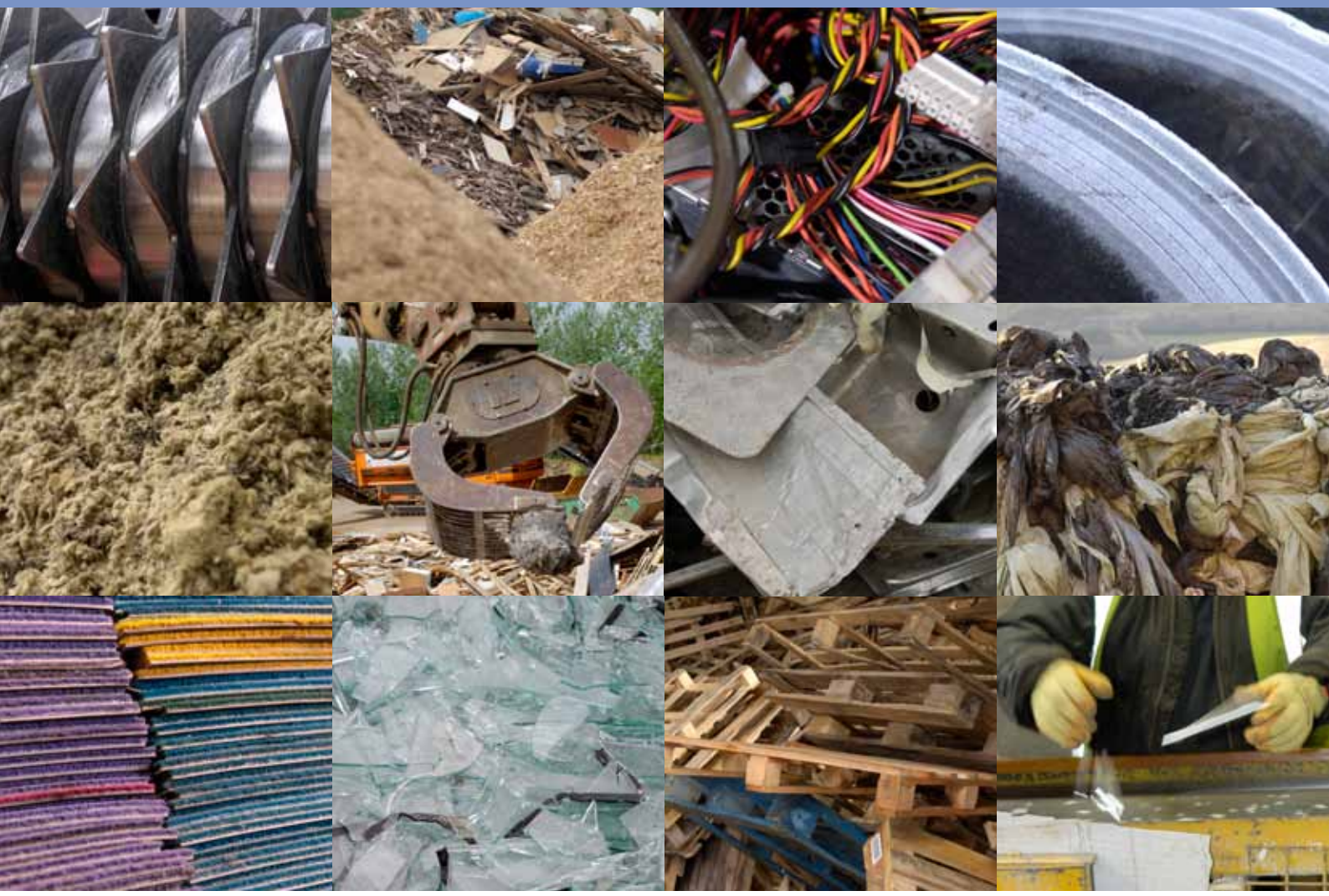
PAS 402:2013

Waste resource management – Specification for performance reporting



ADEILADU ARBENIGRWYDD YNG NGHYMRU

CONSTRUCTING EXCELLENCE IN WALES

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Foreword

This Publicly Available Specification (PAS) was sponsored by Constructing Excellence in Wales (CEW). Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 31 May 2013.

Acknowledgement is given to Paul Jennings and Emma Thomas, who authored the PAS and managed its development for CEW. Acknowledgement is also given to the following representatives that were involved in its development as members of the steering group:

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CEW would also like to recognize the invaluable contribution made by those organizations that took the time to review the working drafts of PAS 402 and who submitted comments for consideration. The contributions helped to improve the specification and are much appreciated.

CEW is the umbrella body for the construction industry in Wales, which makes CEW the business organization for anyone involved with the Welsh built environment. Funded by the Welsh Government, CEW's remit is to improve the construction process in Wales and ensure that the principles of rethinking construction as outlined in the Egan Report 1998, *Rethinking Construction* [1], and the Latham Report 1994, *Constructing the Team* [2], become mainstream industry practice.

This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

The PAS process enables a specification to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Information about this document

This is a full revision of PAS 402:2009 and introduces the following principal changes:

- updated references to legislation, legal terminology, technical specifications and guidance documents;
- textual clarifications within informative notes, Clause **5** (Client relationship), Clause **8** (Competence), Clause **10** (Corrective actions, preventive actions and improvement actions) and **11.3**;
- a new Clause **7** (Operational management), which is an amalgamation of Clause **7** (Operational control) and Clause **8** (Organizational resource management) from PAS 402:2009;
- removal of the first requirement in Clause **11** (Performance review) [**12.1**a) in PAS 402:2009], and amendment to the wording of **11.3** (previously **12.3**).

Supersession

This PAS supersedes PAS 402:2009, which will be withdrawn on publication of this PAS.

Relationship with other publications

This PAS has also been designed to allow waste resource management organizations to use their compliance with related publications to demonstrate performance. A related publication is one that addresses one or more of the requirements of this specification.

Detailed correspondence tables between PAS 402 and existing management system standards for the environment (BS EN ISO 14001), quality (BS EN ISO 9001), health and safety (BS OHSAS 18001) and for identifying common management system requirements as a framework for integration (PAS 99) are given in Annex A.

Detailed guidance on how to complete a waste resource management report conforming to PAS 402 is given in a supporting document published by CEW entitled, *Waste Resource Management – Guidance for Performance Reporting Against PAS 402* [3]. This document will be re-issued to align with PAS 402.

Inspection. Users of this PAS are advised to consider the desirability of third-party inspection of conformity to this PAS. Appropriate conformity attestation arrangements are described in BS EN ISO/IEC 17020. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element. The word "should" is used to express recommendations, the word "may" is used to express permissibility and the word "can" is used to express possibility, e.g. a consequence of an action or an event.

Spelling conforms to *The Shorter Oxford English Dictionary*. Where a word has more than one spelling, the first spelling is used.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

Ministerial statement

PAS 402 forms an important part of the drive towards a zero waste society. Building on the first publication, this revision has provided the opportunity to strengthen the key principles and raise performance standards within the specification requirements.

The revision of the specification has enabled industry and government to work together, collaborating to develop the specification to drive change in a consistent direction. It provides real industry benefits while helping government to achieve its targets. The use of PAS 402 can heighten customer confidence, improve business efficiency and provide validated data for clients and government.

Zero waste is critical if we are to achieve a sustainable future. Achieving this will require a fundamental step change, where rethinking waste management is essential. We need to strive to develop the systems and infrastructure which enable resource lifecycles, where materials discarded can become new resource.

The waste management sector is an important sector to the economy. It has the potential to be a powerful agent for change, with particular regard to sustainable development. The sector has an extremely influential role in transforming the behaviour of those with whom it works to shape the environment.

It gives me great pride that this UK initiative began in Wales, and I recognize that we now have the opportunity to champion its implementation and lead the drive towards better waste management for the UK. My vision is that this sector will be recognized as world class in its ability to deliver a sustainable service which is respected the world over.

I am delighted with this opportunity to mark the publication of this national specification. My thanks go to the Constructing Excellence in Wales team and those representatives who have been involved in its development. Their efforts have enabled the publication of this specification and help move us towards a truly sustainable approach to managing our waste.

Alun Davies
Minister for Natural Resources and Food
Welsh Government

Introduction

The waste industry is constantly evolving. The industry has recognized the potential opportunities to be gained from recovering the resource in waste. In fact, waste is a resource in its own right.

The aim of PAS 402 is to provide a specification for performance reporting that can be adopted by waste resource management organizations.

The specification provides the framework for the demonstration of performance against key areas of delivery, including landfill diversion and materials recovery, assuring potential and existing customers of the service they are procuring. It is the aim of the resulting performance report to present a full and true description that is appropriate to the nature and scale of the organization.

It is important that it is written in accordance with the principles of transparency, completeness, relevance, accuracy, comparability, clarity, timeliness and auditability.

The construction, demolition and excavation (CD&E) sector generates more waste than any other sector but it is hard to define CD&E waste because many of the component parts can be found in waste generated by other sectors. Therefore, in consultation with the waste industry, it was decided that PAS 402 would be developed for all types of waste, however it is generated.

1 Scope

This PAS specifies requirements for performance reporting by a waste resource management organization.

It requires a waste resource management organization to report:

a) how it conducts specific waste resource management activities (Clause **3** to Clause **10**); and

b) the landfill diversion and material recovery rates it achieves (Clause **11**).

It is applicable to a waste resource management organization that processes industrial, commercial or household waste at a transfer station, treatment facility or disposal site.

It is not applicable to a waste resource management organization that operates solely as a waste carrier or waste broker.

NOTE 1 *Detailed guidance on how to complete a waste resource management report conforming to PAS 402 is given in a supporting document published by CEW entitled,* Waste Resource Management – Guidance for Performance Reporting Against PAS 402 *[3].*

NOTE 2 *Correspondence tables that show the relationship between the clauses from Clause **3** to Clause **11** and existing management system standards are given in Annex A.*

NOTE 3 *Waste resource management organizations are required by legislation in England, Northern Ireland, Scotland and Wales to be authorized to perform their activities.*

2 Terms and definitions

For the purposes of this PAS, the following terms and definitions apply.

2.1 business contingency plan (BCP)

documented collection of procedures and information that is developed, compiled and maintained in readiness for use in an incident to enable an organization to continue to deliver its critical activities at an acceptable pre-defined level
[BS 25999-1:2006, **2.6**]

2.2 client

organization that produces or manages waste

2.3 collection

gathering of waste, including the preliminary sorting and preliminary storage of waste, for the purposes of transport to a treatment facility
[European Communities Directive 2008/98/EC on waste [4], Article 3(10)]

2.4 commercial waste

waste from any premises used wholly or mainly for trade, business, sport or entertainment (excluding household and industrial waste)
[Environmental Protection Act 1990 [5], abbreviation of Section 75(7)]

NOTE *A detailed description of which wastes are classified as commercial waste is given in The Controlled Waste (England and Wales) Regulations 2012 [6] and The Controlled Waste (Amendment) Regulations (Northern Ireland) 2003 [7].*

2.5 controlled waste

household, industrial and commercial waste
[Environmental Protection Act 1990 [5], Section 75(4)]

NOTE *A detailed description of which wastes are classified as household, industrial and commercial waste is given in The Controlled Waste (England and Wales) Regulations 2012 [6] and The Controlled Waste (Amendment) Regulations (Northern Ireland) 2003 [7].*

2.6 corrective action

action to eliminate the cause of a detected nonconformity
[BS EN ISO 14001:2004, **3.3**]

2.7 disposal

operation which is not recovery even where the operation has, as a secondary consequence, the reclamation of substances or energy
[European Communities Directive 2008/98/EC on waste [4], Article 3(19)]

NOTE *A list of waste operations that may lead to disposal is given in European Communities Directive 2008/98/EC [4], Annex I.*

2.8 disposal site

site where waste is disposed

NOTE *For example, landfill.*

2.9 duty of care

duty of any person who produces, imports, carries, keeps, treats or disposes of controlled waste or as a broker has control of such waste to ensure that the waste is managed properly, recovered or disposed of safely, does not cause harm to human health or pollution of the environment and is only transferred to someone who is authorized to receive it

NOTE *Duty of care is stipulated in the Environmental Protection Act 1990 [5], Section 34, which can be downloaded from: http://archive.defra.gov.uk/environment/waste/controls/documents/waste-man-duty-code.pdf.*

2.10 energy recovery

activity to use combustible waste as a means to generate energy through direct incineration with recovery of heat
[BS EN 13965-2:2010, **3.21**]

2.11 environment

surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation
[BS EN ISO 14001:2004, **3.5**]

NOTE *Surroundings in this context extend from within an organization to the global system.*

2.12 hazardous waste

waste which displays one or more hazardous properties
[European Communities Directive 2008/98/EC on waste [4], Article 3(2)]

NOTE *A list of hazardous properties is given in European Communities Directive 2008/98/EC on waste [4], Annex III.*

2.13 household waste

waste from domestic property, a caravan, a residential home, premises forming part of a university or school or other educational establishment and premises forming part of a hospital or nursing home
[Environmental Protection Act 1990 [5], abbreviation of Section 75(5)]

NOTE *A detailed description of which wastes are classified as household waste is given in The Controlled Waste (England and Wales) Regulations 2012 [6] and The Controlled Waste (Amendment) Regulations (Northern Ireland) 2003 [7].*

2.14 improvement action

action to reduce the probability of a potential nonconformity occurring

NOTE *Information regarding the continual improvement of a quality management system can be found in BS EN ISO 9000:2005, **2.9**.*

2.15 incident

situation that might be, or could lead to, a business disruption, loss, emergency or crisis
[BS 25999-1:2006, **2.6**]

2.16 industrial waste

waste from any factory and from any premises used for the purposes of, or in connection with, the provision of transport services, the supply of gas, water or electricity, sewerage services or postal or telecommunications services
[Environmental Protection Act 1990 [5], abbreviation of Section 75(6)]

NOTE *A detailed description of which wastes are classified as industrial waste is given in The Controlled Waste (England and Wales) Regulations 2012 [6] and The Controlled Waste (Amendment) Regulations (Northern Ireland) 2003 [7].*

2.17 landfill

waste disposal site for the deposit of waste onto or into land
[European Communities Council Directive 1999/31/EC on the landfill of waste [8], abbreviation of Article 2(g)]

2.18 landfill diversion rate

mass of waste diverted from landfill as a proportion of the total mass of waste received

2.19 mass

quantitative measure of an object's resistance to being accelerated

NOTE *In everyday usage, mass is commonly confused with weight. However, weight is the strength of the gravitational pull on an object and hence, it is a force, measured in newtons. This difference between mass and weight is consistent with the rules described by the International System of Units (SI) and specified in BS ISO 80000.*

2.20 material recovery rate

mass of waste recovered by material type as a proportion of the total mass of the same material received as waste

2.21 maximum capacity of operation

maximum mass of waste that can be processed by a waste resource management organization over a specified period of time

NOTE *Values can be given in units of, for example, kilograms per day, tonnes per year and litres per week.*

2.22 organization

company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration
[BS EN ISO 14001:2004, **3.16**]

NOTE *For organizations with more than one operating unit, a single operating unit may be defined as an organization.*

2.23 preventive action

action to eliminate the cause of a potential nonconformity
[BS EN ISO 14001:2004, **3.17**]

2.24 recovery

operation, the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy
[European Communities Directive 2008/98/EC on waste [4], Article 3(15)]

NOTE *Recovery includes, for example, reuse, recycling and energy recovery. A list of waste operations that may lead to recovery is given in European Communities Directive 2008/98/EC on waste [4], Annex II.*

2.25 recycling

recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes, excluding energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations
[European Communities Directive 2008/98/EC on waste [4], Article 3(17)]

2.26 reuse

recovery operation by which products or components that are not waste are used again for the same purpose for which they were conceived
[European Communities Directive 2008/98/EC on waste [4], Article 3(13)]

2.27 top management

person or group of people who directs and controls an organization at the highest level
[BS EN ISO 9000:2005, **3.2.7**]

2.28 transfer

process of moving waste from one location to another

2.29 transfer station

site where waste is transferred from one means of transport to another
[BS EN 13965-2:2010, **3.51**, modified]

NOTE *Mostly, the waste is transferred from smaller transport units to larger ones.*

2.30 treatment

recovery or disposal operations, including preparation prior to recovery or disposal
[European Communities Directive 2008/98/EC on waste [4], Article 3(14)]

2.31 treatment facility

facility where waste is treated for recovery or disposal

2.32 visual inspection

examination by sight of a material or product for its composition and quantity

2.33 waste

substance or object which the holder discards, intends to discard or is required to discard
[European Communities Directive 2008/98/EC on waste [4], Article 3(1)]

2.34 waste broker

organization that arranges, on behalf of others, the transport, disposal or recovery of controlled waste but does not hold or handle it themselves

NOTE *For example, they may arrange for it to be recovered or disposed of by other organizations.*

2.35 waste carrier

organization that transports controlled waste to or from any place in the course of any business or otherwise with a view to profit

2.36 waste characterization

analysis of the composition of waste to determine if it is inert, non hazardous or hazardous, or contains components that would cause it to be included in the relevant category

2.37 waste hierarchy

priority order of waste prevention and management strategies

NOTE *The waste hierarchy is given in the European Communities Directive 2008/98/EC on waste [4], Article 4 as:*

a) prevention;

b) preparing for reuse;

c) recycling;

d) other recovery (e.g. energy recovery); and

e) disposal.

2.38 waste operation

activity conducted in the collection, transport, recovery, treatment and disposal of waste

2.39 waste resource management

collection, transport, recovery, treatment and disposal of waste, including the supervision of such operations and aftercare of disposal sites
[European Communities Directive 2008/98/EC on waste [4], definition of waste management in Article 3(9)]

2.40 waste resource management organization

organization that conducts waste operations

3 General

3.1 The organization shall produce a publicly available annual report that contains the information specified in Clause **4** to Clause **11**.

3.2 The report shall be approved in writing by top management.

NOTE 1 *The presentation of the report is not prescribed. Flow diagrams, charts or drawings may be used when describing an organization's operations and processes.*

NOTE 2 *Detailed guidance on how to complete a waste resource management report conforming to PAS 402 is given in a supporting document published by CEW entitled,* Waste Resource Management – Guidance for Performance Reporting Against PAS 402 *[3].*

4 Scope of operations

The report shall define the scope of the organization's waste operations that are to be included within the report, including:

a) all environmental permit numbers and/or waste management licence numbers;

b) the organization's name, or names, as detailed on its environmental permits and/or waste management licences;

c) any permitted waste operations;

NOTE 1 *Where the permitted waste operations are covered by a standard rules permit, details may be provided by the addition of a web link reference to the standard permit or by appending a copy of the permit to the report. Where the permitted waste operations are of a bespoke nature, a copy of the permit should be appended.*

d) any exempt waste operations;

NOTE 2 *Details of registered (where applicable) exempt waste operations may be provided by listing the appropriate waste operation exemption certificate.*

e) planning permission numbers relevant to the waste operations referred to in c) and d);

f) a description of all locations where the waste operations identified in c), d) and e) are undertaken, including those locations under the organization's direct control and those locations owned by third parties;

g) the maximum capacity of operation for each of the operations identified in c), d) and e);

NOTE 3 *Values can be given in units of, for example, kilograms per day, tonnes per year and litres per week.*

h) a justification for any exclusions from the scope of the report.

NOTE 4 *The identification of a waste resource management organization's permitted and exempt waste operations is covered by the Environmental Permitting (England and Wales) (Amendment) Regulations 2012 [9], the Waste Management Licensing (Amendment) Regulations (Northern Ireland) 2011 [10] and the Waste Management Licensing (Scotland) Regulations 2011 [11].*

5 Client relationship

The report shall describe how the organization identifies the requirements of its clients and how they propose to meet those requirements.

NOTE 1 *It is essential for the organization to determine what a client requires. By knowing what is required of them, the organization can deliver its services and/or its products effectively. How these requirements are determined will be down to the organization. Through knowing the customer requirements the organization can plan for the future.*

NOTE 2 *The organization can advise the client about how they can help them meet their legal obligations with respect to waste and how their services support the waste hierarchy.*

6 Impacts and risks

6.1 The report shall:

a) describe how the organization identifies, records, assesses and controls the impacts and risks associated with its waste operations, including, as a minimum, risks associated with the environment, health and safety and a failure to meet quality criteria; and

b) demonstrate that the level of control is proportional to the expected level of impact and risk.

NOTE *The assessment of impacts and risks may be conducted against work instructions and/or method statements via internal and/or external audits.*

6.2 The report shall describe how the organization addresses unplanned incidents and maintains business continuity.

NOTE 1 *This could be achieved, for example, by an emergency response plan and a business contingency plan. These should be proportional to the effect of the potential impacts and risks.*

NOTE 2 *A business contingency plan should address, as a minimum, potential losses in processing capacity resulting from, for example:*

- *extreme weather;*
- *major accidents;*
- *spillages;*
- *fire;*
- *vandalism;*
- *market failure;*
- *loss of technical competence;*
- *insurance provision; and*
- *waste materials outside the terms of an environmental permit or a waste management licence.*

7 Operational management

The report shall describe the processes that the organization has in place for the management and implementation of its waste operations, including:

a) how the organization defines the roles and responsibilities it needs to conduct its business;

b) how the organization maintains control of waste within the organization's custody;

NOTE 1 Examples of waste processing activities for which an organization is likely to describe procedures are given in Annex B.

NOTE 2 Detailed guidance on duty of care in waste management is available for each country in the UK from Defra [1], Department of the Environment (Northern Ireland) [2], the Scottish Government [3] and the Welsh Government [4].

c) how the organization identifies the operational resources it needs to conduct its business and how it maintains control of these operational resources;

NOTE 3 Resources and information are essential for the effective operation of an organization. Details should be provided of the resource commitment made to ensure effective operation of the organization. Resources can be financial, time and/or information and will vary in accordance with the nature and scale of the organization.

NOTE 4 It is possible to manage resources by regular (e.g. daily, weekly, monthly and/or annual) reviews of order books, enquiries, input and output figures, transport, labour, plant, storage capacities, markets and costs, for example.

d) how the organization ensures its waste operations remain within the maximum capacity of operation for each of the permitted waste operations as identified in Clause **4**c), or any exempt waste operations as identified in Clause **4**d);

e) where there is more than one transfer of waste, what steps are taken to prevent information on waste (e.g. type and mass) being lost or inaccurately reproduced; and

f) how the organization controls the waste it generates.

[1] Further information regarding Defra can be found on the website: http://www.defra.gov.uk.

[2] Further information regarding the Department of the Environment (Northern Ireland): http://www.doeni.gov.uk.

[3] Further information regarding the Scottish Government can be found on the website: http://home.scotland.gov.uk.

[4] Further information regarding the Welsh Government can be found on the website: http://wales.gov.uk.

8 Competence

The report shall describe how the organization assesses, reviews, maintains and records the competence of all people working on behalf of the organization, including details of their knowledge, skills and experience for the tasks assigned to them.

NOTE 1 The organization should:

a) determine what tasks are key to its performance;

b) identify the knowledge, awareness, understanding and skills needed to perform these tasks;

c) assign these tasks to people working on behalf of the organization and notify them of their roles and responsibilities in performing these tasks;

d) demonstrate the ability of persons performing these tasks to meet or exceed the detailed task requirements, for example, by maintaining training records and details of qualifications achieved;

e) provide training where persons do not meet the detailed task requirements; and

f) review the need for additional training in response to changes in legislation, regulations, organizational structure, role requirements, plant and process operations.

NOTE 2 Attention is drawn to the existence of legal requirements for the technical competence of waste operators in England, Northern Ireland, Scotland and Wales.

9 Legal and other requirements

The report shall demonstrate how the organization evaluates and achieves compliance with its legal and other requirements.

NOTE 1 It is the responsibility of the organization to identify applicable legal requirements and other applicable requirements and determine how it will evaluate compliance with them.

NOTE 2 If the organization identifies areas of nonconformance to legal requirements or other requirements to which it subscribes, the organization should detail how it resolved the nonconformance.

10 Corrective actions, preventive actions and improvement actions

The report shall detail the processes the organization has in place for identifying and recording the need for corrective actions, preventive actions and improvement actions.

NOTE 1 *The organization should undertake a review providing comment on the suitability, adequacy and effectiveness of the actions.*

NOTE 2 *The plan-do-check-act cycle used in existing management system standards offers a recognized methodology for managing corrective, preventive and improvement actions. Corresponding clauses and subclauses in these standards are given in Annex A.*

11 Performance review

11.1 The report shall describe the performance of the organization, including:

a) any improvement actions and plans;

NOTE 1 *Existing management system standards provide a recognized framework for the development and maintenance of improvement actions and plans. Corresponding clauses and subclauses in these standards are given in Annex A.*

b) throughput of waste in tonnes over the entire period of four consecutive quarters reported against in accordance with **11.2**a);

c) landfill diversion rates (excluding asbestos) determined in accordance with Annex C; and

d) material recovery rates (excluding asbestos) determined in accordance with Annex C.

NOTE 2 *Asbestos has been excluded from c) and d) because there are no alternatives to sending this material to landfill at the time of publication.*

11.2 The report shall record landfill diversion and material recovery rates for a) and b), as follows:

a) per quarter for four consecutive quarters; these are:

1) 1 January to 31 March;
2) 1 April to 30 June;
3) 1 July to 30 September;
4) 1 October to 31 December; and

b) as a percentage, to the nearest whole number.

NOTE *The report may commence from the start of any of the periods given in 1), 2), 3) or 4), as long as landfill diversion and material recovery rates are reported for four consecutive quarters.*

11.3 The report shall record the mass, in tonnes, of:

a) end of waste material;

NOTE *See Annex B, j), Note, for further information regarding methods for determining the end of waste.*

b) material transferred for recovery; and

c) material transferred for disposal.

11.4 The report shall record the mass in tonnes by material type of any stockpiles of processed or unprocessed waste held by the organization. These masses shall be determined at the start and at the end of the period of four consecutive quarters reported against in accordance with **11.2**a).

Annex A (informative)
Correspondence with existing management systems

Organizations that operate management systems conforming to existing management system standards may use their conformity to these standards to demonstrate performance against Clause **3** to Clause **11**.

Broad correspondences between PAS 402:2013 and:

a) BS EN ISO 9001:2008 is given in Table A.1;
b) BS EN ISO 14001:2004 is given in Table A.2;
c) BS OHSAS 18001:2007 is given in Table A.3; and
d) PAS 99:2012 is given in Table A.4.

A direct correspondence between the subclauses of the standards has only been established if the subclauses are largely congruent in requirements. Beyond that, many detailed crossconnections of minor relevance exist which might not be shown.

Table A.1 – Correspondence between PAS 402:2013 and BS EN ISO 9001:2008

PAS 402:2013	BS EN ISO 9001:2008
3 General	**4.1** General requirements
4 Scope of operations	**4.1** General requirements
5 Client relationship	**5.2** Customer focus
	5.4.2 Quality management system planning
	7.2 Customer related processes
6 Impacts and risks	—

Table A.1 – Correspondence between PAS 402:2013 and BS EN ISO 9001:2008 *(continued)*

PAS 402:2013	BS EN ISO 9001:2008
7 Operational management	**6** Resource management
	7.1 Planning of product realization
	7.2.1 Determination of requirements related to the product
	7.2.2 Review of requirements related to the product
	7.3.1 Design and development planning
	7.3.2 Design and development inputs
	7.3.3 Design and development outputs
	7.3.4 Design and development review
	7.3.5 Design and development verification
	7.3.6 Design and development validation
	7.3.7 Control of design and development changes
	7.4.1 Purchasing process
	7.4.2 Purchasing of information
	7.4.3 Verification of purchased product
	7.5.1 Control of production and service provision
	7.5.2 Validation of processes for production and service provision
	7.5.3 Identification and traceability
	7.5.4 Customer property
	7.5.5 Preservation of product
	8.2.3 Monitoring and measurement of processes
	8.2.4 Monitoring and measurement of product
	8.3 Control of nonconforming product
8 Competence	**6.2** Human resources
9 Legal and other requirements	**5.2** Customer focus
	7.2.1 Determination of requirements related to the product
10 Corrective actions, preventive actions and improvement actions	**8.5.1** Continual improvement
	8.5.2 Corrective action
	8.5.3 Preventive action
11 Performance review	**7.6** Control of monitoring and measuring devices
	8.2.1 Customer satisfaction
	8.2.2 Internal audit
	8.2.3 Monitoring and measuring of processes
	8.2.4 Monitoring and measurement of product
	8.4 Analysis of data

Table A.2 – Correspondence between PAS 402:2013 and BS EN ISO 14001:2004

PAS 402:2013		BS EN ISO 14001:2004	
3	General	**4.1**	General requirements
		4.2	Environmental policy
4	Scope of operations	**4.1**	General requirements
		4.2	Environmental policy
5	Client relationship	**4.3.1**	Environmental aspects
		4.4.3	Communication
6	Impacts and risks	**4.3.1**	Environmental aspects
7	Operational management	**4.4.1**	Resources, roles, responsibility and authority
		4.4.6	Operational control
8	Competence	**4.4.2**	Competence, training and awareness
9	Legal and other requirements	**4.3.2**	Legal and other requirements
		4.5.2	Evaluation of compliance
10	Corrective actions, preventive actions and improvement actions	**4.5.3**	Nonconformity, corrective action and preventive action
11	Performance review	**4.3.3**	Objectives, targets and programme(s)
		4.5.1	Monitoring and measurement

Table A.3 – Correspondence between PAS 402:2013 and BS OHSAS 18001:2007

PAS 402:2013		BS OHSAS 18001:2007	
3	General	**4.1**	General requirements
		4.2	OH&S policy
4	Scope of operations	**4.1**	General requirements
		4.2	OH&S policy
5	Client relationship	**4.3.1**	Hazard identification, risk assessment and determining controls
6	Impacts and risks	**4.3.1**	Hazard identification, risk assessment and determining controls
7	Operational management	**4.4.1**	Resources, roles, responsibility and authority
		4.4.6	Operational control
8	Competence	**4.4.2**	Competence, training and awareness
9	Legal and other requirements	**4.3.2**	Legal and other requirements
10	Corrective actions, preventive actions and improvement actions	**4.5.3**	Incident investigation, corrective action and preventive action
11	Performance review	**4.3.3**	Objectives and programme(s)

Table A.4 – Correspondence between PAS 402:2013 and PAS 99:2012

PAS 402:2013	PAS 99:2012	
3 General	**4**	Context of the organization
	9.3	Management review
4 Scope of operations	**4.3**	Determining the scope of the integrated management system
5 Client relationship	**4.2**	Understanding the needs and expectations of interested parties
	7.4	Communication
6 Impacts and risks	**6.1**	Actions to address risks and opportunities
	8.1	Operational planning and control
	9.2	Internal audit
	10.1	Non-conformity and corrective action
7 Operational management	**7.1**	Resources
	8	Operation
8 Competence	**5.3**	Organizational roles, responsibilities and authorities
	7.2	Competence
9 Legal and other requirements	**4.1**	Understanding the organization and its context
	6.2	IMS objectives and planning to achieve them
	9	Performance evaluation
10 Corrective, preventive and improvement actions	**4.5.4**	Handling of nonconformities
	4.6.2	Corrective, preventive and improvement action
11 Performance review	**9**	Performance evaluation

Annex B (informative)
Waste processing activities

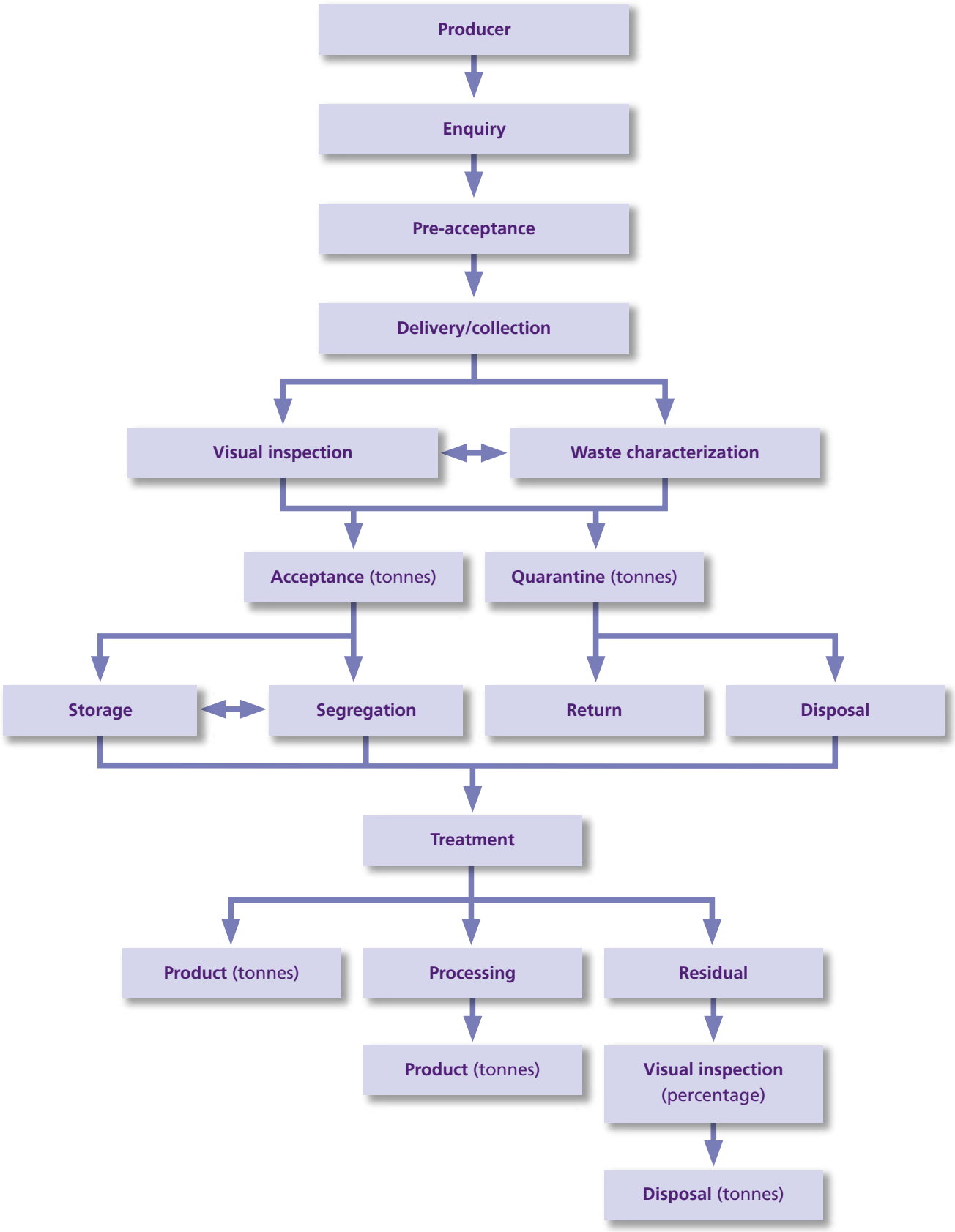
Examples of waste processing activities for which an organization is likely to describe procedures include:

a) transportation, e.g. for securing the load and to minimize impacts en route such as via the control of noise, vibration, dust, mud, odours and fumes;
b) collection;
c) acceptance, including:
    1) whether the waste is allowed by the licence/permit/exemption;
    2) determining and costing the method or defined treatment and disposal route before acceptance;
    3) whether there is sufficient capacity available on site for the waste to be accommodated;
d) visual inspection and/or waste characterization;
e) identification of materials for the preparation of reuse (before the processing of waste begins and the opportunities for reuse diminish);
f) segregation, including via a picking line and mechanical sorting;
g) storage, including:
    1) checking that wastes are deposited within an area where there is capacity for it;
    2) checking that precautions are taken to prevent mixing, escape and leaching and to minimize the risk of fire;
h) prevention of escape;
i) quarantine, including:
    1) criteria for the acceptance and rejection of wastes, together with a process for tracking and reporting rejected wastes;
    2) providing notification to the customer or the waste's producer and the Environment Agency, Natural Resources Wales, the Northern Ireland Environmental Agency (NIEA) and/or the Scottish Environment Protection Agency (SEPA);
j) waste processing in accordance with the methods for the determination of end of waste (see note) for the production of recovered materials, including:
    1) treatment by:
        i) baling;
        ii) crushing;
        iii) composting;
        iv) recycling;
        v) re-processing;
        vi) screening;
        vii) shredding; and
        viii) treatment prior to landfill;
    2) transfer for off-site processing;
    3) energy recovery;
    4) disposal, including to landfill;

    NOTE *End of waste can normally be determined via one of the following three methods: compliance with end of waste regulations; meeting a quality protocol; or through an end of waste submission. Further information regarding end of waste can be obtained from the Environment Agency (http://www.environment-agency.gov.uk/business/sectors/124299.aspx).*
k) site security (see BS 8220-3);
l) working with contractors;
m) working with waste resource management organizations; and
n) documentation and recording systems, including certificates of destruction.

A flow chart showing the relationship between these activities is given in Figure B.1.

Figure B1 – Typical waste processing activities



Annex C (normative)
Method for determining landfill diversion and material recovery rates

C.1 General

C.1.1 All waste containers received and leaving a site shall be measured using a calibrated weighing machine.

NOTE *Attention is drawn to the Weights and Measures Act 1985 [12], and the Weights and Measures (Amendment) Act (Northern Ireland) 2000 [13], which includes requirements relating to weighing or measuring equipment for use for trade. Further information regarding calibrated weighing machines can be found from the National Physics Laboratory [5] or organizations such as UKAS [6].*

C.1.2 All masses shall be recorded in tonnes.

C.1.3 All rates shall be recorded as percentages.

C.2 Measurements

The measurements in Table C.1 shall be determined in accordance with the measurement method also specified in Table C.1.

NOTE *The measurements used for determining landfill diversion and material recovery rates are represented in Figure C.1.*

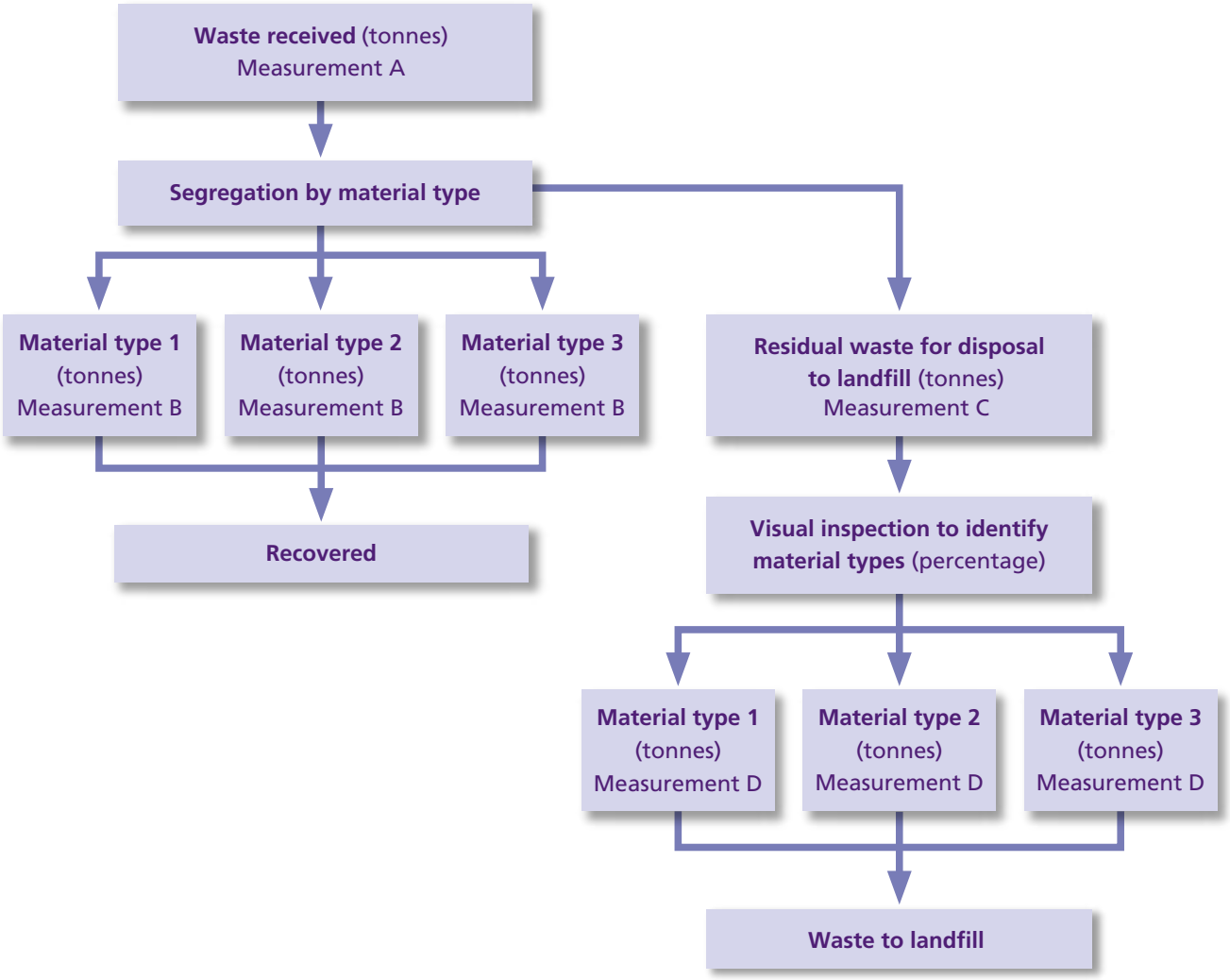
Table C.1 – Measurements for determining landfill diversion and material recovery rates

Measurement	Description	Units	Measurement method
A	Mass of waste received by the organization (excluding asbestos)	tonnes	Calibrated weighing machine
B	Mass of waste recovered by material type (excluding asbestos)	tonnes	Calibrated weighing machine Material type classified by European Waste Catalogue codes given in Table C.2
C	Mass of waste sent to landfill by the organization (excluding asbestos)	tonnes	Calibrated weighing machine
D	Mass of waste sent to landfill by the organization by material type (excluding asbestos)	tonnes	See **C.3**

[5] See the NPL code of practice for the calibration of industrial process weighing systems online: http://resource.npl.co.uk/docs/science_technology/mass_force_pressure/clubs_groups/instmc_weighing_panel/wgc0496.pdf [14].

[6] See the UKAS document, LAB 14, for the calibration of weighing machines online: http://www.ukas.com/library/Technical-Information/Pubs-Technical-Articles/Pubs-List/LAB14.pdf [15].

Figure C.1 – Measurements for determining landfill diversion and material recovery rates



C.3 Mass of waste to landfill by material type

C.3.1 Visual inspection shall be undertaken:

a) for all containers at the point of acceptance or for all containers transporting waste to landfill;

b) to establish the composition of the container contents by material type using the European Waste Catalogue codes given in Table C.2; and

c) to estimate what percentage of the total volume of the container is occupied by each material type identified in b).

NOTE An example form that can be used as an aid to visual inspection is given in Figure C.2.

C.3.2 The volume of each container shall be recorded in cubic metres.

NOTE Volumes for typical containers types and sizes can be converted into cubic metres using Table C.3.

C.3.3 The volume for each type of material in a container shall be determined from the percentage value estimated in **C.3.1**c).

Example

Volume of container = 15.3 m^3

Volume of soil in a waste container = 60%

Volume of soil = (15.3/100) × 60 = 9.18 m^3

C.3.4 The mass of each material type in a container shall be calculated using the associated density factor in Table C.2.

Example

Volume of soil = 9.18 m^3

Conversion factor in Table C.2 for soil (EWC code 17 05 04) = 1.25

Mass of soil = 9.18 × 1.25 = 11.48 tonnes

C.4 Landfill diversion rate

The percentage landfill diversion rate shall be calculated using Equation C.1.

$$\text{Landfill diversion rate (\%)} = \left[\frac{\text{Waste received (A)} - \text{Waste to landfill (C)}}{\text{Waste received (A)}}\right] \times 100$$

Equation C.1

C.5 Material recovery rate

C.5.1 The percentage material recovery rate shall be calculated for each type of material recovered using Equation C.2.

$$\text{Material recovery rate (\%)} = \left[\frac{\text{Waste recovered by material type (B)}}{\text{Waste recovered by material type (B)} + \text{Waste to landfill by material type (D)}}\right] \times 100$$

Equation C.2

C.5.2 If there is no recovery for a given material type, the material recovery rate shall be recorded as 0.

Table C.2 – Density factors by European Waste Catalogue (EWC) code

EWC code [16]	Description	Density factor [17] tm^{-3}
13	**Oil wastes and waste liquid fuels (except edible oils, and those listed in 05, 12, and 19)**	
13 01	**Waste hydraulic oils**	
13 01 10*	Mineral based non-chlorinated hydraulic oils	0.90
13 02	**Waste engine, gear and lubricating oils**	
13 02 04*	Mineral-based chlorinated engine, gear and lubricating oils	0.90
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	0.90
13 02 08*	Other engine, gear and lubricating oils	0.90
13 08	**Oil wastes not otherwise specified**	
13 08 99*	Wastes not otherwise specified	0.19
14	**Waste organic solvents, refrigerants and propellants (except 07 and 08)**	
14 06	**Waste organic solvents, refrigerants and foam/aerosol propellants**	
14 06 01*	Chlorofluorocarbons, hcfc, hfc	0.00
15	**Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified**	
15 01	**Packaging (including separately collected municipal packaging waste)**	
15 01 01	Paper and cardboard packaging	0.20
15 01 02	Plastic packaging	0.22
15 01 03	Wooden packaging	0.23
15 01 04	Metallic packaging	0.22
15 01 05	Composite packaging	0.20
15 01 06	Mixed packaging	0.21
15 01 07	Glass packaging	0.33
15 01 09	Textile packaging	0.18
15 01 10*	Packaging containing residues of or contaminated by dangerous substances	0.21
15 01 11*	Metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers	0.17
15 02	**Absorbents, filter materials, wiping cloths and protective clothing**	
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	0.42
15 02 03	Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	0.07

NOTE *Any waste marked in the list with an asterisk (*) is considered to be hazardous waste.*

Table C.2 – Density factors by European Waste Catalogue (EWC) code *(continued)*

EWC code [16]	Description	Density factor [17] tm^{-3}
16	Wastes not otherwise specified in the list	
16 01	**End of life vehicles from different means of transport (including off-road machinery) and waste from dismantling of end of life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**	
16 01 03	End-of life tyres	0.47
16 01 07*	Oil filters	0.19
16 01 15	Antifreeze fluids other than those mentioned in 16 01 14	0.90
16 01 17	Ferrous metal	0.30
16 02	**Wastes from electrical and electronic equipment**	
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	0.26
16 02 14	Discarded equipment other than those mentioned in 16 02 09 to 16 02 13	0.26
16 02 16	Components removed from discarded equipment other those mentioned in 16 02 15	0.30
16 05	**Gases in pressure containers and discarded chemicals**	
16 05 05	Gases in pressure containers other than those mentioned in 16 05 04	0.30
16 06	**Batteries and accumulators**	
16 06 01*	Lead batteries	1.35
16 07	**Wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)**	
16 07 08*	Wastes containing oil	0.19
16 10	**Aqueous liquid wastes destined for off-site treatment**	
16 10 01*	Aqueous liquid wastes containing dangerous substances	0.90
17	Construction and demolition wastes (including excavated soil from contaminated sites)	
17 01	**Concrete, bricks, tiles and ceramics**	
17 01 01	Concrete	1.27
17 01 02	Bricks	1.20
17 01 03	Tiles and ceramics	0.59
17 01 06*	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances	1.17
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	1.24
17 02	**Wood, glass and plastic**	
17 02 01	Wood	0.34
17 02 02	Glass	0.61
17 02 03	Plastic	0.23
17 02 04*	Glass, plastic and wood contaminated with dangerous substances	0.29

NOTE *Any waste marked in the list with an asterisk (*) is considered to be hazardous waste.*

Table C.2 – Density factors by European Waste Catalogue (EWC) code *(continued)*

EWC code [16]	Description	Density factor [17] tm^{-3}
17 03	**Bituminous mixtures, coal tar and tarred products**	
17 03 01*	Bituminous mixtures containing coal tar	0.90
17 03 02	Bituminous mixtures other than those mentioned in 17 03 01	0.82
17 03 03*	Coal tar and tarred products	1.95
17 04	**Metals (including their alloys)**	
17 04 01	Copper	0.90
17 04 02	Aluminium	0.20
17 04 03	Lead	0.91
17 04 04	Zinc	0.43
17 04 05	Iron/steel	0.41
17 04 06	Tin	0.90
17 04 07	Mixed metals	0.42
17 04 09*	Metal waste contaminated with dangerous substances	0.46
17 04 10*	Cables containing oil, coal tar and other dangerous substances	0.25
17 04 11	Cables other than those mentioned in 17 04 10	0.25
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**	
17 05 03*	Soil and stones containing dangerous substances	1.25
17 05 04	Soil and stones other than those mentioned in 17 05 03	1.25
17 05 05*	Dredging spoil containing dangerous substances	0.51
17 05 06	Dredging spoil other than those mentioned in 17 05 05	0.51
17 05 07*	Track ballast containing dangerous substances	1.09
17 05 08	Track ballast other than those mentioned in 17 05 07	1.09
17 06	**Insulation materials and asbestos-containing construction materials**	
17 06 01*	Insulation materials containing asbestos	0.28
17 06 03*	Other insulation materials consisting of or containing dangerous substances	0.20
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03	0.25
17 06 05*	Construction materials containing asbestos	0.31
17 08	**Gypsum-based construction materials**	
17 08 01*	Gypsum-based construction materials contaminated with dangerous substances	0.33
17 08 02	Gypsum-based construction materials other than those mentioned in 17 08 01	0.33

NOTE *Any waste marked in the list with an asterisk (*) is considered to be hazardous waste.*

Table C.2 – Density factors by European Waste Catalogue (EWC) code *(continued)*

EWC code [16]	Description	Density factor [17] tm^{-3}
17 09	**Other construction and demolition wastes**	
17 09 01*	Construction and demolition wastes containing mercury	0.87
17 09 02*	Construction and demolition wastes containing pcb (for example pcb-containing resin-based floorings, pcb-containing sealed glazing units, pcb-containing capacitors)	
17 09 03*	Other construction and demolition wastes (including mixed wastes) containing dangerous substances	0.87
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	0.87
18	**Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)**	
18 01	**Wastes from natal care, diagnosis, treatment or prevention of disease in humans**	
18 01 04	Wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)	0.21
19	**Wastes from waste management facilities, off-site waste water treatment facilities and the preparation of water intended for human consumption and water for industrial use**	
19 13	**Wastes from soil and groundwater remediation**	
19 13 01*	Solid wastes from soil remediation containing dangerous substances	1.17
20	**Municipal wastes (household wastes and similar commercial, industrial and institutional wastes) including separately collected fractions**	
20 01	**Separately collected fractions (except 15 01)**	
20 01 01	Paper and cardboard	0.21
20 01 08	Biodegradable kitchen and canteen waste	0.20
20 01 10	Clothes	0.20
20 01 11	Textiles	0.27
20 01 13*	Solvents	0.81
20 01 19*	Pesticides	0.90
20 01 21*	Fluorescent tubes and other mercury-containing waste	0.19
20 01 23*	Discarded equipment containing chlorofluorocarbons	0.30
20 01 26*	Oil and fat other than those mentioned in 20 01 25	0.57
20 01 27*	Paints, inks, adhesives and resins containing dangerous substances	0.57
20 01 28	Paint, inks, adhesives and resins other than those mentioned in 20 01 27	0.57
20 01 30	Detergents other than those mentioned in 20 01 29	0.90
20 01 33*	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	1.35
20 01 34	Batteries and accumulators other than those mentioned in 20 01 33	1.35

NOTE *Any waste marked in the list with an asterisk (*) is considered to be hazardous waste.*

Table C.2 – Density factors by European Waste Catalogue (EWC) code *(continued)*

EWC code [16]	Description	Density factor [17] tm^{-3}
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	0.25
20 01 39	Plastic	0.23
20 01 40	Metals	0.42
20 02	**Garden and park wastes (including cemetery wastes)**	
20 02 01	Biodegradable waste	0.38
20 03	**Other municipal wastes**	
20 03 01	Mixed municipal waste	0.21
20 03 03	Street-cleaning residues	0.47
20 03 04	Septic tank sludge	0.92
20 03 06	Waste from sewage cleaning	0.92
20 03 07	Bulky waste	0.18

NOTE *Any waste marked in the list with an asterisk (*) is considered to be hazardous waste.*

Figure C.2 – Visual inspection form

Container reference		**Date**	
Container type		**Container volume**	**Container mass**

Compaction

Tick one or, if other, insert value

Type		**Type**	
Uncompacted (40% void)		Machine compacted (5% void)	
Slightly compacted (25% void)		Other (insert value)	

Composition

EWC code	**Description**	**% volume** Increments of 5%
15 01 01	Paper	
15 01 01	Cardboard	
15 01 03	Wooden	
15 01 04	Metallic	
15 01 05	Composite	
15 01 07	Glass	
16 02 16	Electrical and electronic equipment	
17 01 01	Concrete	
17 01 02	Bricks	
17 01 03	Tile and ceramics	
17 02 03	Plastic	
17 04 07	Mixed metals	
17 05 04	Soils and stones	
17 06 04	Insulation	
20 01 11	Textiles	
20 02 01	Biodegradable waste	
20 03 07	Furniture	

Table C.3 – Conversion table for typical waste container sizes

Container	Volume (imperial)	Volume (metric)	Dimension
Plastic bag	30 l	0.03 m^3	—
	60 l	0.06 m^3	—
Wheeled bin	240 l	0.24 m^3	L 0.75 m W 0.60 m H 1.00 m
	360 l	0.36 m^3	L 0.90 m W 0.60 m H 1.00 m
	660 l	0.66 m^3	L 0.80 m W 1.40 m H 1.20 m
	1 100 l	1.1 m^3	L 1.40 m W 1.00 m H 1.50 m
Front end loader	4 cubic yards	3.1 m^3	L 1.45 m W 1.80 m H 1.50 m
	6 cubic yards	4.6 m^3	L 1.70 m W 1.80 m H 1.70 m
	8 cubic yards	6.1 m^3	L 1.80 m W 1.80 m H 1.80 m
	10 cubic yards	7.6 m^3	L 2.20 m W 2.00 m H 2.20 m
Skip	6 cubic yards	4.6 m^3	L 3.50 m W 1.80 m H 1.00 m
	8 cubic yards	6.1 m^3	L 3.70 m W 1.80 m H 1.25 m
	12 cubic yards	9.2 m^3	L 4.00 m W 1.80 m H 1.80 m
	14 cubic yards	10.7 m^3	L 4.50 m W 1.80 m H 1.75 m

Table C.3 – Conversion table for typical waste container sizes *(continued)*

Container	Volume (imperial)	Volume (metric)	Dimension
Rear end loader	6 cubic yards	4.6 m^3	L 2.60 m W 1.80 m H 1.60 m
	8 cubic yards	6.1 m^3	L 3.25 m W 1.80 m H 1.70 m
	10 cubic yards	7.6 m^3	L 3.80 m W 1.80 m H 1.60 m
	12 cubic yards	9.2 m^3	L 3.80 m W 1.80 m H 1.80 m
	14 cubic yards	10.7 m^3	L 4.40 m W 2.00 m H 2.10 m
Roll on/off	15 cubic yards	11.5 m^3	L 5.90 m W 2.40 m H 1.00 m
	20 cubic yards	15.3 m^3	L 3.25 m W 2.40 m H 1.70 m
	25 cubic yards	19.1 m^3	L 6.20 m W 2.40 m H 2.10 m
	40 cubic yards	30.6 m^3	L 6.20 m W 2.40 m H 3.00 m

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