issue for the company and performance indicator identification has had to focus on this area.

ISO 14001 certification requires that certified companies demonstrate continuous improvement in their environmental performance. Therefore, as part of ICL's commitment to implement ISO 14001, the performance indicators have been developed in order that the company can demonstrate continuous improvement year on year. The process by which such performance indicators can be incorporated into a company's generic environmental management system and ISO 14001 programmes has been developed. The study has concentrated on environmental performance in terms of operational indicators and related outcomes and has not reviewed performance in terms of management effort or expertise. The results show that a simple and logical methodology can be applied to identify operational EPIs that are compatible with ISO 14031. In addition, such EPIs can be utilised in the assessment of trends in environmental performance and to demonstrate continuous improvement for the purposes of ISO 14001 certification in an information technology systems and services organisation.

Key words: Environmental Performance Indicators, ISO 14001/ 31, Environmental Management Systems

Introduction – Drivers for Environmental Performance Measures

As in a range of other industries, environmental performance within the information technology sector has developed increasing importance in recent years. This is due to companies recognising the impact their businesses are having on the environment. Increasingly, stakeholders are not only showing interest in the improvements a company is making in its environmental performance but are also demanding information that demonstrates environmental best practice and management. Such interest by stakeholders derives from the fact that those companies which successfully develop environmental performance evaluation methods will improve their competitiveness and indicate in a broader sense their management and business performance abilities. Associated with this demand for improved environmental performance is

the need to report or communicate the levels of environmental performance being achieved. This is especially so for companies implementing ISO 14001 where continuous improvement in environmental performance is a requirement and can only be demonstrated via the evaluation and measurement of performance¹. It is often the case that the decision by an organisation to produce an environmental report is the first time that the organisation has truly understood that clear measures of environmental performance are required for environmental improvements to be shown to have been made. The pressure on companies to produce environmental reports is set to increase with recent statements by Michael Meacher, the UK's Environment Minister, indicating the intention to make corporate environmental reporting mandatory. The requirement under ISO 14001 to demonstrate continuous improvement in environmental protection is adding to the pressure on companies to develop sound measures of environmental performance. This is because companies will need to maintain their certification year on year, thereby protecting the investment made, by showing that they have continuously improved. The environmental performance evaluation standard, ISO 14031, is currently in draft format and it provides guidelines to companies that are developing their own set of EPIs².

The 1990s have been called by some the decade of the merger and this is reflective of the increasing rate of change in the size of many organisations. Companies are constantly changing both their shape and their business functions. For example, ICL has moved towards the provision of services and away from manufacturing. These organisational changes result in the need for environmental performance measures that are related to business size and function and as such can reflect the real rate of environmental improvements. The increasing pressure from legislation has led to many organisations having to measure previously unaccounted for environmental impacts. A good example of this has been the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 that has required extensive data provision on packaging-related material consumption which would otherwise remain an unknown measure. It is arguable that without such legislation, companies would not adopt an environmental performance indicator for packaging materials because of the lack of previously available data and the extensive resources that are required to implement the necessary measurement systems³. There is also the perception that packaging is benign and, therefore, not an environmental problem. Finally, drivers with a direct economic link or consequence that can be equated to demands for improved performance clearly exist across industry. An example of this is that by optimising logistics, a company can reduce its transportation impacts and thereby minimise the associated costs and environmental impacts.

Environmental Indicator Selection

One way in which a company goes about identifying performance indicators is on the basis of reviewing currently available Corporate Environmental Reports produced by a range of other industries^{4,5}. In this way, a company can identify which indicators are relevant to its own environmental impacts on the basis of which categories of indicators are in common usage. However, increasingly it is being shown that indicator selection and the development of performance evaluation measures is a complex process that requires careful planning and a structured approach^{4,5}. If a company relies on identifying indicators on the basis of those used by others, the initial process of identifying significant aspects may be inadequate. This could result in a lack of emphasis on the measurement of important aspects or worse still, an aspect

being omitted entirely. The identification of significant aspects demands an understanding of the following:

- Risk of environmental impacts on the surrounding areas
- Risk of environmental impacts evolving from products
- Risk of environmental impacts evolving from processes
- How the above are inter-related and the implications for collating/aggregating the significance of different business activities

In addition, not only do the environmental aspects need to be understood but the measures also then have to be re-prioritised according to drivers such as legal or stakeholder pressures and the constraints of limited resources. Within this, consideration needs to be given as to how and where the data needs to be gathered and how the data can be used internally to provide the necessary tools for enabling continuous improvement and its effective communication.

According to the ISO 14031 guidelines on environmental performance evaluation there should be three basic types of indicator, Environmental Condition Indicators (ECIs) and Environmental Performance Indicators (EPIs) which is then further divided into Operation Performance Indicators (OPIs) and Management Performance Indicators (MPIs). Figure 1 shows the relationship between the three major categories of indicator and their functionality within the sphere of the organisation, the environment and EPE. ISO 14031 additionally identifies five types of quantitative measure, defined in terms of the basis of their calculation. These are: direct, relative, indexed, aggregated and weighted. Direct data is basic data or information such as tonnes of waste produced. Relative measures are direct data that has been related to another parameter such as tonnes of waste produced per tonne of product manufactured. Indexed data or information is that which is converted into units or to a form that relates the information to a given baseline or standard and is often used for air emissions. Aggregated data is data of the same type that has been collected from different sources and added together. Finally, weighted data is 'data or information that has been modified by applying a factor relating to its significance'². These definitions should hopefully facilitate a common usage of terms as to date there has been a substantial number of differently defined and used terms for various EPIs.

A recent study carried out by James and Bennett⁶ provides a good description of the relationship between the ISO 14031 model and current practice. The study showed that only a small majority of those surveyed used any kind of ECI, the most common being biological oxygen demand (BOD) and (COD) indicators of the impacts of effluents into watercourses. This is unsurprising as they are, in most instances, the most difficult to measure. The study also showed that most EPE activity is still focused on OPIs and particularly resource, emissions and wastes indicators. This is probably because the aspects that they measure are highly visible and the necessary data is usually readily available somewhere within the organisation. It is foreseeable that there will be significant further developments in the types and applications of EPIs in future years. Standardisation of EPIs for the purposes of comparability is a complex issue to address. It is thought that standardisation should not mean that all companies report on the same information but that the overall structure of the documents should be harmonised and the main classes of indicators defined⁷. ISO 14031 has been criticised for not meeting the need for this type of standardisation and for not addressing implementation issues, i.e. how key indicators might be

measured⁸. As such, although its intentions may be complementary to, it is lacking in its more functional support of the EMS standard ISO 14001.

Figure 1: EPE Evaluation Areas and their Interrelationships

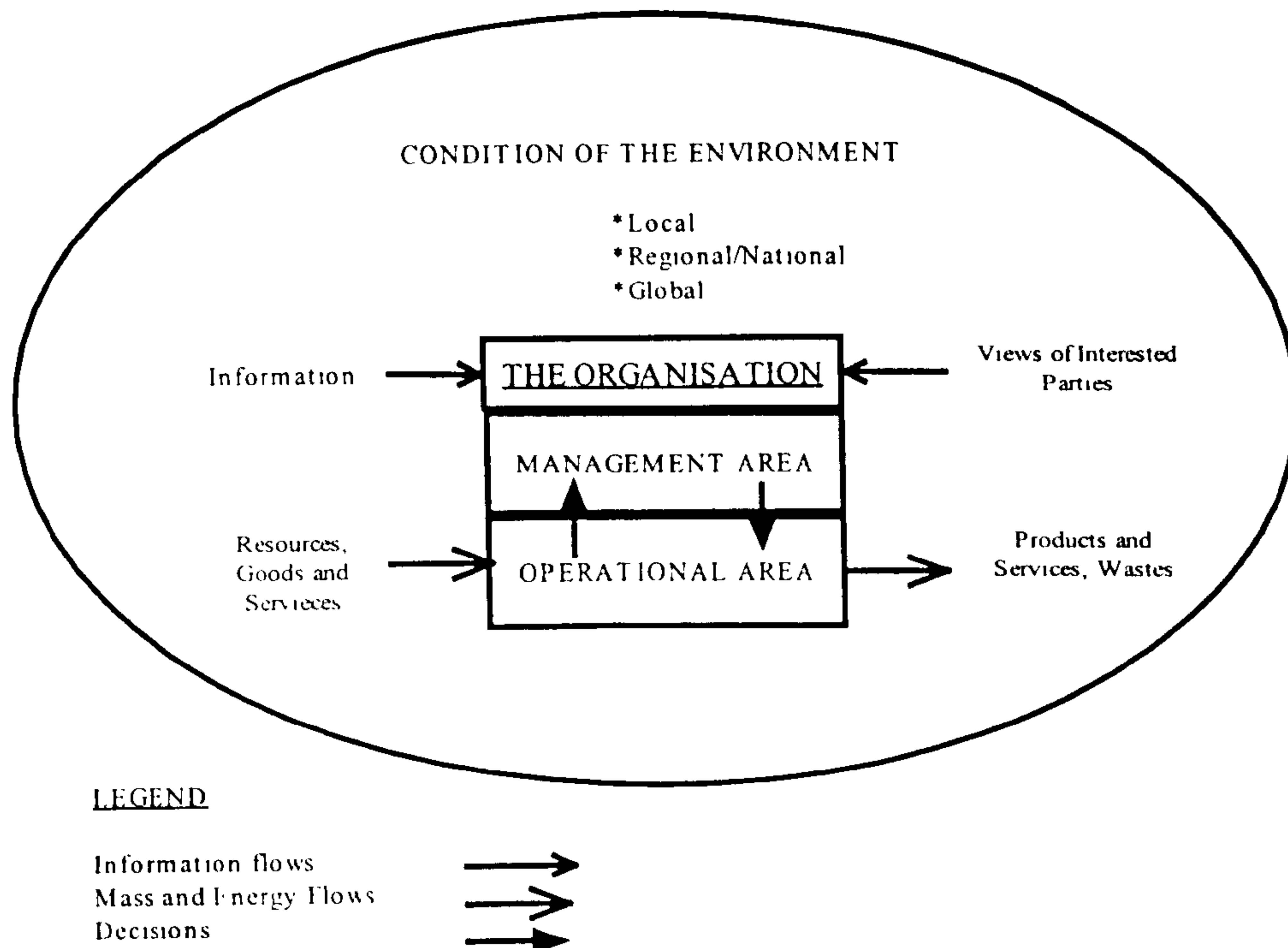


Figure from ISO/WD 14031.5 (1996)

Once EPIs have been identified and agreed within an organisation, standard methods for their measurement need to be determined and communicated across the organisation. As there is nothing in the ISO 14031 standard that describes how various EPIs may be measured it is down to individual companies to adopt their own methodologies and there are various studies showing different approaches used^{4,5}.

Environmental Performance Indicators for an IT Systems and Services Company

In order for ICL to assess its environmental performance, EPIs have been identified based on the Corporate Environmental Policy and Targets as set in 1994/7³ that are compatible with ISO 14031. On the basis of this the indicators have been assessed in terms of which are currently measured and which will need measurement systems to be set up. A table has been designed to show the drivers behind different indicators and which measurement systems will, therefore, be feasible to implement (Table 1).

Table 1. Continued... (Table showing EPIs and Measurement Systems Feasibility)

Environmental Management Area	Environmental Performance Indicators	Drivers of Actual EPIs	Drivers of Potential EPIs	Units of Measure
Accreditation and Auditing	Number of ICL sites and businesses ISO 14001 certified Number of sites internally and externally audited	R, C & I	I	
ICL's Suppliers	Number of suppliers ISO 14001/ EMAS certified Number of suppliers with an Environmental Policy		R I R I	
Energy Efficiency	Quantity of energy consumption (electricity, gas and oil) on office sites Quantity of energy consumption (electricity, gas and oil) on warehouse sites	C R (L) C R (L)		kg NO _x kg SO _x kg CO ₂
Transport	Numbers of vehicles with catalytic convertors Number of air and road miles saved by video conferencing facilities Business miles travelled Logistics (of product) miles travelled	R B R (C) R Sk & (C)		kg CO ₂ kg CO ₂ kg CO ₂
Elimination of Waste	Weight of waste to landfill Quantities of water consumption at metered sites		R C R C	kg '000 m ³
Recycling of Consumables	Weights of cardboard recycled Weights of plastic recycled Weights of paper recycled Weights of plastic cups recycled Number of laser printer units recycled	L (Sk) L (Sk) R (Sk) R (Sk) R (Sk)		kg kg kg kg
Training and Awareness	Number of environmental training programmes across Europe Number of environmental action awards given Number of suppliers supported through EMS implementation Number of schemes involving community action for the environment		Sk (R) Sk (R) Sk (R) Sk (R)	
Costs	Environment Agency Fees Environmental Taxes (e.g. Climate change levy) Running of Environment Affairs Dept. Regulatory Compliance Programmes	L L L	L (Sk) R (Sk)	£ £ £

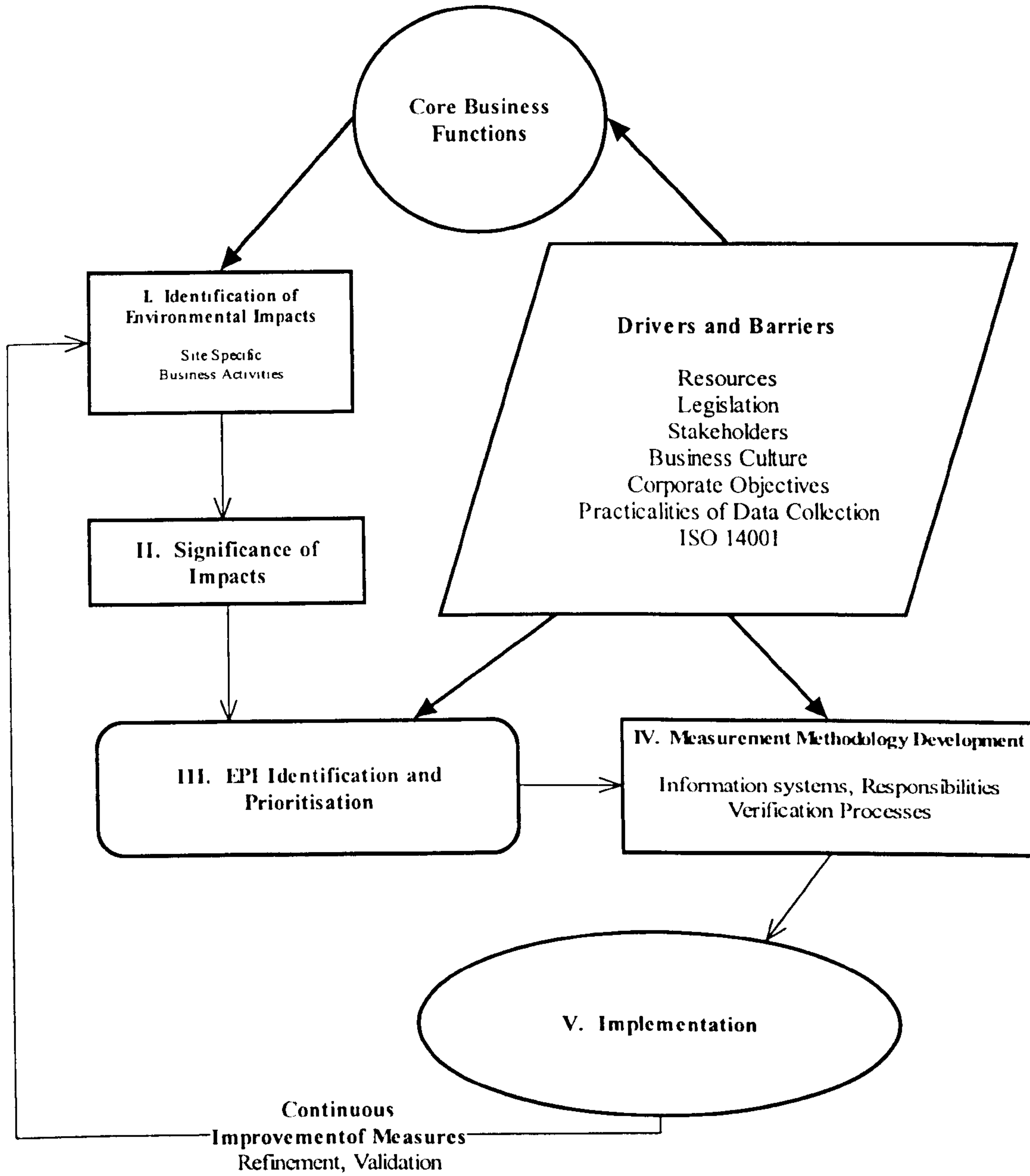
Key to Drivers:

- | | | | |
|----|-----------------------------------|------|----------------------------|
| R: | Corporate Environmental Reporting | L: | Legal Requirements |
| C: | Cost Reduction | I: | Specific to ISO 14001 |
| S: | Standards (actual or de facto) | Sk: | Stakeholders |
| B: | Best Practice | (): | Indicates secondary driver |

A good example of stakeholder pressure and the driver for best practice is that one of ICL's customers, Post Office Counters Limited, recently requested from ICL a statement concerning ICL's reaction to and readiness to comply with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). ICL was able to respond on the basis of not only its activities on many industry groups in lobbying the EU on the Directive, but also on the basis of the EPIs put in place, particularly over the last five years concerning the methods for collection, take-back, disassembly and recycling of end-of-life IT equipment. As can be seen in Table 1 these EPIs include both operational and management performance indicators. In essence ICL has set up a stringent environmental auditing programme of their recycling partners which includes a set of performance criteria against which ICL's own internal take-back and recycling operations are also scored. They have set up a certification scheme for recyclers who are appointed ICL Approved Recyclers or ICL Approved Remanufacturers together with a programme of continuous improvement and re-auditing of recycling partners.

Once EPIs had been identified and agreed within ICL, a standard method for their measurement is determined and communicated across the organisation. This often involves the use of information systems to collate all the information but has to be assessed manually and recirculated back to the origin to gain validation of the data. The overall process used at ICL is outlined in figure 2 and highlights the drivers and barriers involved in such a process. The process can be seen to be a generic one and may well be applicable to any industry. The drivers and barriers may be so intense that they may cause changes to the core business functions of an organisation which in turn would lead to a re-identification of environmental impacts and a new cycle of EPI identification and measurement systems implementation. One example of these effects might be the introduction of a levy on company parking spaces leading to a move towards hot-desking and home working. Another example might be the introduction of a lead ban whereby electronic and electrical goods producers would have to ensure that engineers were not using Pb solder and that no components contained Pb etc.

Figure 2: Approach to EPE Development



Key:

Process Flow →
Pressures ==>

Conclusion

The more varied the environmental performance indicators an organisation develops, especially those that relate to best practice, cost reduction and stakeholder interests, the more opportunity it has to demonstrate itself to be a leading edge company that is both attractive to its stakeholders and has strengthened its competitive edge. In order to develop varied and feasible indicators a whole host of different barriers and drivers need to be addressed and integrated into the decision-making processes. The management of change is becoming an important issue for many businesses in today's economic climate and one that environmental managers need to address. In the case whereby the drivers or barriers identified have a large impact on an organisation to the extent where changes to core business functions need to be made, the EPI decision-making process has to be revisited. The example of ICL plc. has shown that where a company does not manufacture, but is the provider of services, supply chain issues have to be addressed closely in the development of EPIs for the purposes of developing any environmental management system, and ISO 14001 certification, and ensuring legal compliance. Further research is needed and it is intended that it should include defining a methodology for embedding EPIs within an ISO 14001 implementation process and to assess the comparability of indicators across the IT sector and service orientated organisations like ICL plc.

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Annex 2

**Annex 2:
Drafts of Generic Environmental Management System Documentation for
ICL plc, Incorporating Provision for Environmental Performance Indicators**

**Appendix 1:
Plan for the Development of the ICL Group Environmental Management
System**

**Appendix 2:
ICL Group Environmental Management Manual**

**Appendix 3:
Environmental Legislation Notification**

**Appendix 4:
Register of Environmental Legislation**

**Appendix 5:
ISO 14001 – Environmental Information for Bids**

No	Action	Responsibility	Date
1.0	Formation of ICL's Corporate EMS Documentation and Information System		
1.1	Environmental Manual and Schematic	Gail Collins	Sep '99
1.2	ISO Implementation Plan	Gail Collins	Sep.'99
1.3	Environmental Input for Bids	Gail Collins	Sep.'99
1.4	Environmental Legislation Notification Procedures	Gail Collins	Sep. '99
1.5	Environmental Legislation Register	Gail Collins	Sep.'99
1.6	Environmental Performance Measurement Procedures	Gail Collins	Dec. '99
1.7	Environmental Performance Indicators Manual	Gail Collins	Dec. '99
1.8	Set up of EPI Database and Electronic Reporting Forms	Gail Collins	Dec '99
1.8	Set up of EMS Non-compliance and Corrective Action Database	Gail Collins	Dec. '99
2.0	Formation of ICL Business EMS Documentation and Implementation		
2.1	Identify Environmental aspects/effects and applicable legislation		
2.2	Specify source/route and process for legislation update		
2.3	Determine sections of ICL Policy applicable to business activities		
2.4	Identify specific environmental performance measures applicable to business activities for reporting in to CEA electronically		
2.5	Produce programme of activity to achieve targets		
2.6	Define the management structure and responsibilities		
2.7	Determine how the policy and environmental messages/ achievements are to be communicated to staff, customers, neighbours etc.		

No	Action	Responsibility	Complete date
2.8	Produce Procedures: 1. Management Review – (Business Division HQ Procedure) 2. Programme Review (Environmental Manual) 3. Legislation Awareness - (Env Manual) 4. Training -(Env Manual) 5. Communication - (Env Manual) 6. Documentation Control –(Business Division HQ Procedure) 7. Emergency Preparedness and Response - (Site Fac Manual) 8. Monitoring and Measurement - (Business Division HQ Procedure and Site Fac Manual) 9. Non conformance and Corrective action - (Business Division HQ Procedures and Site Fac Manual) 10. Records - (Site Fac Manual/Business Division HQ Procedures) 11. EMS Audits - (Business Division HQ Procedures)	Division EMS Imple. Div Imp/ Site Fac Mgr Div Imp/ Site Fac Mgr Div Imp/ CEA team Div Imp/ CEA team Div Imp/ Site Fac Mgr Site Fac Mgr Div Representative/ Site Fac Team Div Rep./ Site Fac Team Div Rep/ Site Fac Mgr Div EMS Imp	
3.0	Registration Overall Completion Date:		
3.1	Identify Registration Body and register application.	J.Boyce/ Division EMS Implementor	
3.2	Optional Registration Body pre-visit.	Division EMS Imp./ Site Fac Manager	
3.3	Internal Audit	Division EMS Imp./ J.Boyce	
3.4	Corrective Actions	Division EMS Rep./ Site Fac. Mgr	
3.5	Registration Body audit		
3.6	Certificate received and displayed		

1. DOCUMENT CONTROL

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1.2 REFERENCED DOCUMENTS

The list below identifies documents referenced within the text or associated with this document. The reference number is shown in the text thus: [n] where n = the reference number.

Ref no.	Document reference	Document Title
[1]	EN ISO 14001	Environmental management systems - Specification with guidance for use
[2]		Environmental Performance Indicators Manual
[3]		Divisional Environmental Management Programme
[4]		Disaster Recovery Plan
[5]		List of Records Held by Site Facilities Management
[6]		Divisional Procedure for Record Retention
[7]		Divisional Review and Audit Procedure
[8]		Environmental Performance Measurement Procedures

2. INTRODUCTION

In order for Divisional sites to be conformant with ISO 14001 they should be assessed for the environmental impacts associated with the site locations, and the products and processes associated with the particular business activities. The inter-relationships between these areas should also be identified. As ICL site facilities are subcontracted to and managed by Workplace Management Ltd, they are integral to the implementation of ICL's EMS. All ICL buildings are supplied with:

- Energy in the forms oil, gas and electricity for lighting ,IT, air conditioning , the restaurant/ kitchen, and heating,
- Energy in the form of fuel for employee travel
- Water for washrooms, the restaurant and coffee machines

Staff will need to work closely with the Facilities Management Teams in order to constantly improve the levels of recycling , and energy and water conservation ICL sites are often multi-tenanted and the details of this should be noted for the purpose of measuring the overall environmental performance of the sites.

The main ICL sites to be prioritised are those that contain the warehouse operations and are concerned with the re-configuration of products and there distribution. These sites, along with the larger office sites and those sites that have concentrations of staff that do large amounts of mileage, have the largest environmental impacts. All ICL sites handle and produce:

- Packaging arising from the supply of paper or products
- IT equipment arising from domestic use or from ICL customers.

Staff will need to work to minimise the consumption of these materials and the production of related-waste arising from these materials. It will be necessary to measure the amounts of such wastes produced and to maintain audit trails of the wastes in line with the Corporate Environmental Policy. With regard to packaging this means that all packaging waste produced should be recorded along with details of any packaging that is reused and evidence obtained for any recycling carried out, by material type. For waste IT, the procedures for the handling of waste IT equipment should be followed (ref:).

Some of the main ICL sites consume:

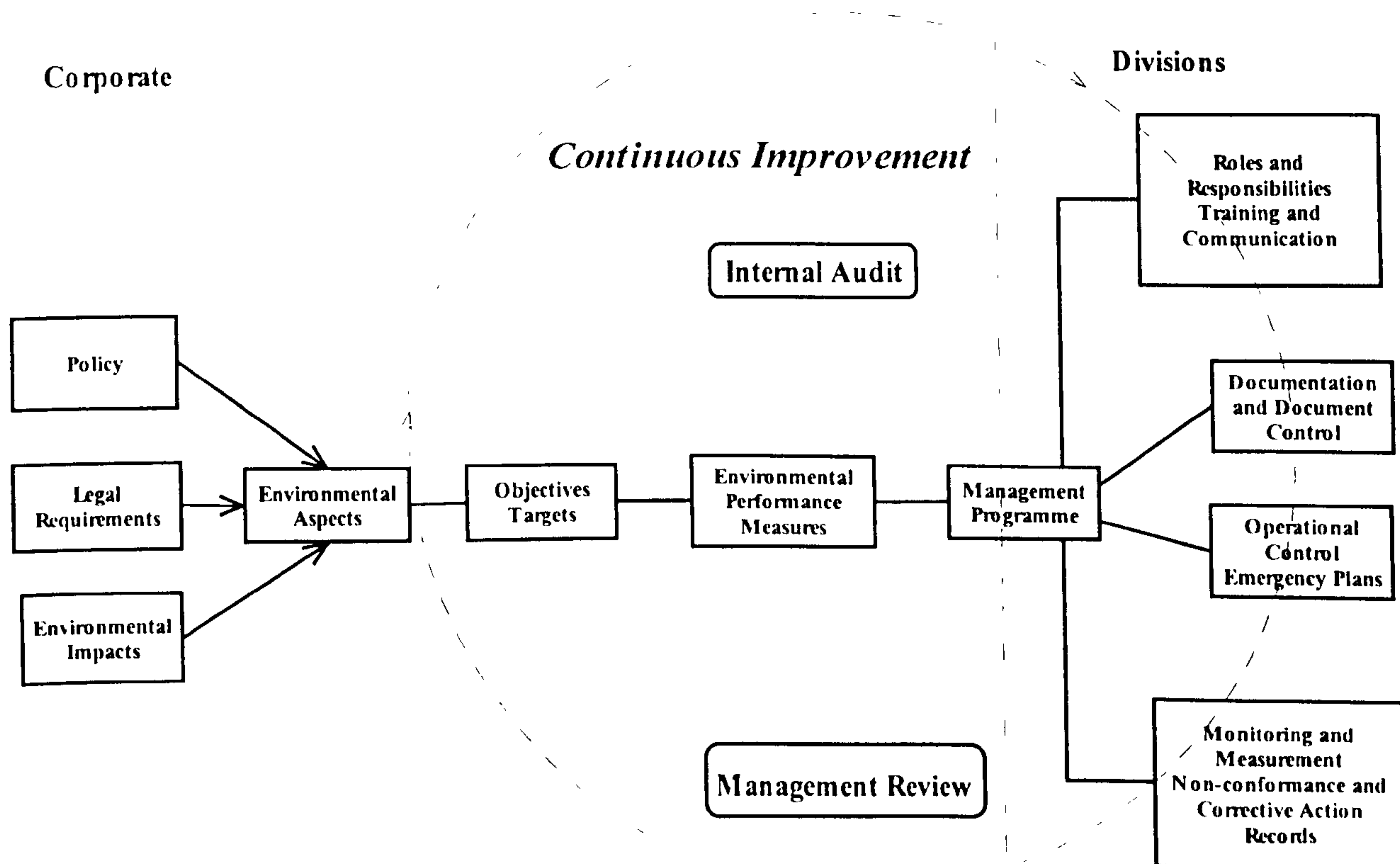
- Energy in the form of fuel for product distribution and the ICL fleet.
- Energy for running machinery in the warehouse operations

3. ENVIRONMENTAL MANAGEMENT SYSTEM

3.1 GENERAL REQUIREMENTS

The Environmental Management System described in this section has been established by Corporate Environmental Affairs and outlines how the ICL Group conforms to the requirements of ISO14001. The diagram below shows the overall system:

ICL's Environmental Management System ISO 14001



3.2 ENVIRONMENTAL POLICY

ICL Corporate Environmental Policy and Targets are shown in Appendix A.

Some sections of the policy will not be relevant to all ICL sites as described in the previous section and it will be necessary for Business Divisions to decide which environmental impacts apply to their business operations and specific sites.

The targets should be designated according to the capabilities of the business division and its sites and should, therefore, be as close as possible to the Corporate Environmental Targets whilst still being realistic and achievable.

3.3 PLANNING

3.3.1 Environmental aspects

The Environmental Aspects of the ICL Group have been identified via environmental reviews and audits performed by Corporate Environmental Affairs of various ICL sites and operations. The environmental impacts of the ICL Group have been translated into performance indicators that can be measured [2]. It is the responsibility of individual ICL Divisions to identify via the environmental review and audit process which of the identified environmental aspects apply to their business operations and sites and any additional environmental impacts that apply to their specific operations.

Environmental aspects of ICL Divisional activities, products and services at any ICL sites are reviewed via regular environmental audits and an annual Management Review. Any necessary changes to the priority, objectives and targets for the identified aspects are made accordingly. The environmental aspects and associated environmental impacts for this ICL Division are laid out in the table below:

N o	Environmental Aspects	Environmental Impact	Environmental Performance Indicator
1			
2			
3			
4			
5			
6			

3.3.2 Legal and other requirements

Changes to legislation which affect ICL are communicated to the Business Division EMS Representative and the Site Facilities Manager directly from the Corporate Environmental Affairs department at ICL Wsr01. The Corporate Environmental Affairs Dept. maintains a standard distribution list to which changes in legislation are communicated. The Corporate Environmental Affairs Department are responsible for keeping fully up to date with changes in legislation and for communicating this throughout ICL.

The individual ICL Business Divisions are responsible for identifying which environmental legislation is relevant to their particular business activities and sites and for identifying any additional environmental regulation that may apply to them due to Local Authority control. The table below identifies the environmental legislation relevant to this ICL Division:

No	Environmental Aspects	Relevant Legislation
1		
2		
3		
4		
5		
6		

3.3.3 Objectives and targets

The ICL Group has met or exceeded all targets set for the relevant sections of the ICL 1994/97 Corporate Environmental Policy. The ICL Division Targets and Site Specific Targets are laid out below:

No	ICL Division Environmental Target	Site Specific Target
1		
2		
3		
4		
5		
6		

3.3.4 Environmental Management Programme

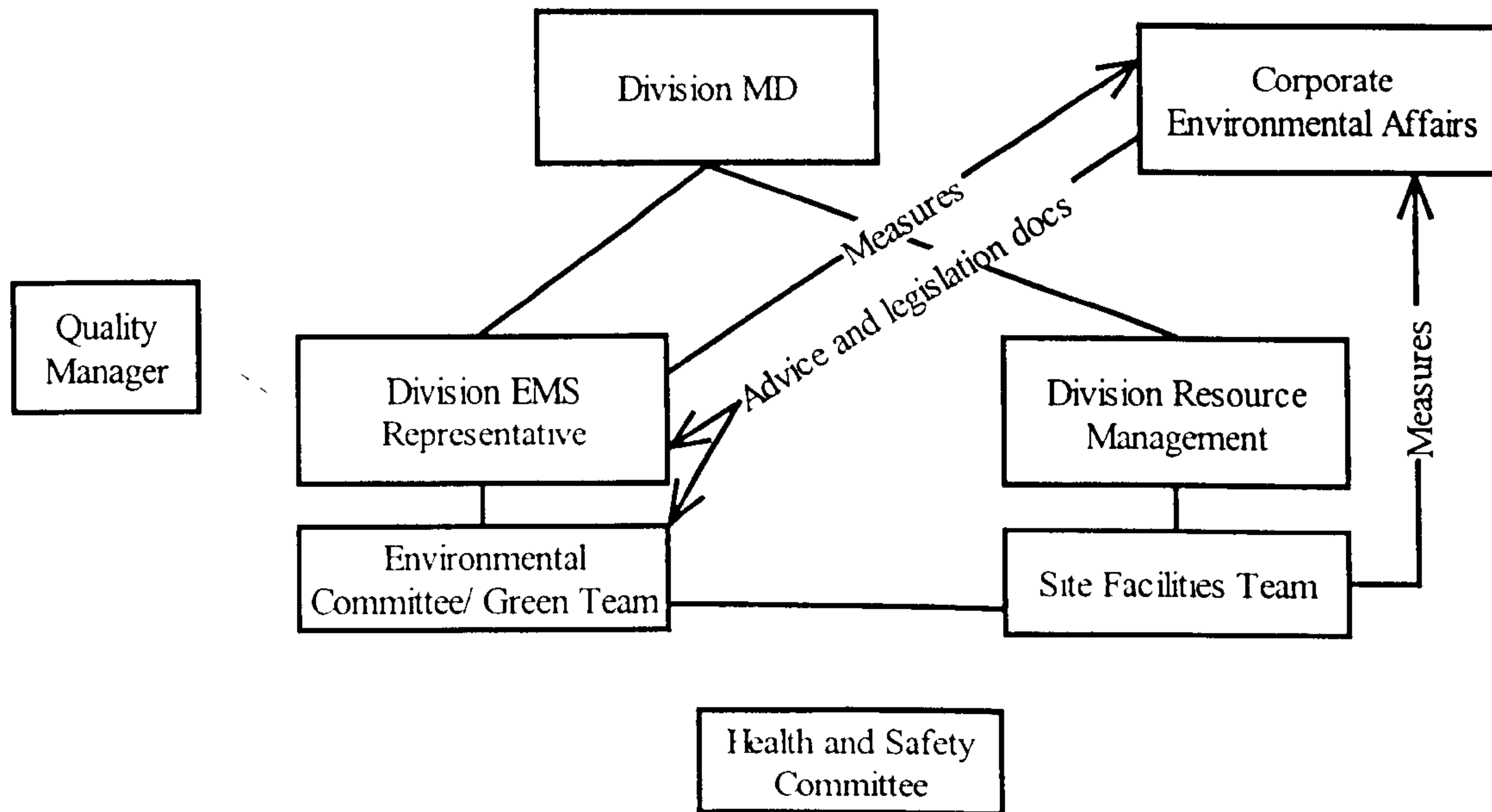
An Environmental Management Programme, Ref [2], is maintained by the Site Facilities Function at the main ICL Division site. The responsibility for maintaining and regularly reviewing progress against the programme rests with the Divisional EMS Representative and the Site Facilities Manager.

The programme specifies :

- The target to be achieved
- The date by which the target is to be achieved
- The method of measurement
- The individual responsible for taking and reporting the measurement to CEA
- Dates for Environmental review for any new activities

3.4 IMPLEMENTATION AND OPERATION

3.4.1 Structure and responsibility



Guideline Organisational Chart for Divisional Responsibility

The above diagram shows guidelines for the management organisation for the Divisional Environmental Management System.

The Division EMS Representative is the management representative with responsibility for:

- Ensuring that Environmental Management System requirements are established, implemented and maintained in accordance with ISO14001
- Reporting on the performance of the Environmental Management System to top management for review and as a basis for improvement of the Environmental Management System
- Reporting measures on environmental performance to CEA

The Site Facilities Management is responsible for:

- Reporting on the environmental performance of the divisional sites to the Environmental Committee
- Reporting of measures to CEA.

Health and Safety committees are involved in any common issues.

The Environmental Committee and/ or Green Teams are responsible for:

- Monitoring recycling resource conservation in their work areas and encouraging improvement among their colleagues
- Assisting with the communication of environmental messages and raising environmental awareness e.g. supporting Green Days held by CEA at ICL sites
- Assisting with decisions on future policy and direction for environmental improvements
- Driving environmental improvements throughout business activities

The Environmental Management System Representative is a trained environmental auditor and is responsible for performing Environmental Management System Audits against an annual audit schedule and for following up the resolution any identified corrective actions, with the Environmental Committee and the Site Facilities Manager. The EMS Representative will also provide advice and guidance with the support of CEA.

The EMS Representative and the Site Facilities Function are required to report Quarterly to the ICL Corporate Environmental Affairs Group. The required information includes energy savings, recycling quantities of Divisional Sites and Environmental Performance Indicators that relate to all business activities.

The ICL Corporate Environmental Affairs Group also provides professional expert advice and guidance and also keep the EMS Representative and the Environmental Committee apprised of environmental legislative change.

3.4.2 Training awareness and competence

Staff Training

All site service staff receive the training necessary to fulfil their responsibilities for the Environmental Management System. Ongoing training needs are identified as part of annual appraisals. Training is also provided when a process or the equipment in use is changed. The EMS Representative is trained to the level of Advanced Environmental Auditor by an EARA Approved Training Consultancy and is provided with any additional training necessary to fulfil their function. The EMS representative is responsible for ensuring that the Environmental Committee receives any environmental training necessary for them to carry out their roles. The Site Services Manager is responsible for ensuring the site services staff receive training for the work they are required to do and achieve a level of competence appropriate. Training may be via organised courses or via supervised on the job experience. Training on environmental issues is provided for all ICL staff via an interactive website on the ICL Cafevik Intranet.

Contract staff working on site

A number of contract staff are employed for specific tasks at ICL sites. Such contract staff are provided with a written statement of the ICL site's requirements placed upon them when they arrive on site for the first time. This includes requirements for Safety, Security and the Environment. The contractors will sign a copy of the instruction sheet to confirm that they have read and understood the requirements and will comply with them. The signed sheets will be held as records within Site Services.

Awareness

It is recognised that all staff based at, or visiting, ICL sites need to be aware of the Environmental Management System and in particular the recycling and energy saving programmes. It is the objective of the Environmental Programme to involve all staff.

Awareness is maintained via:

- Communication and action from the Site Environmental Committee and/or Green Teams
- Posters
- Messages broadcast via electronic mail
- Environmental audits
- Green Days
- The ICL Induction programme

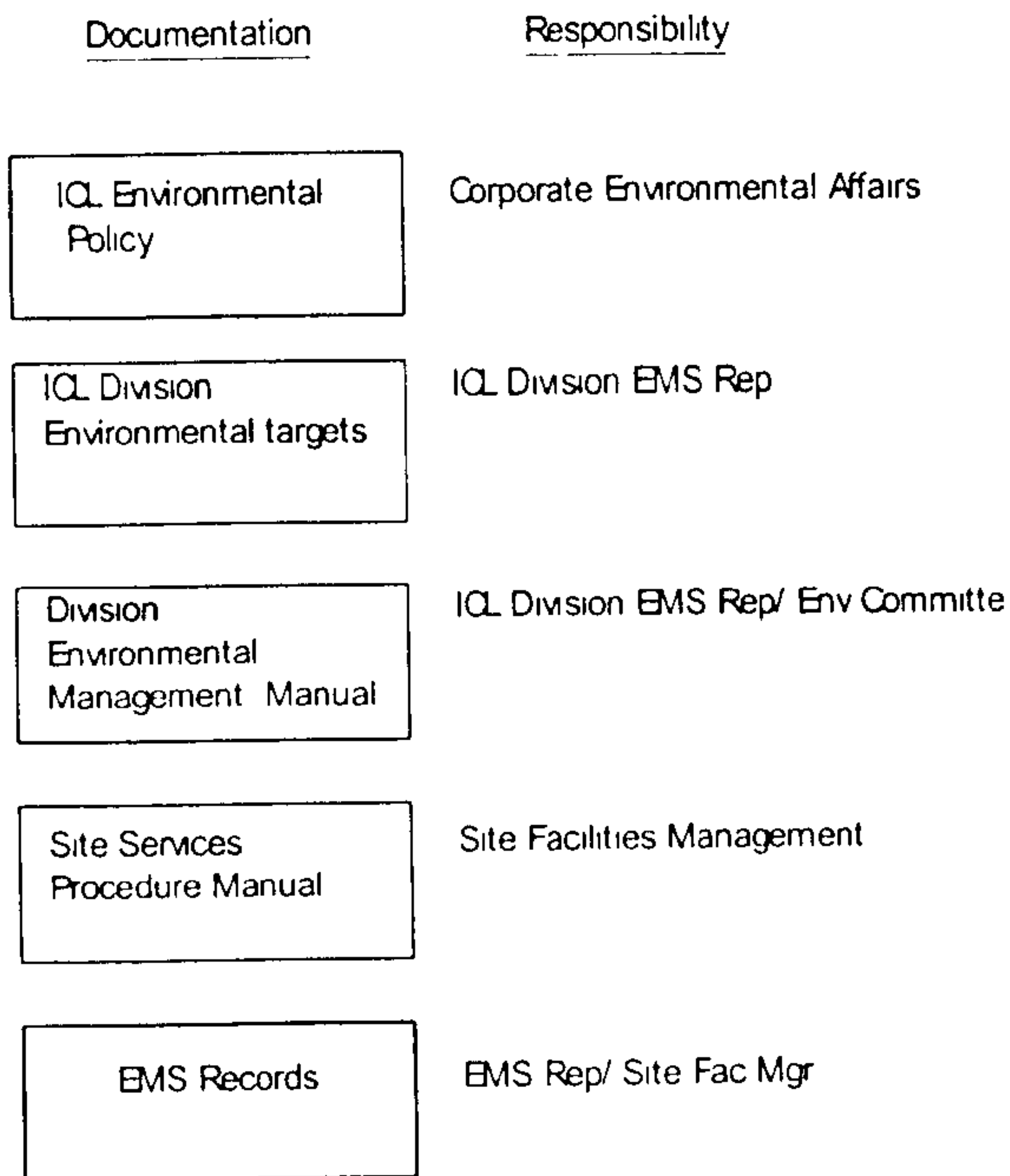
3.4.3 Communication

The Site Services Manager maintains contact with the Local Authority to ensure that routes to and from the authority are open to receive any complaints or issues raised regarding ICL sites and their environment and for ICL Divisions to respond. Contact is normally by letter.

Communication related to the EMS from any source external to ICL is logged by the Site Facilities Function and an acknowledgement response is sent if necessary. The Site Facilities Manager decides if any action is necessary and organises for such action to be taken. A formal response to the communication is then sent. Records of all such communication are retained.

3.4.4 Environmental Management System documentation

The structure of the Environmental Management Documentation is shown in the diagram below:



EMS Documentation Structure

3.4.5 Documentation control

The required methods for documentation control are defined within ICL Divisional HQ Documentation Standard Procedure (Ref:).

3.4.6 Operational control

The following operations and the procedures which describe them are associated with the environmental aspects identified in section 3.3.1:

Operation	Procedure Reference

3.4.7 Emergency Preparedness and response

The ICL disaster recovery processes for the SLH06 site are included within the Disaster Recovery Plan ref. [3].

3.5 CHECKING AND CORRECTIVE ACTION

3.5.1 Monitoring and Measurement

No monitoring equipment requiring calibration is used for measuring or monitoring processes which have an environmental impact.

The procedures describing the monitoring and measurement of environmental aspects against targets have been defined by Corporate Environmental Affairs in document Ref: [7]. Those environmental performance indicators that apply to this ICL Division are defined below:

EPI	Units of Measure

3.5.2 Nonconformance and corrective and preventive action

All nonconformances identified are entered onto the Environmental Management Database. This will identify the nonconformance, the responsibility for resolution, the action taken to resolve, the target timescales for resolution and any procedures changed as a result of corrective action taken

Nonconformances may be identified through :

- Environmental Audits
- Issues raised by the members of the Environmental Committee
- Issues raised externally to ICL by the local authority or other source
- Issues raised from any other source which are agreed to be nonconformances by the EMS Representative and Site Facilities Manager

Preventive actions identified through any route but primarily via audit or management review are handled similarly to corrective actions and are entered upon the same database but clearly identified as preventive action.

3.5.3 Records

Records held as part of the Environmental Management System are listed in document ref. [4]. The list is controlled within the Division EMS Representative office and the Site Facilities Management Function.

Records are retained in compliance with the requirements of ICL Procedure for Record Retention ref. [5]

3.5.4 Environmental management system audit

The procedure for EMS audits is defined within procedure ref. [6].

3.5.5 Management review

The procedure for EMS Management Review is defined within procedure ref. [6]

Appendix A ICL Corporate Environmental Policy and Targets

Policy

ICL is dedicated to the protection of all components of the environment which might be affected by its activities and to the compliance with, and anticipation of, environmental legislation.

ICL Board members are committed to ensuring that our environmental policy is understood and implemented at every level of the organisation. ICL is committed to training and informing its staff on environmental matters. Our people are empowered to take individual actions to reduce the company's impact on the environment.

ICL will have measurable targets against which we can monitor our environmental performance. We will communicate throughout the ICL group of companies and externally our performance against the targets.

ICL will continue to work to minimise the effects of its operations and products on the environment through a process of continual improvement in our design, manufacturing and end of product life processes, and will also adhere to environmental standards and legislation. We will remember the impact of our products on people - our products will exceed ergonomic standards.

ICL will introduce programmes for the recycling of products and waste, and is committed to reducing energy consumption in its products and operations.

ICL works with its suppliers to ensure that they in turn give thought and consideration to the impact of their processes and products on the environment. We also work closely with our customers to identify ways in which together we can improve awareness of, and impact on, the environment.

In particular we will monitor all parts of our business against these specific goals:

- Design our products with a view to their eventual disassembly and their energy consumption, emission levels and ergonomic efficiency
- Aim to minimise the use of all materials, supplies and energy in our manufacturing operations, and, wherever possible, use renewable or recyclable materials and components and reduce levels of, or eliminate, any harmful emissions
- Promote the use of recycled materials where possible throughout our operations, initiate recycling programmes, and encourage re-use and refurbishment
- Minimise waste produced in all parts of the business and aim for continual waste reduction
- Expect similar environmental standards to our own from all third parties involved with our business - suppliers, vendors and contractors
- Assess on a continuous basis the environmental impact of our operations, and adopt an environmentally sound transport and logistics strategy
- Establish a comprehensive energy efficiency programme with a rigorous on-going plan for the reduction of energy consumption
- Support a comprehensive self-auditing environmental process throughout the organisation with our own targets and national, European and international standards as its benchmarks
- Encourage our staff in environmental initiatives and support them with training and awareness programmes on environmental issues

- Assist in developing solutions to environmental problems and support the development of public policy and national, European and international legislation

1994/97 Targets-Life cycle of product

Design

ICL has already begun to design its products for disassembly, for low energy consumption, in the use of recycled plastics, and in using materials and components which are environmentally conscious. Its efforts in this area are most advanced in its PC and mainframe computer product ranges. In 1994/97. ICL will extend its efforts for environmentally credible design to all of its products.

1994/97 targets

ICL will continue to design its products for disassembly. New products will be designed to include maximum use of clip-on parts, standardisation of screws and the marking of plastics.

ICL will, where practicable, maximise the use of recycled plastics in new PC, terminal and midrange products which are in the design stage in 1994/97. In addition, ICL will look at increasing the use of recycled plastics in its specialist products for the retail and financial services markets.

ICL will, where practicable, design new products to include lithium batteries, condensers free from cadmium and poly-chloro-biphenols and will not use flame retardants nor sprayed EMI-shield coating on plastic housing.

ICL has already incorporated software which reduces energy consumption during operation in its latest range of PCs and has a mainframe range of computers with one of the lowest energy needs. It will seek to extend low energy consumption throughout its products.

1994/97 Targets

ICL will, where possible, seek to design new products with increased processing power with the same or lower energy consumption, where this is applicable.

Distribution and Packaging

ICL's packaging materials and methods already meet the minimum required standards in all the countries in which it operates.

1994/97 Targets

In 1994/97 ICL will, where practicable, offer to remove all hardware packaging on delivery, and, where condition of the material permits, will recycle and reuse it.

At present a significant percentage of ICL packaging is manufactured from recycled materials. During 1994/97 ICL will seek to increase this proportion by 5%. ICL will continue to design its packaging for disassembly, thus ensuring more effective recycling and reuse of packaging.

In many of its operations, ICL products are received, stored and distributed on reusable pallets. In 1994/97, ICL will seek to increase its use of reusable pallets by 5%.

ICL already distributes a large proportion of its software and documentation electronically or in bulk on CD-ROM. In 1994/97 ICL will aim to increase the amount of software and documentation distributed in this way by 50%, making a significant saving in paper, printing, and transport.

End-of-Life

ICL has recycling centres throughout Europe including Denmark, France, Sweden, the Netherlands, Finland and UK where, at its Byley, Cheshire centre it refurbishes and recycles equipment from the UK and provides product for ICL's World-wide Spares operation.

1994/97 Targets

Where legal requirements exist, ICL will take back end-of-life equipment for recycling, reuse or refurbishing. Where such requirements do not exist, ICL will offer to take back end-of-life equipment for recycling, reuse or refurbishing.

During 1994/97 ICL will seek to decrease by 1% overall of the total returns the amount of equipment which is committed to landfill by improving its recycling and refurbishing process at Byley. This is dependent upon a similar mix of equipment being returned to Byley.

During 1994/97, ICL will work with its operating companies to obtain statistical information on the amount of used equipment which is recycled in its European operating companies.

ICL will ensure that all recycling organisations with whom it works follow best practice. During 1994/97 we will plan to audit them on an on-going basis and will begin the auditing process.

ICL will ensure that the end-of-life equipment returned to its operating companies will be inspected and refurbished and used for spares.

1994/97 Targets - Accreditation and Auditing

ICL has pioneered a policy of conformance to standards in the IT industry, both technological standards like open systems, and business standards such as ISO9000. ICL will extend this policy to the management and continuous improvement of environmental issues.

1994/97 Targets

ICL will seek accreditation for the appropriate national, European and international environmental management standards. ICL will implement a programme of internal environmental audits at three key UK sites during 1994/97. The process of preparing for internal auditing will also begin at selected European sites. In addition external auditing will be carried out at two key UK manufacturing sites during 1994/97

1994/97 Targets - ICL's Suppliers

ICL has an accredited vendor scheme which has been in operation for some years. In the past ICL has encouraged and supported its vendors during their registration for BS5750, the Total Quality Management standard.

1994/97 Target

ICL will expect its accredited vendors to apply or be planning to apply for the appropriate environmental standards and consideration will be given to this in every purchase made by the company. We will continue the dialogue with our suppliers concerning their own environmental policies.

1994/97 Targets - Energy efficiency

ICL is a signatory of the Energy Efficiency Office's Declaration of Commitment which commits the company to responsible energy management. ICL has energy management systems in operation at many sites throughout the UK.

1994/97 Targets

ICL will put in place all of the actions required by the Energy Efficiency Office's Declaration of Commitment.

ICL will aim to reduce its energy consumption in offices by 3% during 1994/97.

1994/97 Targets - Transport and Communications

ICL already has a logistics policy which involves using the most environmentally conscious methods of moving product around the world. Its car fleet policy includes the mandatory use of unleaded petrol for all company cars and encourages the use of catalytic converters, diesel fuels and liquefied petroleum gas (LPG) engines.

ICL has long experience of using technology to help safeguard the environment. Since 1984, ICL has been building its own internal electronic mail network, thus reducing consumption of paper and energy for transportation. Today it

operates one of the world's largest X.400 networks providing a range of services to support the company's business communications needs.

ICL estimates that its video conferencing network saves the company more than one million passenger kilometres per year. The network comprises some 20 plus video conferencing studios in the UK, mainland Europe, North America and Japan. ICL has also pioneered the use of telecommuting to reduce the amount of employee miles travelled each year.

1994/97 Targets

During 1994/97 ICL will increase the number of vehicles in its world wide fleet which are fitted with catalytic converters, and will also increase the number of diesel vehicles in the fleet.

During 1994/97 ICL will seek to increase its use of video conferencing facilities by 20%.

1994/97 Targets - Elimination of waste

ICL has already put in place waste elimination systems at many of its manufacturing plants and is monitoring waste at these plants and at its administration sites. It plans to extend both the formal systems and the monitoring activities.

1994/97 Targets

During 1994/97 ICL aims to reduce its use of virgin paper by 2%, and will encourage the increased use of recycled paper.

ICL's manufacturing operations in the UK and Europe will seek to reduce their water consumption by 5% during 1994/97

1994/97 Targets - Recycling of consumables

In many ICL sites throughout the world, with the support and co-operation of management, ICL staff have set up their own recycling schemes for used paper, cardboard, bottles, plastic cups aluminium cans, batteries and office equipment consumables. Many sites have won local environmental awards and have also taken action to prevent the local natural environment. In formally monitoring these activities, ICL will also seek to encourage staff initiatives and enthusiasm for environmental protection.

1994/97 Targets

In 1994/97 ICL will aim to increase the amount of virgin paper and cardboard it recycles by 2%.

Most ICL sites throughout Europe now have plastic cup recycling schemes in place. IN 1994/97 ICL will aim to recycle 30% of all plastic cups used in the UK and mainland Europe.

A formal process for recycling laser printer consumables has been in operation in the UK and Europe for some time. In 1994/97 ICL will seek to increase the number of laser printer units recycled by 5% and will also make this scheme available to its customers in the UK..

1994/97 Targets - Training and awareness

ICL has an excellent record for training both its own staff and its customers and holds a UK Government "Investing in People Award". ICL's training activities will be extended to include environmental management and awareness.

1994/97 Targets

Early in 1994 we formally launched our Corporate Environmental Policy to our staff, our suppliers and our customers. During 1994/97 ICL aims to extend its environmental staff training programme to reach all staff throughout Europe and will also introduce staff environmental action awards.

IN 1994/97 we will also introduce a supplier awareness pack which will aim to support suppliers who are registering for the appropriate environmental management standards, and we will also offer practical advice and guidance to suppliers.

In 1994/97 ICL will support schemes to promote staff community action for the environment and will also encourage individual initiatives

Annex 2 Appendix 3

TITLE: Environmental Legislation Notification

AUTHOR: Gail Collins

DOCUMENT STATUS: Draft

SUMMARY: This document defines the procedure for the identification and dissemination of information on environmental legislation that is relevant to ICL business

AUTHORISED BY:

Head of Corporate Environmental Affairs Joy Boyce Signature Date.

Process Owner: Joy Boyce,

Distribution:

Issue	Date	Reason for change
1		Draft

DOCUMENT CONTROL

3.6 Contents

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3.7 Changes from previous issue

This is the second draft issue of the document

3.8 Referenced documents

The following documents are referred to in the text thus, [n], or are associated with this document.

[1] The Register of Environmental Regulations

3.9 Change Control

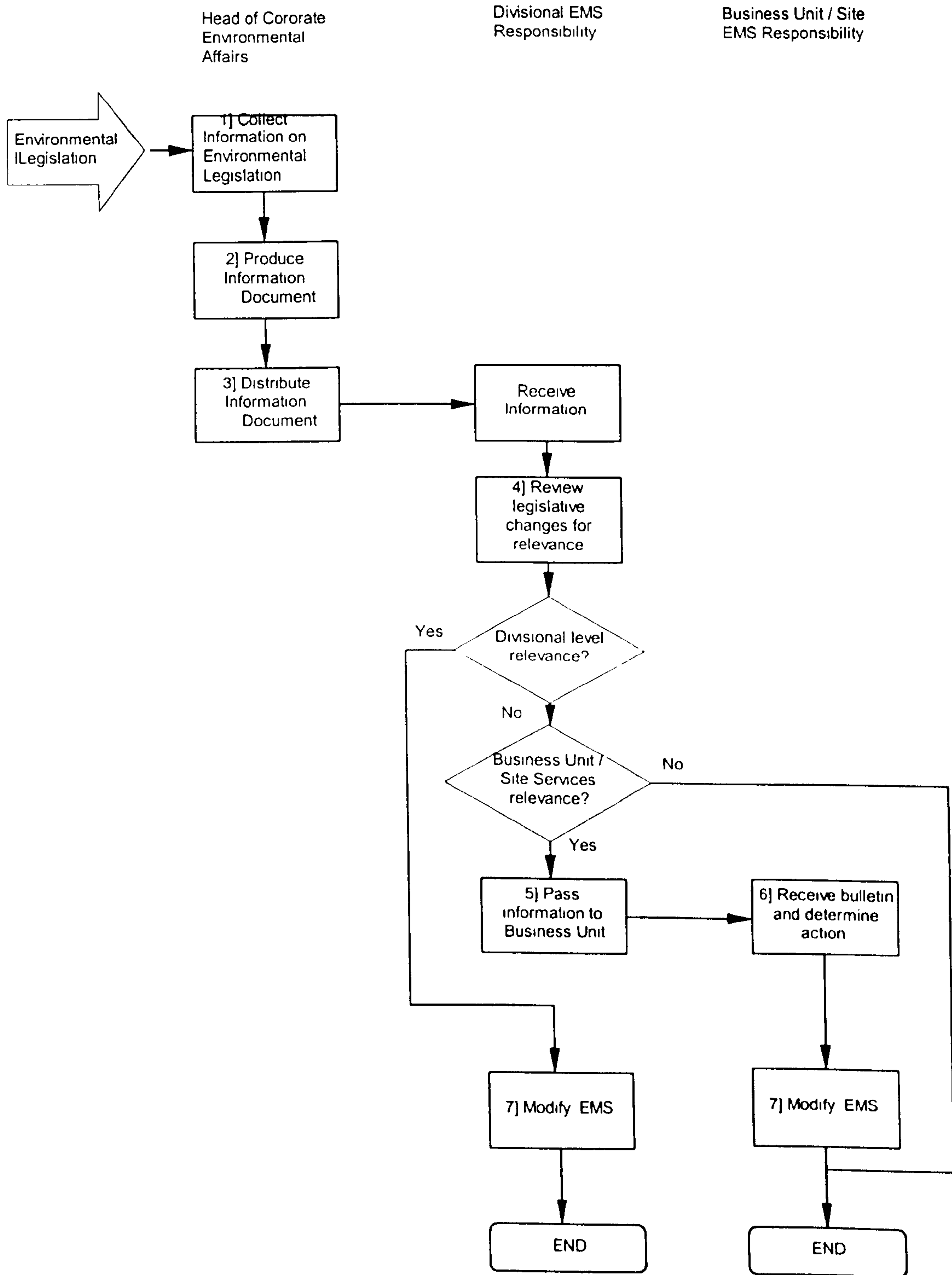
This document is subject to the change control process applicable to Procedures.

INTRODUCTION

ISO14001 requires that the management system ensures the identification and swift implementation of any necessary changes required by environmental legislation. This procedure describes the identification and dissemination process for informing ICL businesses of any legislative changes. In order to satisfy the ISO 14001 requirement that companies have access to all the applicable legislation, a Register of Regulations has been compiled ^[1].

It is the responsibility of the ICL Business Divisions and Site Facilities Management to keep informed of local variances in the implementation of legislation

FLOWCHART



PROCESS DESCRIPTION

Ref	Explanation	Records	Work Instruction
1	Corporate Environmental Affairs regularly scans sources as appendix A for legislative change likely to impact ICL		
2	Corporate Environmental Affairs create environmental legislation information document	Document	Document Creation
3	Environmental Affairs distributes bulletin to specified distribution list via appropriate media.	Distribution record	Distribution list
4	Business Division reviews legislative bulletin to determine action necessary. Contacting Corporate Environmental Affairs for guidance as necessary.		
5	The Business Division may opt to either filter the legislation and forward only that considered necessary to all relevant business units or distribute to all designated recipients within the Division		
6	Business Units receive bulletin and determine any necessary action, taking advice from local expertise or from Corporate Environmental Affairs		
7	Update if necessary the relevant documentation and take action as prescribed within the local Environmental Management System	Change controls for EMS	

APPENDIX A: Sources of Information on Environmental legislation

Legislative Update Documentation:

Croners

Environmental Management Case Law

Waste Management

Environmental Management

European Directives

Draft Directives: Electronics End-of-Life

Batteries

Agra Europe

European Packaging and Waste Law

Perchards

Packaging Legislation in Europe

Producer Responsibility for End-of-Life Products in Europe

UK Government Environmental Legislation Publications

Consultation Papers

Draft Regulations

Annex 2 Appendix 4

TITLE: Register of Environmental Legislation

AUTHOR: Gail Collins

DOCUMENT STATUS: Draft

SUMMARY: This document defines the procedure for the identification and dissemination of information on environmental legislation that is relevant to ICL business

AUTHORISED BY:

Head of Corporate Environmental Affairs Joy Boyce Signature Date

Process Owner: Joy Boyce

Distribution:

Issue	Date	Reason for change
1		Draft

Scope

This document lists the regulatory framework in which the ICL Group is constrained to operate.

List of Statutes and Regulations

The Control of Pollution Act 1974

The Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations 1984

The Environmental Protection Act 1990

- Part II: Waste on Land

- Part IIA

Environmental Protection (Duty of Care) Regulations 1991

Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991.

The Controlled Waste Regulations 1992, 1993

Waste Management Licensing Regulations 1994

Environment Act 1995

- UK Waste Strategy

Special Waste Regulations 1996

UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997

The Packaging (Essential Requirements) Regulations 1998

The Landfill Tax

3.9.1 Other

Town and Country Planning Regulations

Noise at Work Regulations of 1989

Energy Legislation

- Buildings Regulations 1991

- Electricity at Work Regulations 1989

Health and Safety at Work Act (HASXA) 1974

The Environmental Protection Act 1990

- Part IIA: Contaminated land

- Part III: Statutory Nuisance

Batteries and Accumulators (Containing Dangerous Substances) Regulations 1994

3.9.2 European Directives

75/442/EEC: Directive on waste (amended by 91/156)

84/631/EEC: Directive on the trans-frontier shipment of hazardous waste

94/62/EC: Directive on packaging and packaging waste

91/157/EEC: Directive on Batteries and Accumulators containing certain dangerous substances.

93/86/EEC: Directive on Marking of batteries

3.9.3 European (Draft) Directives

Third Draft Directive for Waste From Electrical and Electronic Equipment (WEEE)

Draft Proposal for a new Batteries Directive (to replace 91/157/EEC and 93/86/EEC)

Proposal for a Directive on Climate Change Levy

Annex 2 Appendix 5

TITLE: ISO 14001 – Environmental Information for Bids

AUTHOR: G.J.Collins

DOCUMENT STATUS: Draft 1

SUMMARY: This document provides information that can be used in the production of bids on requests from ICL's customers that relate to ICL's Corporate Environmental Policy and Targets, main environmental achievements, environmental performance measures and environmental management.

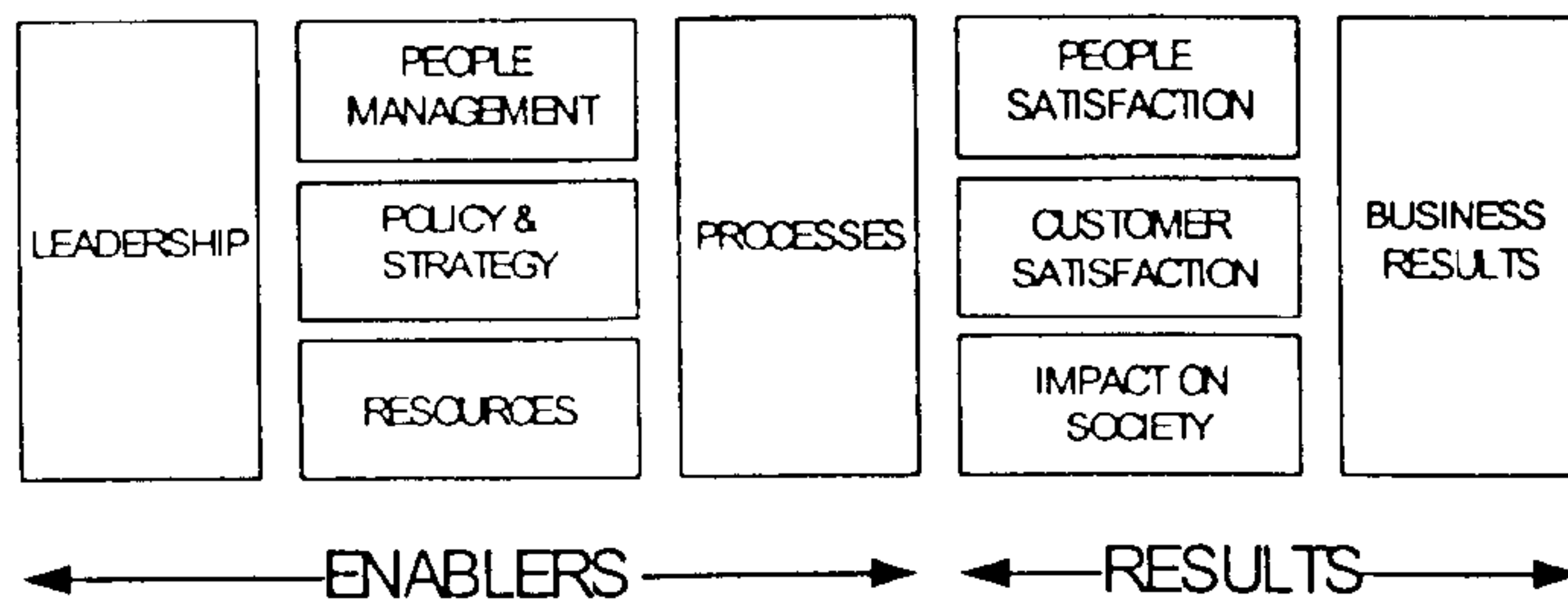
AUTHORISED BY:

Head of Corporate Environmental Affairs Joy Boyce Signature Date

Issue	Date	Reason for change
1	1-9-99	1 st Draft

Introduction

ISO 14001 is an international standard on environmental management systems. ICL has made a corporate commitment to implement an environmental management system in line with this standard at all its major sites and gain ISO 14001 certification. This environmental management system is to be established according to ICL business operations and is to address all environmental impacts associated with ICL's activities. ICL has already taken steps to minimise such environmental impacts through both the implementation of an environmental policy and through the ICL quality improvement drive centred around the European Foundation for Quality Management model. The model, which in ICL is called the Strategic Quality Model, includes "Impact on Society" which includes the environment. ICL is assessed against the model, actions are taken to improve and measures are put in place to determine the success of the actions. This cycle is continuously repeated and ICL's processes are also benchmarked against those of other best practice companies.



The ICL Strategic Quality Model

Responsibility

ICL's commitment to the environment is demonstrated by the establishment of an Environmental Affairs Department within ICL Group. This department sets policy and communicates policy and relevant legislative changes to the ICL businesses. The Corporate Environmental Department is responsible for writing and communicating the, ISO 14001 compliant, generic environmental management system for the ICL Group.

ICL Environmental Policy

ICL maintains an Environmental Policy, as included in appendix A. This is communicated down through the Business Groups and Divisions to all staff through normal communication channels. The policy is also made available to customers and the public and is published on the ICL intranet site, Cafevik.

In addition to the ICL Corporate Environmental Policy, ICL management's environmental requirements for the ICL Businesses are specified in a document called the ICL Policy Framework. These include:

- Each Business shall have Environmental Auditors trained through an accredited EARA training course
- A schedule of environmental audits shall be implemented across all ICL sites
- ICL sites shall develop Environmental Management Systems (EMS) and work towards registering the EMS as conformant with ISO14001

ISO 14001 Registration

Each ICL Division has a small team of auditors qualified to perform Environmental Management System Audits against the requirements of ISO14001. Audits are performed upon a particular Division's sites where it has site management responsibility. Improvement actions, when identified as necessary, are implemented.

Recycling

ICL's recycling policy is deployed across the ICL Group in many areas. When necessary, special collection facilities are deployed to encourage staff to save recyclable material. The amount of material collected for recycling is measured and records are maintained to demonstrate progress.

3.10 Computer and other equipment

Returned computer and other similar equipment is collected and transported to a specialist unit for dismantling and recycling. ICL has a programme for working in partnership with its customers for employing best practice in the take-back and recycling of waste electrical and electronic equipment. ICL stringently audits its own and its recyclers operations to ensure that they meet certain environmental criteria and standards.

3.11 Consumables

The following are collected for recycling at ICL sites:

- Used copying/printer paper
- Plastic machine coffee cups
- Aluminium drink cans
- Cardboard packaging
- Plastics packaging

Use of Recycled materials

ICL purchases and uses the following recycled materials whenever practical:

- copying paper
-

Energy conservation

Energy conservation to reduce the environmental effects of power station discharge is also of course financially beneficial to ICL. Initiatives to reduce energy consumption year on year are in place across ICL with measures and regular reports required from site management.

Many ICL sites are designed to be energy efficient, with high levels of insulation to reduce heat loss and to reduce the effects of traffic noise pollution on ICL staff working in the building.

ICL staff are encouraged to switch off personal computing equipment overnight and when not in use. Increasingly PC's in use have automatic switch-off devices for video screens and energy saving shut down modes for PCs and laptops.

Use of environmentally friendly materials

Recyclable materials are used wherever possible in the manufacture of ICL equipment. Materials and processes potentially damaging to the environment are avoided during manufacturing wherever possible. Materials known to be damaging to the environment when disposing of equipment at the end of its useful life are also avoided.

The selection criteria for ICL's suppliers include acceptable environmental practices.

Report Number 6

Annex 3

Annex 3

The UK Packaging Regulations, Recent Changes and Impacts on ICL

Appendix 1

Summary of the Impacts of Environmental Legislation on ICL (based on a Corporate Presentation by Joy Boyce)

Appendix 2

Summary of the Recent Consultation Process Concerning the UK Packaging Regulations

Appendix 3

Schematic to Show ICL's Compliance to the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997

**Annex 3 Appendix 1:
Summary of the Impacts of Environmental Legislation on ICL (based on a Corporate
Presentation by Joy Boyce)**

The UK Government's approach to environmental issues seems to be much more proactive than the last Government and the ever-increasing amount of European environmental legislation is driving much UK Government activity in this area. New policy areas that have become active include tackling the environmental impacts associated with transport, the climate change levy, packaging and waste from electrical and electronic equipment. In addition to these areas the UK Government appears to be taking the lead on Integrated Product Policy (IPP).

Companies like ICL are being asked by the UK Government to produce 'green transport plans' and John Prescott is planning to introduce enabling legislation for local authorities to tax road usage in congested cities and to impose a tax on company parking spaces. ICL's response to this has been to begin opening communication channels with the local authorities around its main sites. ICL is hoping to negotiate with local authorities whereby they can offset car parking space taxation with green transport plans. ICL's green transport plans have been kicked off with a survey of employee transport practices and it is the company's intention to prove increased home working and teleconferencing etc. and the company will need to introduce measures which this research project will facilitate.

The UK Government is intending to use fiscal instruments to curb the increasing use of energy by industry and business in order to enable the UK to meet its targets for reducing greenhouse gas emissions. The revenues raised from industry by this climate change levy will be fed back into the industry by the reduction of National Insurance Contributions by 0.5%. Industry should benefit from renewable energy sources such as wind or solar power and ICL will need to look to supporting these schemes and measuring the energy that it has used from different sources.

As far as the UK Packaging Regulations are concerned, there are still real problems perceived by many with the Producer Responsibility Notes (PRNs). Industry paid £70 million for PRNs last year and yet there is no transparency as to where this money has gone. Linked to this is the concern that the infrastructure for recycling of packaging waste has not increased significantly and that the UK will be unable to meet the targets set by the EU. However, the increased cost necessary for gaining transparency is stopping it from happening. There has recently been a consultation process on Packaging Waste which is covered in Appendix 2 of this Annex.

The UK has no plans to legislate on waste from electrical and electronic equipment (WEEE) until it transposes the European Directive on WEEE. For the financing of the recovery of WEEE a packaging PRN system equivalent is being considered and it is highly likely that even if the European Directive does not specify the use of this system, the UK Government will. Several IT companies are currently assessing the viability of setting up a voluntary registration scheme for business to business management of WEEE. The implications for ICL's environmental information requirements are enormous. The work on developing the necessary information systems for packaging is, therefore, looking more important as it will be invaluable in laying down the foundations for the information requirements of WEEE.

Annex 3 Appendix 2

Summary of the Recent Consultation Process on the Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 and its impact on ICL

Note: There were two consultation papers published recently, the one that applied to ICL and similar industries is the one covered here as the other bears no relevance

Title: “Consultation Paper on Changes to the Percentage Activity Obligations and Other Matters”

The Issues Covered:

In addition to issues such as: the implications of The Competition Act 1998 for the regulations; the threshold test reduction planned for 2000; and the Environment Agency’s fee. The following are the main issues for ICL that are covered in the document:

1. Changing the Percentage Activity Obligations

Due to heavy lobbying by the packaging convertor sector that the costs of complying with the regulations are disproportionate, it is proposed that the convertor activity obligation should be reduced by 2% and that the pack/filler and retailer obligations should both be increased by 1%. This means an increase in ICL’s activity obligations.

2. Reporting Quaterly on Compliance

During the second half of 1998 and the early part of 1999, the market for PRNs slowed and prices now are lower than those prevailing at the same time in 1998. In addition, the erratic prices of PRNs has led to some companies delaying buying PRNs until later in the year, further exacerbating the problem, and implying that there will be a last-minute rush at the end of the year for reprocessing capacity and the related PRNs. This lack of stability in the market means that reprocessors are not confident of the level of demand for their PRNs and there is concern that this will lead to a lack of investment which in turn threatens the capability of the UK to meet the 2001 targets. It is proposed in the consultation paper that a means to combat this would be for businesses to report on their compliance and discharge of their recovery and recycling obligations quarterly as opposed to annually. This, however, would impose a greater administrative burden on the Environment Agency and all companies affected by the regulations. ICL was able to provide a unique response to this part of the consultation process because it has already been attempting to collect quarterly reports from all its business divisions according to its compliance plan (24 month dissertation, Appendix 1, p.30). ICL has found it almost impossible to gather this data on a quarterly basis and related this problem in its response to the consultation process.

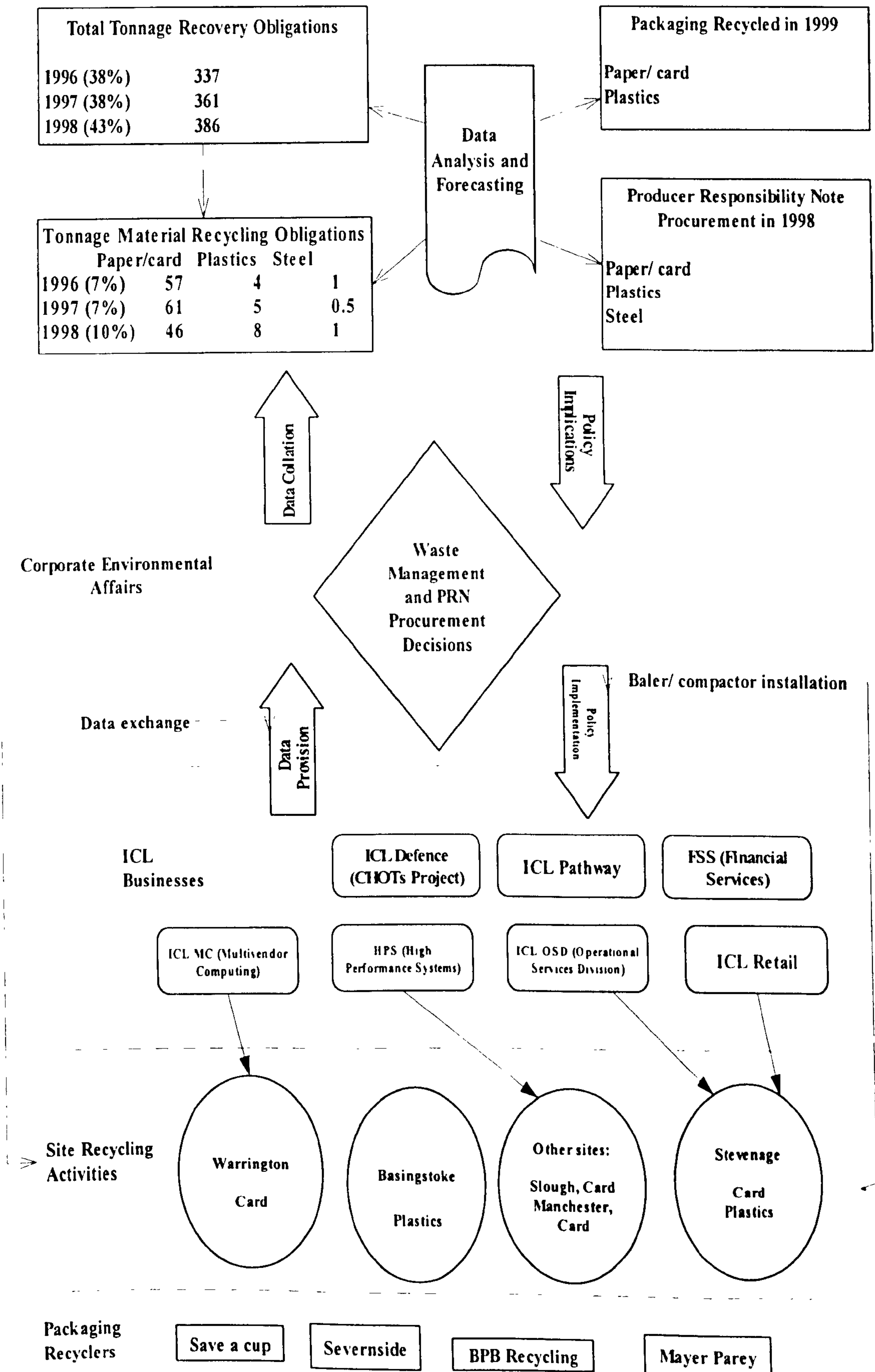
3. Forward Planning by Go-it-Alone Businesses

To facilitate the necessary capacity and collection infrastructure to meet the mandatory targets and to bring requirements on go-it-alone businesses into line with those on compliance schemes, some businesses have proposed that producers registered individually should provide a compliance plan indicating how they plan to discharge their obligation up to 2001. This poses no real difficulties for ICL except that a formal document would need to be drawn up based on the existing compliance plan and detailing the intentions for PRN purchase in the format required.

Annex 3 Appendix 3

Schematic to Show ICL's Compliance to the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997

**A Schematic to show ICL's Compliance to the
UK Packaging Regulations**



Report Number 7

38 Month Report

1. Introduction

Over the last six months the research has concentrated on packaging as an industry-wide environmental performance indicator (EPI). A survey is being carried out to ascertain the impact of the UK Packaging Regulations on the environmental performance of companies and their related environmental performance measures (PRCEP Survey). In particular it is looking to see if joining a compliance scheme or choosing to comply with the regulations on an individual basis is having some bearing on the environmental performance of a company.

The survey has been expanded to look at the effect of European Packaging Directive on companies in various member states by issuing an adapted version of the questionnaire to EICTA (European Information and Communications Technology Industry Association) members. EICTA was formed from ECTEL and EUROBIT and its members include national organisations and individual companies from both the IT and Telecommunications industries.

Survey Methodology

From the Environment Agency's database it was calculated that the sample would need to be stratified for 80% compliance scheme registered and 20% individually registered. Using a formula for sampling the sample size was calculated as follows:

$$n = \frac{NZ^2 * .25}{[d^2 * (N-1)] + [Z^2 * .25]}$$

Where n = sample size required

N = total population size (from EA database the total number of registered companies is 3783)

D = precision level (0.1)

**Z = number of standard deviation
units of the sampling distribution
corresponding to the desired
confidence level (for 95% confidence
level Z = 1.96)**

Hence:

$$n = \frac{3783 * 1.96^2 * .25}{[.1^2 * (3782)] + [1.96^2 * .25]} = 94$$

Stratification of sample:

$$94 * .8 = 75$$

$$94 * .2 = 19$$

For an expected response rate of 10%:

$$\text{Sample size} = n / .1 = 940$$

Therefore, the number of Individually Registered Companies to be sampled needs to be 188 and the number of Compliance Scheme Registered companies to be sampled needs to be 752 making a total sample size of .

It was decided from this that the questionnaire should be sent out to 1000 companies, 200 of which should be individually registered and 800 registered with compliance schemes.

The sample was selected from the Environment Agency database by the random sampling method. This was achieved using the random sampler in excel. Once the sample had been selected and a new database created, the samples names and addresses were transported into a word document using mail merge. Letters could

then be printed off in an automated fashion and sent out with the questionnaires and stamped addressed reply envelopes.

The questionnaire was then adapted for companies having to comply with packaging legislation in European Member States. This was then sent out to all EICTA members.

Summary of Progress

Each objective is laid out as follows:

Objectives

Deliverable

Dates

Progress

2.1 To review the environmental information requirements and flows within a multinational information technology business.

1) Develop model of information flows within the company and industry

Completed 31/9/96

To be refined 1/5/2000

2) Review CEA activities and environmental status of environmental data collection

Completed 31/9/97

2.2 To review the impacts of current and future environmental legislation on the information requirements and environmental performance of the company.

1) Review environmental legislation directly relating to ICL's operations.

Completed 31/9/96

Updated 31/9/97

Updated 30/9/99

2) Review packaging legislative information requirements.

Completed 31/9/96

Updated 31/9/97

Updated 30/9/99

Update on UK Producer Responsibility Obligations (Packaging and Packaging Waste) (Amendment) (No.2) Regulations 1999 (See Annex 1, Appendix 1)

3) Packaging legislation's impact on ICL's environmental performance.

Completed 31/9/98

Review updated 30/9/99

ICL's Compliance Activity Documents (See Annex 1, Appendix 2)

2.3 To design, develop and implement a system for ICL to meet the environmental information requirements reviewed with particular emphasis on legislative demands.

1) Produce packaging legislation information requirements logic model

Completed 31/3/98

2) Integrate information into ICL's information systems and establish necessary communication channels, including suppliers

This has not been completed due to the various organisational changes and the expansion of the research in other directions, particularly the PRCEP survey.

4) Framework development for information infrastructure, including software applications where necessary

To be completed by 30/9/2000

2.4 To apply the current knowledge on environment-related performance measurement to ICL's information needs to ensure the organisation has practical tools with which to meet its Corporate Policy and Targets. To develop

appropriate relative and normalisation techniques to performance measurement within ICL.

1) Assessment of current literature on environmental performance measures

Completed 15/1/99

2) Assess case studies of the applications of performance indicators

To be completed by 30/3/99

Completed (Annex 2, Appendix 1)

3) Application to ICL's performance evaluation requirements

Completed (Annex 2, Appendix 2)

4) Development of measures, incorporating techniques

In Progress – to be completed by 1/5/2000

2.5 To integrate such environmental performance measurement into the process of ISO14001 implementation within the company. To ensure that such measures facilitate continuous improvement programs within ISO 14001.

1) Production of generic literature to support ISO 14001 incorporating performance measures

This work is still in progress as it is dependant on the measures development.

Progress to date is in 32 Month Progress Report.

To be completed by 1-5-2000

3) Review measures robustness in demonstrating continuous improvement against company targets

This is looking unlikely to be achieved as ICL has not yet begun implementing its ISO 14001 programme.

- 4) Assess measures capacity to meet ICL's stakeholder and reporting requirements, including benchmarking

To be completed by 31/7/2000

The production of ICL's first Corporate Environmental Report should enable this assessment to be made.

2.6 To assess packaging as a universal environmental performance indicator and to ascertain the impact of the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 on the environmental performance of firms

- 1) Produce and send out a questionnaire on the UK Packaging Regulations and Environmental Performance to 1000 companies, stratified according to those that are members of compliance schemes and those that are registered individually. (Annex 3, Appendix 1)
- 2) Adapt questionnaire for EU member states and the impact of national packaging legislation on the environmental performance of companies and send out to EICTA representatives. (Annex 3, Appendix 2)

2.7 Publish papers relevant to research focus in academically vetted journals within four months of completed research

- 1) Paper I: The UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 - A Methodology for Compliance.
- 2) Paper II: The Impact of the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 on the Environmental Performance of Companies.

Paper I (To be submitted by 10/4/2000) Paper II (17/5/2000)

- 3) Paper III: Environmental Performance Measures in ISO 14001 for continuous improvement in a Service-Oriented Company – ICL Case Study

To be submitted by 29/5/2000

3. Summary of Future Work

- Track developments of the Global Supply Chain initiative within ICL and its implications for packaging data management and update information flow model
- The packaging database project is to be continued with a new contact and a new system (3PI is to be replaced with Enterprise Reference Service, ERS)
- Continue to develop ICL's generic EMS documentation to include Environmental Performance Indicators Manual and Procedures for Environmental Performance Measurement
- Analyse data from survey replies and produce report
- Write papers
- Write Thesis (Outline document, Annex 4)

Report Number 7

Annex 1

Annex 1

Appendix 1: Update on UK Producer Responsibility Obligations (Packaging and Packaging Waste) (Amendment) (No.2) Regulations 1999

The second set of amendment regulations came into force in December 1999, making further changes to the provisions contained in the regulations. The amendment regulations alter the percentage activity obligations under the regulations as shown below:

Percentage Activity Obligations

Producer	Obligation until 31 December 1999	Obligation from 1 January 2000
Converter	11%	9%
Packer / filler	36%	37%
Retailer	47%	48%

The amendments regulations also:

- Increased the fees for registering producers and schemes by 27% to £950 p.a.
- Changed the threshold tests to over £2 million turnover (replacing £5 million turnover) and over 50 tonnes of packaging handled from 1 January 2000.
- Requires individually registered businesses with a turnover in excess of £5 million to provide a compliance plan to the relevant Agency.
- Removed the wholesaler obligation.
- Requires that data be supplied on a form provided by the Agency.
- Permits producers using reusable packaging to spread their obligations over four years.
- Requires the Environment Agency and the Scottish Environment Protection Agency (SEPA) to publish details of their monitoring policy from 2000 onwards.

The DETR are to produce two consultation papers shortly one of which is to be on PRNs. ICL is intending to produce a response on this.

Annex 1

Appendix 2: ICL's Compliance Activity Documents (written by the author)

ICL's Compliance Certificate 1999

ICL's Compliance 1999 Data for Registration 2000

ICL's Compliance Plan for Registration 2000 (Based on the Business Plan submitted in Appendix 1 in the 24 month dissertation)

The Producer Responsibility Obligations (Packaging Waste) Registrations 1997

CERTIFICATE OF COMPLIANCE - 1999

ICL plc.

Registration Number: EI19971074

1. I am the person approved by the Environment Agency to issue this certificate.
2. This certificate is issued in accordance with guidance issued by the Agencies in July 1997 (i.e. *Guidance on Evidence of Compliance and Voluntary Accreditation of Reprocessors* booklet).

3. Registered office of the producer: ICL plc.
26 Finsbury Square
London
EC2A 1DS
Tel: 0171-638-5622

Address for the service of notices as letter heading

4. A copy of the data forms submitted with the registration form for 1999 are enclosed with this Certificate
5. A return, as required by Regulation 22, is enclosed with this Certificate in the form of copies of the following PRNs:

Recycling obligation:

Plastic	0000359	4 Tonnes	Chase Plastics Ltd.
Plastic	0000442	4 Tonnes	Chase Plastics Ltd.
Card	0032642	46 Tonnes	BPB Recycling
Steel	63269	1 Tonne	Mayer Environmental

Recovery obligation:

Steel PERNs	63269	309 Tonnes	Mayer Environmental
Card	0024014	2 Tonnes	BPB Recycling

6. Evidence relating to this Certificate of Compliance will be kept in a secure place for at least four years and will be provided and made available to the appropriate Agency for inspection if requested.
7. I certify that the information I referred to in this Certificate is true to the best of my knowledge and belief, and that the Producer has complied with its obligations under the Regulations for 1999.
8. Name: Keith Todd, CEO

Signature:

Date:

Table 1. Packaging Supplied

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	258	0	0	4	47	1000	0
selling	1811	0	0	4	144	726	0

* this refers specifically to wholesaler packaging which is sold to a retailer who is exempt under the regulations and has not registered with the EA

Table 2a: Packaging Exported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	120	0	0	1	5	35	0
selling	142	0	0	1	6	34	0

Table 2b: Packaging Exported by a 3rd party

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	0	0	0	0	0	0	0
selling	0	0	0	0	0	0	0

Table 3 Packaging Imported

	paper	glass	metal		plastic	wood	other
			aluminium	steel			
wholesaler	0	0	0	0	0	0	0
wholesaler*	0	0	0	0	0	0	0
pack/ filling	21	0	0	0	4	32	0
selling	201	0	0	0	8	32	0
transit packaging around imports	7	0	0	0	2	7	0

Table 4 Re-Use (optional)

Paper		5
Glass		0
Metals	aluminium	0
	steel	0
Plastics		1
Wood from 1 1 2000		0
Other from 1 1 2000		0

Table 5 Composites (optional)

Paper		0
Glass		0
Metals	aluminium	0
	steel	0
Plastics		0
Wood from 1 1 2000		0
Other from 1 1 2000		0

Table 6 Levels of Recovery and Recycling

Recovery			0	
Recycling	paper		145	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		4	
				0

Table 7 Obligation (to be completed by Corporate Environmental Affairs)

Recovery obligation			477	
Recycling obligation	paper		126	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		11	
			0	

Calculation	Paper	Glass	Alu	Steel	Plastic	Wood	Other	Total
Act obl	853	0	0	3	82	690	0	
Imports obl (Roll-up)	115	0	0	0	7	28	0	
Total Recv obl	435	0	0	1	40	323	0	
Total Recl obl	126	0	0	0	11	93	0	477

**ICL's Compliance Plan 2000
 Under The UK Producer Responsibility Obligations (Packaging Waste)
 Regulations 1997**

I Statement of ICL's Obligations

ICL plc has registered with the Environment Agency independently of collective schemes in compliance with the Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997.

The packaging which ICL uses comprises paper/ card, plastics, steel and wood. ICL's statement of obligations to the Environment Agency for 1999 packaging flows is shown in the table below.

ICL's Statement of Obligations (1999 Data in Tonnes)

Recovery obligation			477	
Recycling obligation	paper		126	
	glass		0	
	metals	aluminium		0
		steel		0
	plastic		11	

II ICL's Compliance Activities

Information Management

The data on packaging flows throughout ICL operations, as required by the legislation, is collected and centralised from the following list of ICL businesses:

- ICL Multivendor Computing (ICL MC)
- ICL Operational Services Division (OSD)
- ICL Retail
- High Performance Systems (HPS)
- Financial Systems Services (FSS)
- ICL Pathway

Two basic methods have been employed with regard to data generation. These were, firstly, to identify and measure generic packaging types and secondly, to identify business streams and marry product shipping information with packaging data. Standard Excel spreadsheets have been used to date for reporting purposes. There is now a project underway to utilise Access Databases and to adapt ICL's newly centralised Corporate Information System, currently under development, to include comprehensive data on packaging types and weights. This will greatly improve the data collection process.

III ICL's Waste Strategy and Packaging Recovery Notes (PRNs)

ICL's Packaging Waste Arisings

A waste measurement strategy concentrating largely on packaging waste was designed as part of an environmental waste review carried out at ICL's largest site, the Stevenage campus. This detailed audit yielded the amounts of packaging waste arising at two of ICL's major warehouses. Two further waste measurement audits were carried out at a third major ICL warehouse at Warrington. The results of all the waste measurement reviews carried out were correlated, in terms of material flows, with total annual waste information from the contracting waste management companies. This enabled estimates to be calculated of average packaging waste arisings from the two sites, and therefore, how much packaging waste is available for recovery and recycling.

The aim of the exercise was to establish how closely ICL could meet its packaging waste obligations under the UK packaging legislation from these two sites. The results were analysed and a comparison made between the ICL's obligation for 1998, based on 1997 data, and the waste arisings for the two sites. The results clearly showed that ICL could meet its packaging obligations from the two sites, thus minimising the environmental impacts, such as transport. Other savings include the associated costs of collecting packaging from customers and the cost of logistics for the return of packaging.

As part of ICL's waste management strategy programme, a system of documentation and audits for all packaging wastes sent to waste management companies and reprocessors is being set up. This will be carried out for each site with appreciable packaging waste arisings, i.e. Stevenage and Warrington etc. It will be based on the audit data outlined above.

PRN Procurement

Where ICL's reprocessors have not provided PRNs for any reason, or where in CEA's judgement the PRN prices being charged have been unacceptably high, alternative arrangements with other reprocessors have been made.

Plastics

In previous years due to the collection and recycling plastic cups using the Save a Cup scheme across ICL sites, PRNs have been purchased from Save a Cup.

ICL has purchased a special EPS compactor for the Basingstoke site for the large amount of plastics returned to the site. The resulting blocks of compacted EPS will be recycled into wood replacement products by a company on the Isle of Wight.

To cover 1998 obligations, ICL bought plastic PRNs from Chase Plastics Ltd who recycle ICL's plastic packaging waste. This year we have purchased plastic PRNs from the same reprocessors.

Cardboard

There is a sorting process at ICL's main warehouse sites at Stevenage and Warrington for waste cardboard packaging. The Stevenage site uses Cleanaway as its waste management company who deliver cardboard for recycling at St Regis and plastics at Linpac. There is also a compactor for cardboard recycling at ICL's Group Operations site in Slough. Cardboard PRNs are purchased from BPB Recycling as a reprocessor of ICL's cardboard packaging waste.

The remainder of ICL's recovery obligations and its obligation to recover a minimal amount of Steel was covered by the purchase of PRNs from Mayer Environmental. ICL expects to buy PRNs for this year's obligation from the same reprocessors. However, ICL will be watching the market and may adapt its PRN purchasing decisions on the basis of this.

Report Number 7

Annex 2

Annex 2

Appendix 1: Assessment of Case Study Material on the Applications of Environmental Performance Indicators

The following table is the results of examining case study material on environmental performance measures and extracting those which may apply to service-oriented/ non-manufacturing organisational functions. Most of the data has been gathered from corporate environmental reports.

Measures	LucasVarity ¹	Mining Sector ²	Amerrada Hess Ltd 1998 CER	Wilkhahn 1995 CER	Body Shop 1997 CER	Sainsbury's 1997 CER	Fujitsu 1998 CER Environmental Accounting
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Operational Performance Indicators

Energy Consumption	mWh mWh/employee Cost				kWh % change kWh/ 1000 unit products distributed	kWh/ m ²	
Transport					km covered Fuel consumption litres Fuel efficiency km/ litre t CO ₂ emitted by UK fleet no cars in fleet air miles no of flights car journeys by employees no of deliveries/ collections from suppliers	gallons/ vehicle miles/ gallon	
Global warming	t CO ₂ equivalents (VOC/ O _x / CO ₂)	kg CO ₂ equivalents/ t material moved	t CO ₂		t CO ₂	Kg CO ₂ /m ²	
Acid Rain	SO _x t	SO _x equivalents/ t material moved NO _x	t SO ₂				
Smog	NO _x t		t NO _x				
Water	t / employee Cost				m ³ used % change	m ³ Cost	

¹ Source: Lawson, N., "Environmental Performance Indicators in Industrial Management Systems" EngD Dissertation, 1998

² Source: Peck, P., "Operational EPIs for the Mining and Metals Sector" IIIIE MSc Thesis, 1997.

Measures	LucasVar ity ¹	Mining Sector ²	Amerrada Hess Ltd 1998 CER	Wilkhahn 1995 CER	Body Shop 1997 CER	Sainsbur y's 1997 CER	Fujitsu 1998 CER Environmenta l Accounting
Waste Disposal	t / employee Cost		t	t municipal waste t building rubble t special waste (broken down)	t to landfill t obsolete stock t obsolete stock to landfill		
VOCs lost	t / employee Cost						
Environme ntal incidents		No of incidents					
Material input				kg materials			
Material output				kg materials			
Material consumpti on				kg consumable s			
Recycling				kg thermal recycling kg recycling (broken down)	t waste incemerated t waste recycled	'000 t card plastic	

Management Performance Indicators

		no of fines or penalties	No of Prosecutions Letters of warning				
Suppliers						% age supplies meeting certain criteria	
Financial Costs					Utility Costs (gas, electricity and water)		Direct and Indirect Costs Energy Conservation Costs Recycling Costs Information Costs Risk Prevention Costs
Financial Benefits							Energy conservation Recycling Risk Mgt Environmental activities Business efficiency education

¹ Source: Lawson, N., "Environmental Performance Indicators in Industrial Management Systems"
EngD Dissertation, 1998

² Source: Peck, P., "Operational EPIs for the Mining and Metals Sector" IIIIE MSc Thesis, 1997.

Annex 2

Appendix 2: Application to ICL's Environmental Performance Evaluation Requirements

The following table has been constructed on the basis of the previous table in appendix 1 utilising the guidance notes from ISO 14031¹ and integrating the information from the feasibility study data on environmental performance indicators for ICL². Environmental condition indicators (ECIs) have not been included because the data is not only difficult or impossible to obtain but I think more relevant to the environmental performance evaluation of geographical areas rather than companies.

Environmental Aspect	Environmental Impact	Environmental Performance Indicators		Measurement Status
		Operational Performance Indicators	Management Performance Indicators	
Energy Use	Natural Resource Depletion	kWh % change kWh/ employee kWh/ m ²	cost (including climate change levy) cost of energy efficiency initiative surveys	All data available although currently only total kWh collected
	Global Warming	tCO ₂ tCO ₂ / m ² tCO ₂ equivalents	cost of energy efficiency technologies	
	Acidification Smog	t SOx t NOx, particulates		
Transport	Natural Resource Depletion	business miles travelled (road and air) fuel consumption litres t CO ₂ t NOx t SOx particulates no videoconferences plus mileage and emissions saved fleet fuel efficiency miles/ litre no of vehicles in fleet % age vehicles with catalytic convertors no of deliveries/ collections from suppliers		Currently collect business mileage and videoconferencing data airmileage data could be collected no of vehicles in fleet and % with catalytic convertors is available fuel efficiency availability is unknown deliveries and collections from suppliers unknown

¹ EngD Conference Paper 1999, 32 month report, Annex 1 pg. 10-11

² Source: EngD Conference Paper 1999, 32 month report, Annex 1 pg. 10-11.

Environmental Aspect	Environmental Impact	Environmental Performance Indicators		Measurement Status
		Operational Performance Indicators	Management Performance Indicators	
Water	Natural Resource Use	m ³ m ³ /employee	cost cost of water conservation technologies	not enough metering on sites data availability unknown costs not collected
Waste	Landfill disposal	t t/ employee t electrical and electronic waste t/ Sales	cost (including landfill levy)	general waste data available but not currently collected electrical and electronic waste data availability unknown costs not collected
Virgin Material Use	Natural Resource Depletion	t paper purchased t plastic cups purchased no. laser printer consumables purchased	cost	purchasing data is currently collected but is inadequate costs not collected
Recycling	Natural Resource Conservation	t packaging recycled (plastic card wood) t plastic cups recycled t paper recycled units laser printer consumables recycled t electrical and electronic equipment recovered for recycling, reuse and refurbishment (includes batteries) t CD ROMs recycled	cost of recycling cost of compactors/bailers cost of waste audits cost of storage facilities	recycling data is collected for packaging, paper, plastic cups and laser printer consumables weee recycling data collected but not aggregated costs not collected
Indirect environmental aspects - suppliers	various	no of consumables purchased containing recycle	no of dfe products (disassembly hazardous substance elimination, low energy consumption, recycle content) no. of ICL Approved Recyclers no of partnerships for asset recovery (product and consumables) no of suppliers queried on environmental issues no of suppliers that have (environmental policy EMS and/or certification)	data unavailable for dfe products and consumable recycle no. of ICL Approved Recyclers is known some data available on partnerships for asset recovery supplier environmental data unknown

Environmental Aspect	Environmental Impact	Environmental Performance Indicators		Measurement Status
		Operational Performance Indicators	Management Performance Indicators	
EMS			no. sites internally audited (until ISO 14001 group certification) no internal auditors trained cost of EMS implementation	no. of sites audited and no. of internal auditors trained known
Environmental Incidents		no environmental incidents	no. warnings/ fines/ penalties cost of compliance	no incidents yet cost of compliance known but not aggregated
Community Relations		commuter patterns (% by car motorbike walk bike train bus)	no. of commuter transport surveys no. of press releases on environment no. of CERs produced no. of enquiries cost of employee transport surveys and employee travel initiatives no. of environmental group/ organisational memberships	commuter survey data collection has started recently

Report Number 7

Annex 3

Annex 3

Appendix 1: Questionnaire on the UK Packaging Regulations and Environmental Performance

Dear Sir/ Madam

RE: UK PACKAGING REGULATIONS AND COMPANY ENVIRONMENTAL PERFORMANCE SURVEY

This survey is integral to an Engineering Doctorate (EngD) research project under Brunel University's Parnaby programme, and forms part of a joint research programme between Brunel's Centre for Environmental Research (CER) (Dr. Sue Grimes) and ICL plc (Corporate Environmental Affairs Manager, Mrs. Joy Boyce).

As a company that is registered with the Environment Agency, you will be well aware of the requirements of the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 on obligated businesses like yourselves. This is an independent piece of research to discover how effective these regulations are in improving the environmental performance of companies and what implications this has for future producer responsibility legislation.

In order for us to formulate an accurate view of the effects of the UK Packaging Regulations on the environmental performance of businesses please could you complete the enclosed questionnaire, the 'UK Packaging Regulations and Environmental Performance Survey', as thoroughly as possible. Responses will be aggregated and analysed and the results will not be attributable to you in any way.

An executive summary of the findings of this survey will be available on request.

I would be grateful if you could return your completed questionnaire by Friday 31st March 2000 to:
PRCEP Survey, Ivy Cottage, ICL Beaumont, Burfield Road, Old Windsor, Berkshire SL4 2JP.

Yours sincerely

Gail Collins
Environmental Research Engineer

UK PACKAGING REGULATIONS AND COMPANY ENVIRONMENTAL PERFORMANCE SURVEY

Section 1: PERSONAL DETAILS

- 1a) Job title (please state) _____
- 1b) Level of authority (please tick)
- | | |
|---|---|
| Chairman/ CEO/MD etc <input type="checkbox"/> | VP/Dir/Asst/Dep.Dir etc <input type="checkbox"/> |
| Senior management <input type="checkbox"/> | Higher functional <input type="checkbox"/> |
| Functional <input type="checkbox"/> | Other (please state) <input type="checkbox"/> _____ |
- 1c) Area(s) of responsibility (please tick)
- | | |
|---|--|
| Legal/Finance <input type="checkbox"/> | Sales/ Marketing <input type="checkbox"/> |
| Human Resources <input type="checkbox"/> | R&D <input type="checkbox"/> |
| Public Relations <input type="checkbox"/> | Production <input type="checkbox"/> |
| Environment <input type="checkbox"/> | Health and Safety <input type="checkbox"/> |
| IT/systems <input type="checkbox"/> | Distribution <input type="checkbox"/> |

Section 2: COMPANY DETAILS

2a) Is your company registered individually with the Environment Agency or with a collective scheme under the UK Producer Responsibility Obligation (Packaging and Packaging Waste) Regulations 1997?

Environment Agency
 Collective Scheme Name of Collective Scheme: _____

2b) Total number of employees in your company?

<1000 1001-4999 5000+

2c) What was the approximate turnover of your company in 1999?

<£1m £1-5m £5-100m £100m-£1Bn £1Bn+

2d) Based on the following FTSE sector indices, please give the percentage of your company's turnover in each sector to the nearest 10%

Oil & Gas	%	Mining	%	Chemicals	%	Construction & Building Materials	%
Forestry & Paper	%	Steel & Other Metals	%	Aerospace & Defence	%	Diversified Industrials	%
Electronic & Electrical Equipment	%	Engineering & Machinery	%	Automobiles	%	Household Goods & Textiles	%
Beverages	%	Food Producers & Processors	%	Health	%	Packaging	%
Personal Care & Household Products	%	Pharmaceuticals	%	Tobacco	%	Distributors	%
General Retailers	%	Leisure, Entertainment & Hotels	%	Media and Photography	%	Restaurants, Pubs & Breweries	%
Support Services	%	Transport	%	Food and Drug Retailers	%	Telecommunication Services	%
Electricity	%	Gas Distribution	%	Water	%	Banks	%
Insurance	%	Life Assurance	%	Investment Companies	%	Real Estate	%
Speciality & Other Finance	%	Information Technology Hardware	%	Software & Computer Services	%		%

P.T.O...

Section 3: ENVIRONMENTAL MEASURES

3.1 How much waste did your company send to landfill in the following years:

	1996	1997	1998	1999
Waste to landfill (Tonnes / 10³ kg)				

3.2 In what year did your company introduce the following measures? Were the measures introduced as a direct result of the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997?

Packaging Consumption	Year	_____	Yes/ No
Packaging Consumption by material type	Year	_____	Yes/ No
Packaging Reused	Year	_____	Yes/ No
Packaging Reused by material type	Year	_____	Yes/ No
Packaging Recycled	Year	_____	Yes/ No
Packaging Recycled by material type	Year	_____	Yes/ No
Packaging Recyclate Purchased/ Used	Year	_____	Yes/ No
Packaging Recyclate Purchased/ Used by material type	Year	_____	Yes/ No

3.3 How much packaging has your company handled in the following years:

Packaging handled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

3.4 How much packaging did your company recycle in the following years:

Packaging Recycled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

3.5 How much packaging containing recycled material has your company purchased and/ or used over the following years:

	1996	1997	1998	1999
Packaging containing recycled material (Tonnes)				

3.6 How much non-packaging material did your company recycle in the following years:

Non-packaging Recycled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

Section 4: ENVIRONMENTAL PROGRAMMES

4.1 Does your company have an Environmental Policy? Yes/ No

4.2 If so, in what year was it introduced? _____

4.3 Does your company have either of the following formal accredited environmental management systems (EMS) in place?

EMAS

ISO14001

4.4 If so, in what year did your company develop its EMS? _____

4.5 What was your company's energy consumption over the following years expressed as either kWh/ UP or kWh/ sq. ft building

Energy Consumption	1996	1997	1998	1999
kWh/ sq. ft				
kWh/ UP				

4.6 To what extent did the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 influence environmental programmes in your company?

A great deal Quite a lot Not very much Not at all

4.7 Please indicate against each of the following statements the ways in which the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 have influenced your company?

	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
a) The regulations have significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The regulations have not affected environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The regulations have had a detrimental effect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The regulations have significantly affected my company's bottom line	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

P.T.O...

Section 5 PACKAGING CONSUMPTION REDUCTION INITIATIVES

5.1 Are you aware of the Packaging (Essential Requirements) Regulations?

5.2 What steps have you had to take, if any, to comply with these regulations?

5.3 How many initiatives for packaging reuse or minimisation have been set up in the following years:

	1996	1997	1998	1999
No. of initiatives				

5.4 How much packaging was reused in your company in the following years:

Packaging Reused (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

5.5 Has your company replaced certain packaging materials with other lighter or more environmentally sound alternatives? Yes/ No

5.6 If so, please give details of what type of packaging materials were replaced, what materials they were replaced with, in what year they were replaced and why:

Original packaging material	Replacement material	Year	Reason for change

Section 6: COMPLIANCE SCHEMES

6.1 Please indicate against the following statements to what extent your company's form of registration has affected your environmental programmes.

6.1.1 Joining a compliance scheme:

	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
a) has significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) has not had any affect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) has had a deleterious effect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.2 Individually registering with the Environment Agency:	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
d) has significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) has not had any affect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) has had a deleterious effect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.2 Please explain why your company has chosen its particular registration route (either to join a compliance scheme or register individually with the Environment Agency)

6.3 Please describe in what ways the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 have improved the environmental performance of your company:

6.4 Please describe in what ways the UK Producer Responsibility Obligations (Packaging and Packaging Waste) Regulations 1997 have had a negative impact on the environmental performance of your company:

Please enter your details below if you would like a copy of the survey report and/or if you would be prepared to discuss this survey further by telephone.

Please send me a copy of the Survey Report Yes/ No

I would be prepared to receive a follow up telephone call Yes/ No

Name: _____ Position: _____

Company: _____

Address: _____

Tel no: _____ Fax no: _____

Email: _____

Thank you for your time in completing this questionnaire

Please return this questionnaire to: **PRCEP Survey, Ivy Cottage, ICL Beaumont, Burfield Road, Old Windsor, Berks SL4 2JP**

Tel: 01753-868181 x2503 Fax: 01753-604032 Email: gail.collins@icl.com

Annex 3

Appendix 2: Questionnaire on Packaging Legislation and Environmental Performance in EU Member States

Dear Sir/ Madam

RE: PACKAGING LEGISLATION AND COMPANY ENVIRONMENTAL PERFORMANCE SURVEY

This survey is integral to an Engineering Doctorate (EngD) research project under Brunel University's Parnaby programme, and forms part of a joint research programme between Brunel's Centre for Environmental Research (CER) (Dr. Sue Grimes) and ICL plc (Corporate Environmental Affairs Manager, Mrs. Joy Boyce).

As a company that is based in Europe you will no doubt be aware of the European Community Directive on Packaging and Packaging Waste (94/62/EC). This is an independent piece of research to discover how effective transposed national legislation has been in improving the environmental performance of companies and what implications this has for future producer responsibility legislation.

In order for us to formulate an accurate view of the effects of national packaging legislation on the environmental performance of businesses please could you complete the enclosed questionnaire, the 'Packaging Legislation and Company Environmental Performance Survey', as thoroughly as possible. Responses will be aggregated and analysed and the results will not be attributable to you in any way.

An executive summary of the findings of this survey will be available on request.

I would be grateful if you could return your completed questionnaire by Friday 28th April 2000 to:
PLCEP Survey, Ivy Cottage, ICL Beaumont, Burfield Road, Old Windsor, Berkshire SL4 2JP.

Yours sincerely

Gail Collins
Environmental Research Engineer

2e) Is your company a member of a collective scheme? Yes/ No

Name of Collective Scheme: _____

2f) Is your company a member of any existing packaging organisations (e.g.

ERRA)? Yes/ No Name of Organisation: _____

Section 3: ENVIRONMENTAL MEASURES

3.1 How much waste did your company send to landfill in the following years:

	1996	1997	1998	1999
Waste to landfill (Tonnes / 10³ kg)				

3.2 In what year did your company introduce the following measures?

3.3 Were the measures introduced as a direct result of packaging legislation?

Packaging Consumption	Year	_____	Yes/ No
Packaging Consumption by material type	Year	_____	Yes/ No
Packaging Reused	Year	_____	Yes/ No
Packaging Reused by material type	Year	_____	Yes/ No
Packaging Recycled	Year	_____	Yes/ No
Packaging Recycled by material type	Year	_____	Yes/ No
Packaging Recyclate Purchased/ Used	Year	_____	Yes/ No
Packaging Recyclate Purchased/ Used by material type	Year	_____	Yes/ No

3.4 How much packaging has your company handled in the following years:

Packaging handled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

3.5 How much packaging did your company recycle in the following years:

Packaging Recycled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

3.6 How much packaging containing recycled material has your company purchased and/ or used over the following years:

	1996	1997	1998	1999
Packaging containing recycled material (Tonnes)				

3.7 How much non-packaging material did your company recycle in the following years:

Non-packaging Recycled (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

Section 4: ENVIRONMENTAL PROGRAMMES

4.1 Does your company have an Environmental Policy? Yes/ No

4.2 If so, in what year was it introduced? _____

4.3 Does your company have either of the following formal accredited environmental management systems (EMS) in place?

EMAS

ISO14001

4.4 If so, in what year did your company develop its EMS? _____

4.5 What was your company's energy consumption over the following years expressed as either kWh/ UP or kWh/ sq. ft building

Energy Consumption	1996	1997	1998	1999
kWh/ sq. ft				
kWh/ UP				

4.6 To what extent has packaging legislation influenced environmental programmes in your company?

A great deal Quite a lot Not very much Not at all

4.7 Please indicate against each of the following statements the ways in which packaging legislation has influenced your company?

	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
e) Packaging legislation has significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- f) Packaging legislation has not affected environmental programmes within my company
- g) Packaging legislation has a detrimental effect on environmental programmes within my company
- h) Packaging legislation has significantly affected my company's bottom line

Section 5 PACKAGING CONSUMPTION REDUCTION INITIATIVES

5.1 Is your company currently complying with national legislation that covers the Essential Requirements? Yes/ No

Name of legislation: _____

5.2 What steps has your company had to take to comply with the Essential Requirements?

5.3 How many initiatives for packaging reuse or minimisation have been set up in the following years:

	1996	1997	1998	1999
No. of initiatives				

5.4 How much packaging was reused in your company in the following years:

Packaging Reused (Tonnes)	1996	1997	1998	1999
Cardboard/ Paper				
Plastic				
Metal				
Wood				
Other (please specify)				

5.5 Has your company replaced certain packaging materials with other lighter or more environmentally sound alternatives? Yes/ No

5.6 If so, please give details of what type of packaging materials were replaced, what materials they were replaced with, in what year they were replaced and why:

Original packaging material	Replacement material	Year	Reason for change

Section 6: COMPLIANCE SCHEMES

6.1 Please indicate against the following statements to what extent your company's compliance route has affected your environmental programmes.

6.1.1 Joining a collective scheme:

	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
b) has significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) has not had any affect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) has had a deleterious effect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.2 Individual Compliance:

	Agree Strongly	Agree Slightly	Disagree Slightly	Disagree Strongly
d) has significantly driven environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) has not had any affect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) has had a deleterious effect on environmental programmes within my company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.2 Please explain why your company has chosen its particular registration route (either to join a collective scheme or individual compliance)

6.3 Please describe in what ways packaging legislation has improved the environmental performance of your company:

6.4 Please describe in what ways packaging legislation has had a negative impact on the environmental performance of your company:

Please enter your details below if you would like a copy of the survey report and/or if you would be prepared to discuss this survey further by telephone.

Please send me a copy of the Survey Report Yes/ No

I would be prepared to receive a follow up telephone call Yes/ No

Name: _____ Position: _____

Company: _____

Address: _____

Tel no: _____ Fax no: _____

Email: _____

Thank you for your time in completing this questionnaire

Please return this questionnaire by Friday 28th April 2000 to: **PLCEP Survey, Ivy Cottage, ICL Beaumont, Burfield Road, Old Windsor, Berks SL4 2JP**

Tel: 01753-868181 x2503 Fax: 01753-604032 Email: gail.collins@icl.com

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Annex 4

ex 4 Outline Document for Final Thesis/ Portfolio

Title Page

Map flowchart (guidelines for the rest of the portfolio)

Abstract

Executive Summary (~ 4000 words)

Contents

Portfolio guidance

Background to ICL plc

The Research Engineer

Executive Summary of the Project

Basis of the Project

Project Background

Overall Goals and Objectives of the Project

Summary of Findings (Contributions to Knowledge)

Thesis Overview (~ 30-40 000 words?)

Acknowledgements

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1. Introduction - Corporate Environmental Information

2. Environmental Indicators for a service-orientated business (ICL Case Study)

2.1 Background and Introduction

2.2 ICL's EPIs

2.3 System for Risk Assessment

2.4 Discussion

2.5 Conclusions

3. UK Packaging Regulations – Impact on ICL plc

3.1 Background and Introduction

3.2 Papers I and II

4. UK Packaging Compliance Scheme Survey – Packaging as an industry wide EPI

'Packaging Regulations and Corporate Environmental Performance'

4.1 Methodology

4.2 Results

4.3 Discussion

4.4 Conclusions

Glossary

References

Bibliography

Six Monthly Reports

All Annexes and Appendices for Six Monthly Reports (Without database data – Sorbus disposition)

Table of Module Assignment Results