

بيروت في ١٨ آذار ٢٠٢٤

وزير البيئة

د. ناصر ياسين

للاطلاع على مرفقات هذا القرار الدخول على الرابط
التالي: www.Pcm.gov.Lb

قرار رقم ١/٢٥

المعايير والشروط الدنيا المتعلقة بعملية الفرز الميكانيكي

إن وزير البيئة،

بناءً على المرسوم رقم ٨٣٧٦ تاريخ ١٠/١٠/٢٠٢١ (تشكيل الحكومة)،

بناءً على القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (إحداث وزارة البيئة)، لا سيما المادة الأولى منه،

بناءً على القانون رقم ٤٤٤ تاريخ ٢٠٠٢/٧/٢٩ (حماية البيئة)،

بناءً على القانون رقم ٦٩٠ تاريخ ٢٠٠٥/٨/٢٦ (تحديد مهام وزارة البيئة وتنظيمها)،

بناءً على القانون رقم ٨٠ تاريخ ٢٠١٨/١٠/١٠ (قانون الإدارة المتكاملة للنفايات الصلبة)، لا سيما

المادة ٢١ منه،

وبعد استشارة مجلس شورى الدولة (الرأي رقم ٢٠٢١/٩١-٢٠٢٢ تاريخ ٢٠٢٢/٢/٢٢، الرأي رقم ٢٠٢٣/٦١-٢٠٢٤ تاريخ ٢٠٢٤/١/٢٣، الرأي رقم ٢٠٢٣/٨٨-٢٠٢٤ تاريخ ٢٠٢٤/٢/٢٢)،

يقرر ما يأتي:

المادة ١ - تحديد المعايير والشروط الدنيا

تحدد المعايير والشروط الدنيا الواجب التقيد بها بالنسبة لعملية الفرز الميكانيكي وفق أحكام الملحق المرفق.

يتوجب على كل جهة تتولى معالجة النفايات الصلبة البلدية من خلال الفرز الميكانيكي اتخاذ الاجراءات الضرورية لوضع هذه المعايير والشروط الدنيا موضع التنفيذ.

المادة ٢ - الملحق

يعتبر الملحق المرفق بهذا القرار جزءاً لا يتجزأ منه.

المادة ٣ - حق فرض معايير وشروط جديدة
تحتفظ وزارة البيئة بحق فرض معايير وشروط جديدة أو تعديل أي منها عندما تدعو الحاجة.

المادة ٤ - إلغاء القرارات المخالفة

تلغى كافة القرارات المخالفة لأحكام هذا القرار أو

وزارة البيئة

قرار رقم ١/٢٤

المعايير والشروط الدنيا المتعلقة بعملية الجمع والنقل

إن وزير البيئة،

بناءً على المرسوم رقم ٨٣٧٦ تاريخ ١٠/١٠/٢٠٢١ (تشكيل الحكومة)،

بناءً على القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (إحداث وزارة البيئة)، لا سيما المادة الأولى منه،

بناءً على القانون رقم ٤٤٤ تاريخ ٢٠٠٢/٧/٢٩ (حماية البيئة)،

بناءً على القانون رقم ٦٩٠ تاريخ ٢٠٠٥/٨/٢٦ (تحديد مهام وزارة البيئة وتنظيمها)،

بناءً على القانون رقم ٨٠ تاريخ ٢٠١٨/١٠/١٠ (قانون الإدارة المتكاملة للنفايات الصلبة)، لا سيما

المادة ٢٠ منه،

وبعد استشارة مجلس شورى الدولة (الرأي رقم ٢٠٢١/٩١-٢٠٢٢ تاريخ ٢٠٢٢/٢/٢٢، الرأي رقم ٢٠٢٣/٦١-٢٠٢٤ تاريخ ٢٠٢٤/١/٢٣، الرأي رقم ٢٠٢٣/٨٨-٢٠٢٤ تاريخ ٢٠٢٤/٢/٢٢)،

يقرر ما يأتي:

المادة ١ - تحديد المعايير والشروط الدنيا

تحدد المعايير والشروط الدنيا الواجب التقيد بها بالنسبة لعملية الجمع والنقل وفق أحكام الملحق المرفق.

يتوجب على كل جهة تتولى عملية جمع ونقل النفايات الصلبة البلدية اتخاذ الاجراءات الضرورية لوضع هذه المعايير والشروط الدنيا موضع التنفيذ.

المادة ٢ - الملحق

يعتبر الملحق المرفق بهذا القرار جزءاً لا يتجزأ منه.

المادة ٣ - حق فرض معايير وشروط جديدة

تحتفظ وزارة البيئة بحق فرض معايير وشروط جديدة أو تعديل أي منها عندما تدعو الحاجة.

المادة ٤ - إلغاء القرارات المخالفة

تلغى كافة القرارات المخالفة لأحكام هذا القرار أو غير المتفقة مع مضمونه.

المادة ٥ - نشر القرار والعمل به

ينشر هذا القرار ويعمل به فور نشره في الجريدة الرسمية ويبلغ حيث تدعو الحاجة.

غير المتفقة مع مضمونه.

المادة ٥ - نشر القرار والعمل به

ينشر هذا القرار ويعمل به فور نشره في الجريدة الرسمية ويبلغ حيث تدعو الحاجة.

بيروت في ١٨ آذار ٢٠٢٤

وزير البيئة

د. ناصر ياسين

للاطلاع على مرفقات هذا القرار الدخول على الرابط

التالي: www.Pcm.gov.Lb

قرار رقم ١/٢٦

المعايير والشروط الدنيا المتعلقة بعملية

التسبيخ والتفكك البيولوجي

إن وزير البيئة،

بناءً على المرسوم رقم ٨٣٧٦ تاريخ ٢٠٢١/١٠/١٠ (تشكيل الحكومة)،

بناءً على القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (إحداث وزارة البيئة)، لا سيما المادة الأولى منه،

بناءً على القانون رقم ٤٤٤ تاريخ ٢٠٠٢/٧/٢٩ (حماية البيئة)،

بناءً على القانون رقم ٦٩٠ تاريخ ٢٠٠٥/٨/٢٦ (تحديد مهام وزارة البيئة وتنظيمها)،

بناءً على القانون رقم ٨٠ تاريخ ٢٠١٨/١٠/١٠ (قانون الإدارة المتكاملة للنفايات الصلبة)، لا سيما المادة ٢٢ - ب منه،

وبعد استشارة مجلس شورى الدولة (الرأي رقم ٢٠٢١/٩١-٢٠٢٢ تاريخ ٢٠٢٢/٢/٢٢، الرأي رقم ٢٠٢٣/٦١-٢٠٢٤ تاريخ ٢٠٢٤/١/٢٣، الرأي رقم ٢٠٢٣/٨٨-٢٠٢٤ تاريخ ٢٠٢٤/٢/٢٢)،
يقرر ما يأتي:

المادة ١ - تحديد المعايير والشروط الدنيا

تحدد المعايير والشروط الدنيا الواجب التقيد بها بالنسبة لعملية التسبيخ والتفكك البيولوجي وفق أحكام الملحق المرفق.

يتوجب على كل جهة تتولى معالجة النفايات الصلبة البلدية من خلال التسبيخ والتفكك البيولوجي اتخاذ الاجراءات الضرورية لوضع هذه المعايير والشروط الدنيا موضع التنفيذ.

المادة ٢ - الملحق

يعتبر الملحق المرفق بهذا القرار جزءاً لا يتجزأ منه.

المادة ٣ - حق فرض معايير وشروط جديدة

تحتفظ وزارة البيئة بحق فرض معايير وشروط جديدة أو تعديل اي منها عندما تدعو الحاجة.

المادة ٤ - الغاء القرارات المخالفة

تلغى كافة القرارات المخالفة لأحكام هذا القرار أو غير المتفقة مع مضمونه.

المادة ٥ - نشر القرار والعمل به

ينشر هذا القرار ويعمل به فور نشره في الجريدة الرسمية ويبلغ حيث تدعو الحاجة.

بيروت في ١٨ آذار ٢٠٢٤

وزير البيئة

د. ناصر ياسين

للاطلاع على مرفقات هذا القرار الدخول على الرابط

التالي: www.Pcm.gov.Lb

قرار رقم ١/٢٧

المعايير والشروط الدنيا المتعلقة بعملية انتاج

الوقود من النفايات

إن وزير البيئة،

بناءً على المرسوم رقم ٨٣٧٦ تاريخ ٢٠٢١/١٠/١٠ (تشكيل الحكومة)،

بناءً على القانون رقم ٢١٦ تاريخ ١٩٩٣/٤/٢ (إحداث وزارة البيئة)، لا سيما المادة الأولى منه،

بناءً على القانون رقم ٤٤٤ تاريخ ٢٠٠٥/٧/٢٩ (حماية البيئة)،

بناءً على القانون رقم ٦٩٠ تاريخ ٢٠٠٢/٨/٢٦ (تحديد مهام وزارة البيئة وتنظيمها)،

بناءً على القانون رقم ٨٠ تاريخ ٢٠١٨/١٠/١٠ (قانون الإدارة المتكاملة للنفايات الصلبة)، لا سيما المادة ٢٢ - ب منه،

وبعد استشارة مجلس شورى الدولة (الرأي رقم ٢٠٢١/٩١-٢٠٢٢ تاريخ ٢٠٢٢/٢/٢٢، الرأي رقم ٢٠٢٣/٦١-٢٠٢٤ تاريخ ٢٠٢٤/١/٢٣، الرأي رقم ٢٠٢٣/٨٨-٢٠٢٤ تاريخ ٢٠٢٤/٢/٢٢)،
يقرر ما يأتي:

المادة ١ - تحديد المعايير والشروط الدنيا

تحدد المعايير والشروط الدنيا الواجب التقيد بها بالنسبة لعملية انتاج الوقود من النفايات وفق أحكام الملحق المرفق.

بيروت، في

قرار رقم المعايير والشروط الدنيا المتعلقة بعملية الفرز الميكانيكي

إن وزير البيئة،
بناءً على المرسوم رقم 8376 تاريخ 2021/10/10 (تشكيل الحكومة)،
بناءً على القانون رقم 216 تاريخ 1993/4/2 (إحداث وزارة البيئة)، لا سيما المادة الأولى منه،
بناءً على القانون رقم 444 تاريخ 2002/7/29 (حماية البيئة)،
بناءً على القانون رقم 690 تاريخ 2005/8/26 (تحديد مهام وزارة البيئة وتنظيمها)،
بناءً على القانون رقم 80 تاريخ 2018/10/10 (قانون الإدارة المتكاملة للنفايات الصلبة)، لا سيما المادة 21 منه،
وبعد استشارة مجلس شورى الدولة (الرأي رقم 2022-2021/91 تاريخ 2022/2/22، الرأي رقم 2023/61-2023-
2024 تاريخ 2024/1/23، الرأي رقم 2024-2023/88 تاريخ 2024/2/22)،

يقرر ما يلي:

المادة 1 - تحديد المعايير والشروط الدنيا
تحدد المعايير والشروط الدنيا الواجب التقيد بها بالنسبة لعملية الفرز الميكانيكي وفق أحكام الملحق المرفق.
يتوجب على كل جهة تتولى معالجة النفايات الصلبة البلدية من خلال الفرز الميكانيكي اتخاذ الاجراءات
الضرورية لوضع هذه المعايير والشروط الدنيا موضع التنفيذ.

المادة 2 - الملحق
يعتبر الملحق المرفق بهذا القرار جزءاً لا يتجزأ منه.

المادة 3 - حق فرض معايير وشروط جديدة
تحتفظ وزارة البيئة بحق فرض معايير وشروط جديدة أو تعديل أي منها عندما تدعو الحاجة.

المادة 4 - إلغاء القرارات المخالفة
تلغى كافة القرارات المخالفة لأحكام هذا القرار أو غير المتفقة مع مضمونه.

المادة 5 - نشر القرار والعمل به
ينشر هذا القرار ويعمل به فور نشره في الجريدة الرسمية ويبلغ حيث تدعو الحاجة.

وزير البيئة
د. ناصر ياسين

Standards and conditions for the Mechanical sorting process

Table of Contents

1	Scope.....	3
2	Definitions	3
3	General requirements.....	3
3.1	Environmental risk assessment	3
3.2	Planning and Siting Considerations	4
4	Design, Construction and Operational requirements for mechanical sorting facilities.....	4
5	Mechanical Sorting Facility management and requirements.....	4
6	Mechanical Sorting Facility closure, rehabilitation and end-use.....	4
7	ANNEXES	6
	ANNEX 1: ROLE OF MECHANICAL RECYCLING IN SOLID WASTE MANAGEMENT	7
	ANNEX 2: SITE SELECTION & PLANNING FOR MeRFs	11
	ANNEX 3: DESIGN, CONSTRUCTION & OPERATIONAL REQUIREMENTS FOR MeRFs	14
	Design and Construction Requirements for mechanical sorting facilities.....	14
	General	14
	Waste Reception	14
	Supporting infrastructure	15
	Operational requirements for mechanical sorting facilities.....	17
	General Considerations.....	17
	Operational requirements	18
	Environmental monitoring.....	18
	ANNEX 4: MANAGEMENT ASPECTS FOR MeRFs.....	19
	General Regulations.....	19
	Recording and reporting of data.....	19
	Input material	19
	Output material	20
	Records.....	21
	Reports.....	22
	Environmental Management	23
	Personnel	24
	Training	25
	Staffing Levels	25
	Medical.....	25
	Personal Protection Equipment.....	25
	Traffic and Machinery	26
	Scavenging	26
	Security	26
	Fire protection	27
	Emergency procedures	27
	Input acceptance procedure.....	28
	Waste acceptable for reception at the facility.....	28
	Permission for disposal	28
	Non-Conforming Waste Consignments.....	29
	Exclusion of waste suppliers	29
	Reception of Waste in Small Vehicles or Private Cars.....	29

Control of incoming waste	29
Registration	30
Weighing and registration of the waste	30
Rejection of Waste	31
Waste Supplier Departing the Facility.....	31
ANNEX 5: INDICATIVE CONTENTS OF THE ANNUAL REPORT	32

1 Scope

This regulation is to establish minimum standards for facilities where municipal solid waste is processed through mechanical recycling (further called “Mechanical Recycling Facilities” or MeRF).

These guidelines apply to the implementation of MeRF for residential, commercial, and institutional solid wastes. Explicitly excluded are mining, agricultural, and industrial solid wastes; hazardous wastes; sludges; construction and demolition wastes; infectious wastes; classified or special waste. The role of MeRFs in solid waste management and the relevant technologies are described in Annex 1.

2 Definitions

For the implementation of this Decree, additionally, to the definitions of article 1 of Law No 80 “Integrated Solid Waste Management” dated 10 October 2018, the following definitions apply:

1. **Municipal waste:** means waste from households, as well as other waste which, because of its nature or composition, is like household waste.
2. **Household Waste** is defined as waste produced within the curtilage of a building or self-contained part of a building used for living accommodation
3. **Biodegradable waste:** means any waste that can undergo anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.
4. **Recyclable waste:** Materials from the household or similar waste that can be reused as substitutes for the virgin materials in the manufacturing process or they can be used as raw materials to produce different products.
5. **Waste sorting at source** refers to waste sorting at the place of generation according to its nature, type and/or characteristics. Under the condition of separating the waste into at least three categories, preferably four and above. Sorting at source is to be accomplished in two phases: the first phase is at households or non-household units, while the second phase is on the Local Administration level.
6. **Residual Waste** means the fraction of collected waste remaining after a treatment or diversion step, which generally requires further treatment or disposal.

3 General requirements

3.1 Environmental risk assessment

- (1) The siting, design, construction, operation, and closure of a facility of mechanical sorting process must be supported by an assessment of the environmental risk.
- (2) The competent authority must be informed by the environmental risk assessment submitted by a Mechanical Sorting Facility owner/operator during the permitting process. The environmental risk assessment should address both normal, unusual, and unplanned operating conditions. It should cover the entire lifecycle of the Mechanical Sorting facility from initial construction to the point where the Mechanical Sorting facility no longer poses a risk to the environment. The eventual submission of the operational permit should form part of the environmental risk assessment and needs to be explicitly considered at the permitting stage.
- (3) The environmental risk assessment must inform permitting agencies for at least the following issues:
 - (a) Facility siting
 - (b) Protection of soil and water
 - (c) Nuisances and hazards
 - (d) Accidents and emergency response
 - (e) Environmental monitoring system

3.2 Planning and Siting Considerations

- (1) The location of a facility with a mechanical sorting process and the type and amount of waste it is to receive are the primary determinants of the extent to which the facility will pose an environmental risk. Annex 2 presents planning and siting issues for MeRFs.
- (2) Prior to the construction, operation, expansion or modification of a MeRF a permit shall be obtained from MoE. Any entity or person wishing to obtain a permit from the MoE for the construction and/or operation of a MeRF shall submit the following documents:
 - A completed permit Environmental Impact Assessment study.
 - A complete site plan. This plan shall include the following:
 - a. Site conditions and projected use including all site structures, buildings, fences, gates, entrances and exits, parking areas, on-site roadways, and signs.
 - b. Property boundaries, access roads, surface water bodies, wetlands, and the location of flood plain boundaries; and,
 - c. Adjacent properties including the location of public and private water supplies on these properties.
 - d. A plan for training equipment operators and other personnel concerning the operation of the facility;
 - e. A contingency plan describing alternate solid waste handling procedure for inoperable periods or delays in transporting solid waste;
 - f. A closure plan which identifies the steps necessary to close the facility. The plan may be amended at any time during the active life of the facility with the MoE approval. The plan shall be amended whenever changes in operating plans or facility design affect the closure plan.
 - g. A description of the general operating plan for the proposed facility including the origin, composition, and expected weight or volume of all solid waste to be accepted at the facility per day; the maximum time waste will be stored; where all wastes will be disposed; the capacity of the facility; the operating hours of the facility; how non putrescible, recyclable waste will be handled; and, the expected life time of the facility;
 - h. A description of all machinery and equipment to be used, including the design capacity;
 - i. A description of the facility's drainage system and water supply system.

4 Design, Construction and Operational requirements for mechanical sorting facilities

The plans and specifications for a MeRF shall be in compliance with the design criteria as set forth in this regulation. Design, construction and operational requirements for MeRFs are presented in Annex 3.

5 Mechanical Sorting Facility management and requirements

The management of a a MeRF shall be in compliance with the procedures as set forth in this regulation. The requirements for management of MeRFs are presented in Annex 4.

6 Mechanical Sorting Facility closure, rehabilitation and end-use

- (1) A facility to be discontinued, for whatever reasons, must be rehabilitated to the satisfaction of the competent authority.
- (2) Before the closure of a mechanical sorting facility,
 - i. all products must be applied or distributed in accordance with these Standards and Conditions, and

- ii. all unprocessed waste material must be removed from the facility and dealt with in accordance with the relevant regulations and statutes.
- (3) A rehabilitation plan for the site, including the indication of end use of the area must be developed and submitted to the competent authority for approval not more than one (1) year prior to the intended closure of the facility.
- (4) The site must be rehabilitated according to the rehabilitation plan.
- (5) The owner of the facility, including the subsequent owner of the facility will remain responsible for any adverse impacts on the environment, even after operations have ceased.

7 ANNEXES

ANNEX 1: ROLE OF MECHANICAL RECYCLING IN SOLID WASTE MANAGEMENT

The Mechanical Sorting Process (MSP) may be a standalone facility, which usually called Materials Recovering Facility (MRF) and it is designed to handle materials collected from a single municipal/ household kerbside collection system, or more typically, to sort materials from several kerbside collection programs, as well as recyclables from commercial and industrial sources. These operations range in size and may be operated by local authorities, major private contractors, the community/third sector, and SMEs (Small and Medium Enterprises) who may also operate waste transfer stations.

A facility of this type receives, separates, and prepares recyclable materials that have already been separated at the source from municipal solid waste generated by either household or commercial sources.

The Mechanical Sorting Process (MSPs) could also be part of an integrated waste management facility (i.e. Mechanical - Biological Treatment facility), whereas it may be designed to handle mixed municipal solid waste. In this case the first step in the sorting process is the separation of the biodegradables of the rest of the waste. A materials recovery facility of this type accepts a mixed residual waste stream and then proceeds to separate designated recyclable materials through a combination of manual and mechanical sorting. The sorted recyclable materials may undergo further processing required to meet technical specifications established by end-markets (such as SRF manufacture) while the balance of the mixed waste stream is sent to a disposal facility

The Mechanical Sorting Process plays an important role in reducing the amount of waste sent to landfill sites. They are specialised plants that receive, separate, and prepare dry recyclable materials or mixed municipal waste. The recyclables go through a variety of mainly mechanical and some manual processes to obtain maximum recovery of materials that will re-enter the manufacturing process as a valuable commodity. The recyclable waste is typically separated into:

Glass (not in all feedstock)

Aluminium and steel cans

Paper

Cardboard

Plastic bottles and packaging

Other, non-recyclable residual material

In the facilities with Mechanical Sorting Process (MSPs) range of technologies are used to sort recyclables by their physical and chemical properties; shape, size, weight, magnetism, and optical scanning (paper and plastics). Although the recycling and sorting of waste is increasingly more sophisticated and mechanized, there remains a significant reliance on manual operations, particularly hand-picking, to ensure quality standards are met.

Mechanical Sorting facilities receive waste from collectors and process this waste in several stages. The result is one or more clean material fractions for recycling or further sorting, and a residual component for disposal – typically incineration or landfilling.

The configuration of sorting facilities varies from simple manual sorting lines to complex, automated multi-process sorting lines. The sorting process lies at the core of the waste sorting plant but is supported by a number of pre-input and post-output ancillary processes that enable the smooth running of the facility (Figure 1).

Incoming waste are separated into two fractions, the biodegradable fraction for further treatment or disposal and the remainder fraction for sorting

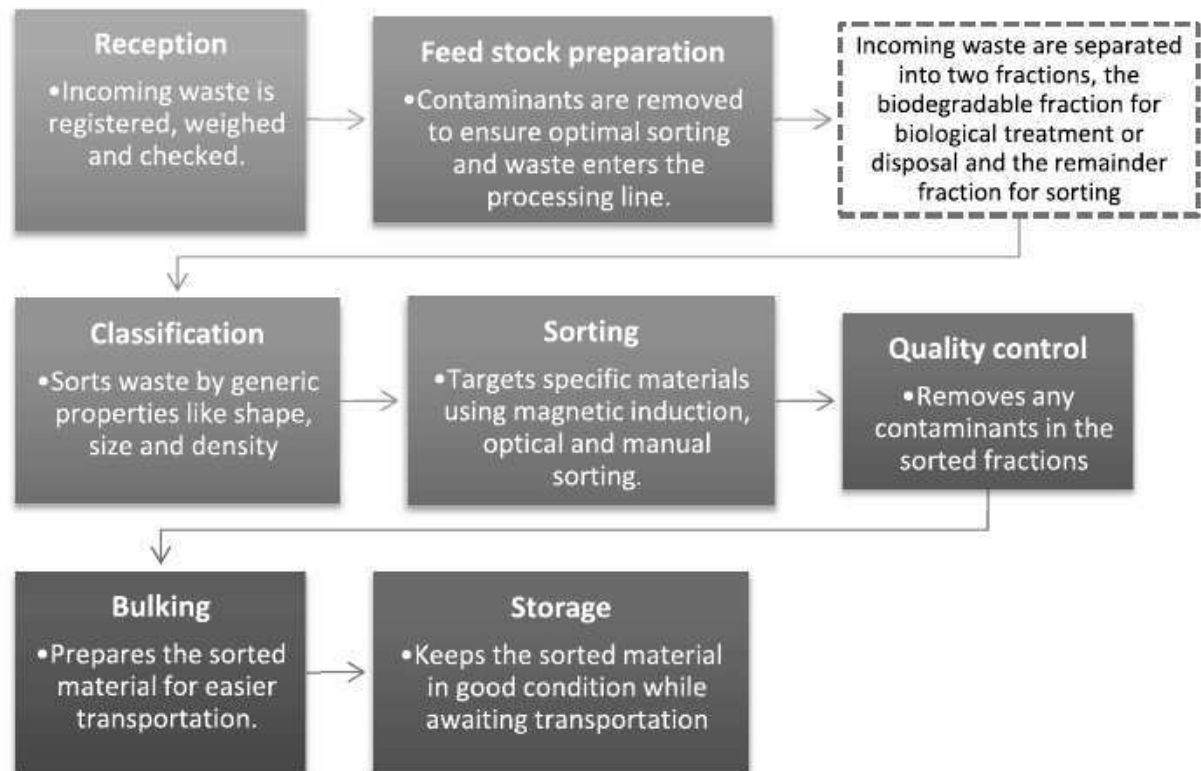


Figure 1. Mechanical sorting process.

Waste composition influences the steps and the technologies applied. The MSW generated tends to become a complex mixture of materials that demands complex technology-based sorting process to extract clean fractions. Such technologies must have the ability to sort an increasingly diverse range and volume of materials regardless of size, moisture content and/or contaminant level.

This high level of variation in waste streams usually leads to a combination of technologies that are applied to successfully separate the waste.

Table 1 briefly describes some of the main technologies employed in waste sorting plants.

Table 1. Overview of waste sorting technologies.

Waste screening	➡ Trommel screen	1. An angled rotating cylinder with holes that allow waste of a given size to fall through.
	➡ Disk Screen	2. A bed of vertical-spaced discs that transports large waste items but allows smaller items to drop through the gaps.
	➡ Oscillating screen	3. A vibrating/oscillating declined bed that allows smaller waste to pass through while transporting larger waste to the end.
Air separation	➡ Zigzag air classifier	4. Waste is dropped through an upward air current in a zig-zag shaped flue. Light waste is blown to the top, while heavier waste falls to the bottom.
	➡ Rotary air classifier	5. A trommel screen separator with an air current that captures the lightweight fraction.
	➡ Cross-current air classifier	6. Waste is fed on a conveyor and dropped through an air stream. The light components are blown horizontally to a collection point and the heavy components drop through.
	➡ Suction hood	7. Sucks lightweight waste directly from the conveyor belt.
Ballistic Separation		8. A steeply inclined bed with a perforated plate screen deck, with alternate vibrating elements. Light fractions are lifted by cams to the top of the bed, heavy fractions fall to the bottom.
Film grabber		9. Waste is accelerated onto a rotating drum with spikes. These hook plastic film and let other wastes drop.
Magnetic separation		10. Magnets either lift ferrous metal from the waste or hold ferrous metal to the conveyor while other waste can drop.
Eddy current separation		11. Eddy currents are used to push non-ferrous metals with magnets into separate collection points, with non-metallic waste falling into another.
Manual Sorting		12. Employees are positioned beside the conveyor and manually remove materials either in positive or negative sorting.
Sensor technology	➡ NIR (Near-infrared)	13. Used to differentiate between plastics (PET, HDPE, PVC, PP and PS).
	➡ VIS (Visual spectrometry)	14. Used to identify materials based on color.
	➡ XRF (X-ray Fluorescence)	15. Used to differentiate between metals/alloys (for example, copper from steel).
	➡ XRT (X-ray transmission)	16. Identifies materials based on atomic density- for example, halogens and organic components.
	➡ EMS (electromagnetic sensor)	17. Identifies metals based on their conductivity.

ANNEX 2: SITE SELECTION & PLANNING FOR MeRFS

The facility site selection is a complex multi-criteria and time-consuming process that usually raises arguments and conflicts between different stakeholders with different interests and opinions. Therefore, the site allocation of a facility with a mechanical sorting process siting procedure needs the use of a widely and transparently acceptable decision tool that utilises clear and comprehensive criteria and represents a multidisciplinary approach that takes into consideration the interests of all stakeholders.

When considering the planning and site allocation for a facility with a mechanical sorting process the following issues have to be considered:

- (a) Transportation Network
- (b) Topography
- (c) Soil Type
- (d) Wind Speed and Direction
- (e) Proximity and Access Considerations
- (f) Waste Sources
- (g) Air Emissions/ Health Effects.
- (h) Dust/Odour.
- (i) Flies, Vermin and Birds.
- (j) Noise
- (k) Litter
- (l) Water Resources
- (m) Proximity and Access Considerations
- (n) Utilities and Services
- (o) Land-Use considerations
- (p) Visual Intrusion; and
- (q) Public Concern.

The methodology and criteria used for assessing the suitability of sites and areas should be dependent on project criteria and local constraints. It requires careful consideration of multiple alternative solutions and potentially conflicting criteria, including economic, technical operational, environmental, and social factors (including stakeholder communication and dialogue). Factors that could be assessed when evaluating the selection of sites are outlined in Table 2.

Table 2. Site selection criteria

Economic aspects	• Costs of transport to and from site • Purchase value of the land • Development costs • Availability of (local) labour force
Technical operational	• Technical characterization (i.e. hydrological evaluation) • Access roads • Distance from utilities
Physical Features	• Topography • Water Resources • Surface Soils
Human Values	• Human Health

	• Landscape and Visual Intrusion • Recreation Historic Environment & Built Heritage Population • Employment Opportunities • Air Quality Noise and Vibration
Ecological Features	• Flora & Fauna • Habitats & Ecosystem Services • Designated Sites
Climate	• Temperature • Wind Direction
Land Features	• Development Potential • Land use Designation & Conflict
Logistics	• Traffic & Access Proximity to Users • Availability of Utilities • Adjacent Land Use

The process of selection normally starts with a list of available or desired sites, which is checked against knockout criteria. After removal of sites in breach of the knock-out criteria, the remaining sites are ranked in line with the desire to investigate the site further. Only the top-ranked sites will be examined in detail. Facilities with a mechanical sorting process are normally located close to waste sources, existing waste management facilities or near markets for the materials.

The facility with a mechanical sorting process siting procedure must be based on the following factors for the candidate locations:

- Geographical and geological considerations: locations that are sensitive in possible unintended leakage of pollutants that can cause permanent effects in the surrounding area must be avoided. Consequently, candidate areas that must be avoided for the development of such a facility with are the ones with problems related to landslides, intense seismic activity, flooding, geotechnical instability, protected species habitats, etc.
- Physical planning considerations like distance to residential areas, natural reserves, historical sites, facilities like airports, ports, etc., lakes, rivers, wetlands, and other features that are considered based on the location characteristics
- Hydrogeological considerations, like distance to and use of the underground water table, local surface water flows and their destination, etc.
- Landscaping: the operation of a facility with a mechanical sorting process can cause reversible changes to site topography. Locations with minimal effect on the greater area's morphology and attractive landscaping and future use of the area of the facility with a mechanical sorting process that adequate to the characteristics of the surrounding area increase public acceptance of the candidate location
- Selection procedures: the site selection procedure must be clear, straightforward, open to all stakeholders based on widely used and accepted decision-making supporting tools like GIS, Environmental Impact Assessment, Life Cycle Analysis, clear and comprehensive criteria, and weighting ranking, etc.
- Public involvement from the beginning of the site selection process is vital to gain public acceptance of the selected location. Issues like real estate values, aesthetics, heavy vehicles traffic, land use, concerns about the environment and public health, etc. should be raised and discussed during the public consultation process

The site selection process should normally include the following processes:

- Initial desktop study: the candidate locations for a facility with a mechanical sorting process must be examined based on characteristics like geology, hydrogeology, surface water flows and hydrology, environmentally sensitive areas, vegetation types, land stability, topography, land uses, etc.
- Site investigations, that will provide detailed information regarding the characteristics of candidate locations. Site investigations can include mapping of site geology, geotechnical investigations, identification of nearby groundwater wells and uses, sampling of water quality, flora and fauna, population and areas in the vicinity, cultural heritage sites, etc.
- Environmental Risk Assessment (see paragraph 3.1)
- Economic assessment that will examine every candidate site with economic criteria like land acquisition costs, construction, operation and monitoring costs, waste transport costs, etc.
- Community consultation will focus on community engagement and involvement in the site selection process. The community must be provided with all the necessary information and the opportunity to comment. The level of detail to be provided will vary depending on the nature and scale of the facility with a mechanical sorting process proposed but should include as a minimum, an assessment of the impact of the proposal on the surrounding community e.g. employment opportunities, altered traffic volumes, noise, dust and odor, access and distance to travel, etc. Additionally, consultation with the surrounding community may provide useful information on the community waste management needs and requirements of the facility.

ANNEX 3: DESIGN, CONSTRUCTION & OPERATIONAL REQUIREMENTS FOR MeRFs

Design and Construction Requirements for mechanical sorting facilities

General

- (1) A facility with a mechanical sorting process may be of many different variations, but it usually consists of the following units.
 2. Entrance - weighbridge
 3. Waste reception
 4. Mechanical Sorting
 5. Packaging
 6. Storage
- (2) It may also include units for further processing of recoverable materials, which could consist of refuse derived fuel (RDF) Unit and ferrous and non-ferrous metals cleaning unit.
- (3) Waste to be processed is unloaded in the waste reception area and grab loaded into the receiving hopper for conveying into the trommel.
- (4) The rotating trommel sorts the material into three different sizes. The first stream leaving the trommel on the fines' conveyor, transport cans through an over band magnet and an eddy current separator to separate steel and aluminium constituents, respectively. The residue from these sections is fed by conveyor to a stockpile for onward disposal.
- (5) The two other streams from the trommel carry paper, cardboard, and plastics to the main picking station. Several operatives (pickers) hand sort the individual components dropping the individual recyclables into individual storage bays beneath the picking floor. From the storage bays, the sorted materials travel on a conveyor to a baling machine for packaging prior to disposal.
- (6) Other conveyor locations in the process may also have operatives engaged in handpicking to ensure quality requirements are met.
- (7) The throughput of the plant is controlled by a supervisor in the control room.

Waste Reception

- (1) The road construction that will lead to the reception unit should have inclinations of less than 5% and curvature rays that ensure the easy and safe passage of vehicles.
- (2) The reception unit will include a manoeuvring and parking lot and will ensure easy access, fewer necessary manoeuvres, and easy removal of vehicles. There must be the necessary marking.
- (3) The design must provide for automatic opening - closing of unloading doors, sampling, or sampling location for large installations, as well as space for the placement of bulky and potentially dangerous containers and their removal from a special vehicle. The number of unloading doors should ensure a smooth flow of vehicles.
- (4) The capacity of the reception ditches must ensure the temporary storage of waste, usually for two (2) days. The reception areas should operate under pressure. The construction materials of the trenches will be either made of reinforced concrete or for small installations made of common steel of sufficient thickness and durable welds, so that there are no alloys from any collisions and the creation of sparks from the impact of the arms is avoided.
- (5) The supply of the above provisions will be done with crane bridges that will end in multi-legged grabbing and with hydraulic arms that will end up in multi-legged grabbing for small facilities. The crane bridges will be of the type of carriers with a moving trunk on them with a sufficient lifting capacity and a capable opening of a bridge. The bridge and

winch should have variable speed and the engines will be with variable revs and brakes. The engines will have high protection against moisture and dust.

- (6) The grabbers must be multi-legged, semi-closed, capable of maximum capacity and maximum width with open legs. They must have opening doors and sufficient power.
- (7) The fronts of the arms and the inner lining are made of high-strength alloy with friction. The exterior cladding is made of high hardness steel.
- (8) Maximum filling of the joint and its adaptation to materials of uneven shape should be ensured. A small opening-closing time should be provided so that more cycles are performed per minute.
- (9) Power strips are usually of the variable speed metal type. The surface of the film consists of modular metal sheets of sufficient thickness. The plates have extreme vertical protections, sufficient height, and internal vertical plates that facilitate the promotion and dosing of materials. The tape should have a sufficient number of chains (so as not to distort the central part of the film) and be the chains capable of resistance. The plates will be made of steel as well as the material of the frame and the guides of the chains. The chains will be made of high-strength steel and the motors must be protected from moisture and dust.

Supporting infrastructure

Fencing – entrance gate

The facility should have a barrier around the perimeter of the site to prevent the unauthorised entry of people and input loads. For this reason, the perimeter of the areas of the facility must be protected via a fence that will ensure the protection of the site. The fence must be made of galvanized iron ducts of 5 cm diameter, 2.50 m height, which will be encased in a concrete basis below the ground. The ducts will be vertical and will reach a height of 2.00 m above the ground. In the last 50 cm, the ducts will have a gradient of 30° to the external side of the fence. The edges of the ducts will be connected with a prickly wire net.

The prickly wire net will be 2 mm thick and will be installed in 2 rows. In both the vertical and the sliding parts of each duct, holes will be made for the reinforcement wire and the prickly wire net to be developed. The reinforcement wire will be 4 mm thick and will be installed in 3 rows. A rhomboid wire net with loops (5 X 5 cm) will be used to restrict the trespassing of rodents.

The distance between the ducts will be 3.00 m., and every 6.00 m iron struts will be placed of the same diameter as the ducts. The struts will be encased in a concrete basis, of dimension 0.50 X 0.50 X 0.60 m.

The entrance gate consists of two doors with 4.00 m length each and 2.50 m height. The entrance doors will open either automatically or manually. The doors will be coated with a wire net and be secured with a lock.

Right after the entrance gate, there will be posted an information sign that will include at least the following information:

- (a) Facility name
- (b) Name and contact details of Owner/Authority
- (c) Facility's operator name and contact details
- (d) Working hours of the facility
- (e) Facility supervisor

Weighbridge building

The weighbridge building is to serve facility's weighbridge and it is located next to the weighbridge. The building must have at least one main workroom with a sanitary unit and an entry hall with a kitchenette. The building shall be equipped with a desk and the necessary electronic equipment for weighing and data recording of the incoming/departing vehicles.

Weighbridge

The Facility's weighbridge is located close to the entrance of the facility. It ensures the accurate and systematic recording of incoming waste. All the incoming vehicles carrying waste loads are weighted before discharging their load in the reception area of the Facility. The weighbridge must be operating fully automatically. The weight of any vehicle must be recorded in dedicated software that must be installed in the computing system in the weighbridge building. The Weighbridge should provide data with increments of at least 5Kg. The computing system shall have the capacity to print receipts per vehicle and to store data of various incoming and outgoing vehicles and generate daily and periodic reports.

Wheel washing system

Before leaving the facility and entering the public roads, the waste vehicles will undergo wheel cleaning. The purpose of the wheel washing system is to wash the tyres of waste vehicles from mud and waste residues from the facility.

The wastewater from the washing basin must be collected and transmitted to the public sewer system via a suitably sized settling basin/ grease trap incorporating a debris screen.

Internal roads

A road network inside the facility will ensure access to all facility infrastructure. The surface of the internal roads will be asphalt and it will be designed and constructed for heavy vehicles according to local regulations. Based on the expected traffic loads, the road network can have 4m or 8m width (for one or two traffic lanes respectively) and the maximum longitudinal slope must be 8%.

Incoming loads sampling area

A special area for the sampling of loads of the incoming vehicles must be included in the facility. This area will be accessible in every weather condition, fenced, and paved with asphalt. It must be constructed in an area close to and after the weighbridge building.

Administration building

This building serves the facility's administration, the personnel, and visitors. The administration building must have at least the following rooms:

- (a) Offices
- (b) First aid provision office
- (c) Resting room for the people working on site
- (d) Meeting room
- (e) WC
- (f) Washroom/Showers/WC/Lockers (separate for men and women)
- (g) Kitchen

The Administration building can be also equipped with a control room for different operations i.e. SCADA system for the different sorting sections of the facility.

Maintenance building/workshop

This building will be used to cover maintenance, repair, and lubricating purposes of the machinery operating in the facility. The maintenance building must be equipped with all the necessary equipment for the maintenance of the machinery and must have at least the following room:

- (a) Main maintenance area/workshop
- (b) Storage room for materials and tools
- (c) Office for the maintenance personnel
- (d) WC
- (e) Kitchenette

Parking space

The vehicles of the facility's visitors and personnel must be parked in a dedicated area with an adequate number of parking spaces. The parking area in a facility must be developed close to the administration building

Fire protection zone

Inside and parallel to the fence, a fire protection zone of 10.00 m width must be foreseen for every facility. This area will be kept free of any vegetation and it will prevent the spread of any fire event from the facility, to the surrounding area.

Firefighting system

A firefighting system must be installed in the facility that will cover its whole area. The firefighting system must follow the local regulations and the requirements of the local firefighting service. One water tank must be installed in the site that will supply with water the firefighting system and firefighting vehicles that will visit the site in case of a fire event.

The water tank can be supplied by the surface water management system and must be full and accessible by heavy vehicles all the time.

Operational requirements for mechanical sorting facilities

General Considerations

- (1) All treatment activities must be conducted in a manner that minimise vectors, odour impacts, litter, hazards, nuisances, and noise impacts; and minimises human contact with, and/or inhalation, ingestion, and transportation of dust, particulates, and pathogenic organisms.
- (2) The facility is to be kept neat and tidy during waste treatment to prevent flies, rodents, odours, unsightliness, and accidents. The site must be swept, washed, and disinfected periodically, and litter picking should be undertaken on the premises as well as in the immediately adjacent areas daily.
- (3) Runoff from outdoor areas at recovery operations must be directed to the site storm-water handling system via a suitably sized settling basin/ silt trap incorporating a debris screen.
- (4) Contaminated runoff from indoor waste treatment operations, including runoff from cleaning/ washing activities, wash water from plant / equipment cleaning operations and leachate from waste must be directed to the sewer system, via a suitably-sized settling basin/ grease trap incorporating a debris screen.
- (5) The burning of waste, either in the open, inside buildings or in any form of incinerator is not allowed during or after waste treatment and is considered unacceptable because of aesthetics, odours, and the environmental as well as health impacts resulting from air pollution.

- (6) Wastes can be bulked-up for disposal or recovery elsewhere and can also be treated by sorting, separation, screening, baling, shredding, crushing and compaction.

Operational requirements

- (1) A mechanical sorting facility can receive only source-separated, non-putrescible recyclables for further processing.
- (2) Residues and processed recyclables must be stored separately. Recyclables must be maintained in a manner that ensures marketability is not adversely affected. Source-separated or processed and separated material that meets a beneficial use determination can be stored without time restriction so long as the storage volume conforms with the declared storage volume identified in the application or registration documents.
- (3) Unprocessed and processed recyclables that are intended to be recovered can be stored for a maximum of 180 calendar days, unless the following criteria are satisfied to justify a longer storage period:
 - (a) there is a demonstrated need to store for a longer period, such as a market agreement with terms of receipt based on greater than 180-day intervals or volumes that may take longer than 180 days to acquire.
 - (b) the facility has sufficient storage area to prevent a negative impact to public health or the environment; and
 - (c) the facility implements an inventory control system, including daily logs, to ensure that the processed recyclables do not remain at the facility for longer than the period approved.
 - (d) prior to storing unprocessed and processed recyclables for longer than 180 calendar days, the facility must notify the department of its intent and include justification based on the requirements of this subdivision.
- (4) Unprocessed recyclables that the facility does not intend to recover and that do not contain putrescible waste can be stored for a period not to exceed 14 calendar days.
- (5) Incidental putrescible waste received, or putrescible residues can be stored for a period not to exceed seven calendar days after receipt or generation.
- (6) Refrigerants contained in materials being handled must be safely removed and managed prior to compaction, crushing or shredding.
- (7) All recyclables and waste delivered to or leaving the facility must be weighed and recorded.

Environmental monitoring

Monitoring systems for air pollution, particularly for particulate matter, dust and odour emissions and noise levels must be indicated in the operation and maintenance plan.

ANNEX 4: MANAGEMENT ASPECTS FOR MeRFs

General Regulations

- (1) The maximum speed for all vehicles within the facility should not exceed the 20 km/hr. Traffic regulations for public roads will be valid also in the facility if no other specific guidance and/or traffic sign is in place.
- (2) The staff of the facility shall secure the safe operation of the facility and carry out the necessary maintenance and urgent repairs of the machinery and equipment available.
- (3) The staff of the facility is not allowed to carry out construction works on the site.
- (4) External users (suppliers of waste) shall comply with the instructions and orders of the staff of the facility.
- (5) The suppliers of waste shall accomplish their task and leave the site without any delay. Exemptions can be made only by the order of the staff of the facility.
- (6) The fees for disposal of the waste received are calculated based on the weight, determined at the weighbridge.
- (7) Scavenging and open fire is forbidden at the facility.
- (8) Smoking, eating, and drinking are not allowed outside the designated premises.

Recording and reporting of data

Input material

- (1) The operator of a mechanical sorting facility must measure the total weight in tonnes of mixed waste material received at that facility, from each supplier, during each reporting period.
- (2) The operator of a mechanical sorting facility must take samples of the mixed waste material received at that facility, from each supplier, during each reporting period, except where that material is to be transferred to another materials facility for the purpose of separating it into specified output material and measure the composition of those samples.
- (3) For the purposes of sub-paragraph (2), one sample must be taken for every 125 tonnes of mixed waste material received at the materials facility from each supplier.
- (4) The total weight of all the samples taken for the purposes of sub-paragraph (3) must provide an average weight of 60 kilograms or more per sample, and each sample taken must not weigh less than 55 kilograms.
- (5) For the purposes of sub-paragraph (2), measuring the composition of a sample taken means identifying the materials comprising that sample by reference to
 - (a) the types of target material, non-target material and non-recyclable material that is contained in the sample; and
 - (b) the weight in kilograms of each type of target material, non-target material and non-recyclable material that is so identified.
- (6) Target material that is identified in a sample taken for the purposes of sub-paragraph (2) must, as a minimum, be separately identified by reference to the following materials-
 - (a) glass,
 - (b) metal,
 - (c) paper,
 - (d) plastic.
- (7) If the sample taken under sub-paragraph (2) contains material particles, they are deemed to comprise the proportions of target materials, non-target materials and non-recyclable materials already identified as making up the other contents of that sample, and the

weight of the material particles must be apportioned according to those proportions for that particular sample.

- (8) For the purposes of this paragraph, in relation to a batch of mixed waste material received at a materials facility:
- (a) where that batch comprises, material collected pursuant to arrangements made by a waste collection service, that service is the supplier,
 - (b) where that batch has been transferred from another mechanical sorting facility, the mechanical sorting facility from which that material was transferred is the supplier,
 - (c) in a case not falling within paragraph (a) or (b), the person who collected the material or, if that person is not known, the person responsible for delivering it to the materials facility is the supplier,
 - (d) where the batch comprises material from more than one supplier, and the proportion of that batch attributable to a certain supplier cannot reasonably be ascertained, an estimate of the proportion is sufficient.

Output material

- (1) Apart from the mixed waste material mentioned in sub-paragraph (2) and the specified output material mentioned in sub-paragraph (3), the operator of a materials facility must measure the total weight in tonnes of all other waste material that leaves the facility in each reporting period.
 - (2) The operator of a materials facility must measure the total weight in tonnes of all mixed waste material that leaves the facility in each reporting period to be transferred to another materials facility for the purpose of separating that material into specified output material.
 - (3) The operator of a materials facility must measure the total weight in tonnes of specified output material that leaves the facility in each reporting period.
 - (4) The operator of a materials facility must take samples of the specified output material produced at that facility in a reporting period and measure the composition of those samples.
 - (5) For the purpose of fulfilling the requirements in sub-paragraphs (3) and (4), the specified output material must, as a minimum, be identified by reference to the grade of glass, metal, paper or plastic material making up each batch of specified output material.
 - (6) For the purpose of sub-paragraph (4), measuring the composition of a sample taken by the operator means identifying the materials comprising that sample, by reference to:
 - (a) the type of target material, non-target material and non-recyclable material that is contained in the sample; and
 - (b) the weight in kilograms of each type of target material, non-target material and non-recyclable material that is so identified.
- (1) The samples mentioned in sub-paragraph (4) must be taken at a minimum frequency of once per the amount in tonnes that is specified in the second column of the following table, in relation to the type of target material that is mentioned in the first column, for any sample taken.

Target material	Amount
Glass	50 tonnes

Target material	Amount
Paper	60 tonnes
Metal	20 tonnes
Plastic	15 tonnes.

- (8) The minimum weight of any sample taken for the purposes of sub-paragraph (4) is:
- (a) 10 kg in relation to glass target material,
 - (b) 50 kg in relation to paper target material,
 - (c) 20 kg in relation to plastic target material; and
 - (d) 10 kg in relation to metal target material.
- (1) For the purposes of sub-paragraph (5), the grade of a material means a description of that kind of material by reference to its particular material specification.
- (2) If the sample taken under sub-paragraph (4) contains material particles, they are deemed to comprise the proportions of target materials, non-target materials and non-recyclable materials already identified as making up the other contents of that sample, and the weight of the material particles must be apportioned according to those proportions for that particular sample.

Records

1. The operator of a materials facility must record the following information:
 - (a) the measurements regarding the paragraph "Input Material",
 - (b) details of all the samples taken under sub-paragraph (2) of paragraph "Input Material" including the weight of each sample and its composition,
 - (c) the measurements taken under paragraph "Output material" and details of where the other waste material that leaves the facility in each reporting period is sent to;
 - (d) the measurements taken under sub-paragraph (2) of paragraph "Output material", and details of where the mixed waste material that leaves the facility in each reporting period is sent to;
 - (e) the measurements taken under sub-paragraph (3) of paragraph "Output material" and details of where the specified output material that leaves the facility in each reporting period is sent to;
 - (f) details of all the samples taken under sub-paragraph (4) of paragraph "Output material" including the weight of each sample and its composition,
 - (g) details of the amount in tonnes of specified output material that is produced by the materials facility in a reporting period, by reference to the grade of glass, metal, paper and plastic target material that makes up that batch of material.
- (2) The information recorded under sub-paragraph (1) must:
 - (a) be retained by the operator of a materials facility for a minimum of four years from the date that it is first recorded; and
 - (b) be produced for inspection by the competent authority if required during those four years.

Reports

(1) The owner/operator of a mechanical sorting facility must provide a report to the competent authority that includes the information set out in sub-paragraphs (3) and (4).

(2) The report mentioned in sub-paragraph (1) must be:

(a) produced in electronic format; and

(b) submitted to the competent authority in respect of a reporting period within one month of the expiry of that period, and at least once per year. The overall structure of the annual report is presented at ANNEX 5.

(3) The following information must be provided for all mixed waste material that is received by the materials facility during a reporting period:

(a) the measurements taken under sub-paragraph (1) of paragraph "Input Material",

(b) the total number of all samples taken for each supplier under sub-paragraph (2) of paragraph "Input Material",

(c) the total weight of all the samples taken for each supplier under sub-paragraph (2) of paragraph "Input Material",

(d) the average percentage composition levels of all of the samples taken under sub-paragraph (2) of paragraph "Input Material" for each supplier, by reference to the following target materials:

(i) glass,

(ii) metal,

(iii) paper,

(iv) plastic.

(e) the average percentage composition levels of each of the following categories of material found in all the samples taken for each supplier under sub-paragraph (2) of paragraph "Input Material":

(i) target materials,

(ii) non-target materials; and

(iii) non-recyclable materials.

(f) the standard deviation of the average percentage composition levels for the target materials found in all the samples taken for each supplier under sub-paragraph (2) of paragraph "Input Material".

(4) The following information must be provided in respect of specified output material that leaves the materials facility during a reporting period:

(a) the measurements taken under sub-paragraph (1) of paragraph "Output material" and details of where the other waste material is sent to in a reporting period;

(b) the measurements taken under sub-paragraph (2) of paragraph "Output material" and details of where the mixed waste material is sent to in a reporting period;

(c) the measurements taken under sub-paragraph (3) of paragraph "Output material",

(d) the total number of all samples taken under sub-paragraph (4) of paragraph "Output material",

(e) the total weight in kilograms of all the samples that are taken under sub-paragraph (4) of paragraph "Output material";

(f) the average percentage composition levels of all of the samples taken under sub-paragraph (4) of paragraph "Output material", by reference to the grades of glass, metal, paper and plastic identified within those samples;

(g) the average percentage composition levels of each of the following categories of material found in all the samples taken under sub-paragraph (4) of paragraph "Output material":

- (i) target materials,
- (ii) non-target materials; and
- (iii) non-recyclable materials.

(h) the standard deviation of the average percentage composition levels for the target materials found in all the samples taken under sub-paragraph (4) of paragraph "Output material".

(5) In this paragraph, "average" means the arithmetic mean."

Environmental Management

Litter

Litter management should include:

- (a) Covering of inbound and outbound loads with tarps or other covers
- (b) Storage of waste and recyclable materials in containers and/or buildings as intended in the design
- (c) Use of fences in appropriate locations to contain wind-blown litter from escaping the site
- (d) Retrieval of litter on the site, surrounding properties, and along roads leading to the site

Dust

Management of dust may include:

- (a) Use of paved roads
- (b) Reduce speed limits on unpaved roads
- (c) Prohibit powdery or granular materials that are prone to creating dust problems
- (d) Use "mistlers" in enclosed buildings to knock down dust particles

Odours

Odour management may include:

- (a) Use of vegetation buffers around the site
- (a) Timely removal of stored waste
- (b) Clean or wash containers and tipping floors
- (c) Use building ventilation
- (d) Maintain adequate setbacks from neighbouring development (siting & design)

Noise

Mitigation of noise may include:

- (a) Use of noise barriers such as trees or fences
- (a) Used paved road surfaces and maintain roads to lessen traffic noise
- (b) Maintain adequate setback from neighbouring development (siting & design)
- (c) Schedule operating hours to avoid early morning or evenings
- (d) Maintain equipment to operate within noise limits set by the manufacturer

Insects, animals, and birds

The control of 'vectors' such as insects, animals and birds should include:

- (a) Timely removal of stored waste
- (b) Elimination of areas where water collects on site
- (c) Use electric fences if bears are a problem
- (d) Hire exterminators in cases where insect or rodent infestations occur

- (e) Use electric fences if bears are a problem
- (f) Hire exterminators in cases where insect or rodent infestations occur

Health and Safety

- (1) All works and operations at the facility shall be carried out in accordance with current rules and legislation regarding occupational health and safety.
- (2) Regular and documented instructions of the facility staff concerning safety rules are mandatory. Such documented instructions are further required for the newly employed staff and when new machinery, equipment or facilities are taken into operation.
- (3) Accidents can be minimised by regularly implementing safety and training programmes and effective site management. These programmes should include the following:
 - (a) Identification of potential sources of risk,
 - (b) Assessment of the degree of risk from these sources,
 - (c) Determination of procedures for addressing the risks,
 - (d) Development of procedures to minimize accident/ risks when they occur; and
 - (e) On-going monitoring to ensure proper implementation of safe working procedures.
- (4) The operator, considering these provisions, should ensure the safety, health, and welfare at work of all persons employed in the facility. This duty should include the following priorities:
 - (a) Plant and machinery should be maintained in a safe condition,
 - (b) Risks should be appraised, and safe systems of work planned, organized and performed,
 - (c) Suitable safety information, instruction, training, and supervision should be provided,
 - (d) Suitable protective clothing and equipment should be provided and maintained,
 - (e) Emergency plans should be prepared and revised as necessary,
 - (f) That the presence of any article or substance on the site must not present unacceptable risks to health; and
 - (g) Adequate welfare facilities for staff must be provided and maintained.

Ergonomics at Mechanical Sorting facilities

- (1) Conveyor belts are used in a range of industries to move materials. Using these systems in the workplace can reduce the risks of musculoskeletal injury (MSD) by avoiding the need for excessive repetitive bending, lifting, and carrying.
- (2) In MSFs conveyor belt workstations (picking-stations) should be professionally designed to ensure that operators do not excessively lean, stoop, twist, or over-reach, since these repetitive movements can themselves lead to musculoskeletal injury.
- (3) The workplace lay-out, size of the conveyor, type, through put and height of material, and how material is handled, are all factors that should be considered when assessing the risk of MSDs in a task undertaken at a conveyor.

Personnel

One or more persons must be formally designated for facility safety issues. These persons should understand the statutory requirements, be able to act as competent persons under the legislation and ensure the continued maintenance of a safe system of work. The later tasks should include matters relating to training and supervision. They should be responsible for the identification of hazards and designated managers should transmit such information by verbal or

written instructions to the workforce, contractors, facility users, and facility visitors. Designated persons should undertake regular site safety inspections, with written reports of inspections maintained at the site.

Training

- (1) Operators should provide suitable training and instruction to site employees, both full time and part-time. The operator should also ensure that any contractor and sub-contractor working on site is also informed of the hazards and the necessary precautions. There is also a responsibility for persons employing contractors to ensure that the latter can act as competent project supervisors concerning the safety aspects of the relevant design and construction elements of their work. All site personnel should be familiar with contingency procedures in the event of accident, injury, fire, etc.
- (2) The locations of emergency equipment should be identified during routine employee training. Phone numbers for local police, fire and ambulance services, hospitals, and other relevant information should be prominently displayed for use in the event of an emergency.

Staffing Levels

- (1) All staff and users of the facility should be effectively supervised. No site open to receive waste should be manned by one member of staff working on their own. Similarly, no unloading of vehicles should occur in the absence of site staff or out of their immediate view.

Medical

- (1) Good personal hygiene is essential to workers on waste treatment facilities and hence washing facilities supplied with hot and cold water must be provided. It is suggested that all workers at the facilities, including those employed temporarily by the operator, or by contractors working on the site, should have adequate medical protection and vaccination against diseases and tetanus. This protection must be kept up to date, with boosters given at 10 yearly intervals or sooner according to the medical instructions. Workers must pass a mandatory preliminary and periodical medical examination in accordance with the existing requirements.
- (2) A first aid box should be available on-site in a clearly marked location. The contents of the box should be monitored for use so that supplies are checked regularly by a named individual responsible for its upkeep. The operator should arrange for recognised occupational first aid training, with a minimum of one person with a first aid qualification normally present on site. All staff should be familiar with the first aid facilities available on site.

Personal Protection Equipment

- (1) High visibility clothing should always be provided and worn by all site staff and visitors during their presence in the facility. Safety boots and/or wellingtons should be supplied to all site workers. They should have steel toecaps and have a steel insert in the sole to resist injury from projections of glass, metal, or other items in the incoming waste. Gloves should be supplied as required. The gloves should be puncture-resistant and should be suitable for the relevant task, e.g. litter collection, vehicle fuelling, cold weather conditions. Safety helmets, earplugs, and eye protection should be available, as necessary. Operatives at waste treatment facilities work in all weather conditions and will need to be provided with suitable windproof wet weather clothing.
- (2) When working at the facility, where waste is handled, the following personal protective equipment shall be used additionally dust masks or respirator devices and goggles or full-face masks.

- (3) Reflective safety jackets or waistcoats must be worn all the time. The Operator of the facility is responsible for providing necessary personal protective equipment as stated above or which might be needed in a specific situation or for a specific assignment.

Traffic and Machinery

- (1) In general, rules, which apply to traffic on public roads, also apply to the premises of the facility. Additionally, an overall speed limit for all vehicles and mobile machinery of a maximum of 20 km/h shall apply inside the site of the facility.
- (2) The Operator of the facility shall display clear markings and signboards stating the directives for all traffic at the premises. Signs stating the overall speed limit must be placed at the entrance gate. Other signs within the premises must show driving directions for the incoming and outgoing vehicles with clear marking of one-way roads and right of way at crossings.
- (3) Areas where traffic of transport vehicles and mobile working machinery, e.g. the front loader, are mixed and areas, where staff may be working, are potential risk spots. These areas shall be clearly marked for the attention of the drivers and pedestrians, and the speed limit shall be reduced even further.
- (4) Only vehicles and other mobile machinery that either belong to the facility or have a legal task are allowed at the premises of the facility. The vehicles may only move along the internal roads of the facility observing the above-stated rules for traffic.
- (5) When moving by foot on the premises or working on the ground all staff and visiting personnel shall always watch out for traffic. Special attention shall be paid to reversing vehicles and to machinery in operation.
- (6) The Operator is responsible for maintaining sufficient illumination of trafficked and working areas during working hours.
- (7) Any machinery may only be used for the purpose it was constructed. The following general rules must be observed:
 - (a) Any adjustments of machinery and its movable parts may only be done while the machinery is turned off.
 - (b) A machine may never be left running idle. The engine shall be turned off and the key removed from the machinery/vehicle when the operator leaves the machine.
 - (c) No machinery or vehicle may be left with movable parts - e.g. the shovel of the front loader - lifted.
 - (d) The areas, where vehicles or other machinery usually heats up, shall be kept free from combustible materials to minimize the risks for fire.
 - (e) At all times, the windows of the cabin of any machinery or vehicle shall be kept clean, to ensure a clear view for the operator.

Scavenging

Scavenging is the separation and removal for re-use of items. The practice is dangerous and interferes with the efficient operation of a facility. Scavengers should be prohibited by an operator wishing to manage its site in line with international best practice.

Security

- (1) Security measures generally include maintaining perimeter fences and locking of access gates when the facility is not open to the public. During operating hours, security is maintained with site supervision. A well-lit site may also discourage site abuses during darkness.
- (2) Security should be maintained at mechanical sorting facilities to prevent:
 - (a) unauthorised use
 - (b) depositing of prohibited waste
 - (c) vandalism and abuse

- (d) from physical attack/ theft of their property. of workers and users while on site
 - (e) Prevention of access to the site except for legitimate purposes, i.e. prevention of unauthorised salvaging / theft / loitering.
- (3) A system whereby guards would be required to report on all incidents during their shift should be in place, with effective follow-up of all incidents.
 - (4) A monitoring system should always be introduced to ensure the efficiency of the guards.
 - (5) It is to be ensured that security is provided during hours of operation.
 - (6) Where required, the duties of the security guards must be extended to assist on operational matters, e.g. for the monitoring of incoming loads to verify that no unauthorised waste enters the site. Such additions to their duties are however formally to be added to their roles and responsibilities.
 - (7) Security guards are not to interfere with any of the operational matters for which they are not specifically tasked.
 - (8) Unless there is a particular operational need for the facility to be accessible after hours, the site must be locked outside of the operating hours.
 - (9) Appropriate communication systems are to be provided that will enable the guard on site to call on the backup resources from anywhere on site.
 - (10) The contact details for the person responsible for the facility must be clearly visible from the outside, in the event of there being a need to obtain access in the event of an emergency.

Fire protection

- (1) A material sorting facility fire protection plan could include, but not necessarily be limited to the following:
 - (a) Having a readily available, pressurised water supply, complete with standpipes, hose bibs, and, in some cases, either a sprinkler system or hydrants for connection to pumper trucks.
 - (b) A road design that permits easy access by fire-fighting equipment.
 - (c) Providing aisles between windrows and buildings as a firebreak and for access.
 - (d) Providing buffer distances between potentially combustible materials.
 - (e) Access to earth moving equipment, e.g. a tracked excavator, in the event a deep subsurface fire occurs and needs to be isolated or dug out.
 - (f) Having a readily available stockpile of soil to smother fires (as an alternative to using water)

Emergency procedures

- (1) Emergency procedures are to be developed as part of the operation and maintenance plan. The emergency plan should be communicated to all personnel, with refresher courses being provided at regular intervals.
- (2) Security guards should not only be trained in the protection of the facility, but must also be trained in first aid as well as fire-fighting techniques to deal with situations when they may be the only people on site when a fire is detected.
- (3) A communication network must be established that will ensure involvement from all relevant parties in the event of an emergency; the security company, GWMF owner, operator, as well as police, fire brigade and ambulance, where required. Such information is to be communicated with to relevant stakeholders on a regular basis. The following is to be provided for:
 - (a) Safety, emergency, and fire-protection plans and procedures.
 - (b) Contact details with a means of communication with the fire brigade, police, or ambulance services.
 - (c) First aid equipment.
 - (d) Firefighting equipment.

- (e) The relevant protective equipment and clothing.
- (4) All fire extinguishers as well as first aid kits are to be placed on a routine maintenance plan to ensure that such equipment is always ready for use.

Input acceptance procedure

Waste acceptable for reception at the facility

During the reception procedures, the Operator shall ensure, that only waste, which can be accepted at the mechanical sorting facility is admitted and that the waste is controlled and registered before admittance. Permitted wastes are limited to non-hazardous wastes and do not include hazardous wastes such as asbestos. The facility can receive only solid waste as listed in its environmental and operational permit. Waste shall only be accepted if it is of a type and quantity listed in Table 2 and it conforms to the description in the documentation supplied by the producer and holder.

Table 2. Waste types for mechanical sorting process

20	MUNICIPAL WASTES (HOUSEHOLD WASTE 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
20 01 02	Glass
20 01 39	Plastics
20 01 40	Metals
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
15 01 02	plastic packaging
15 01 04	metallic packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 07	glass packaging

Permission for disposal

Only wastes from waste producers, who have a valid permit for disposal, are accepted.

Together with the first delivery, the waste producer must apply for the delivery of waste to the facility. The application shall state the following data:

- Full name of the organisation/company
- Address
- Telephone number
- Managers' names.
- Registration number/code of the truck(s) to be used for the delivery of waste to the facility.
- Types of waste to be delivered

- Documentation for the waste disposal approval licensed by the Municipality

After the first delivery the waste producer receives the following documents for admissible waste:

- A registration card containing Client No, which will define the registered names, address, telephone- and truck registration number(s).
- Waste declaration, which specifies the types of waste that the waste producer, is allowed to deliver to the facility.
- Waste collection companies must obtain similar registration cards for each of their collection trucks at the first delivery of waste to the facility.

Non-Conforming Waste Consignments

Non-conforming waste consignments arriving at a waste disposal site may be identified at:

- Site reception,
- Weighbridge,
- Waste inspection facility; and
- Mechanical sorting.

Non-conformances may be due to the documentation being incorrect, insufficient, or inaccurate, or due to the waste not conforming to the documentation, the waste management license, or other legal requirements. The MSF's management team should detail in writing how to deal with nonconforming wastes. All site personnel should be aware of the chain of reporting and the actions to be taken. An area should be set aside for vehicles to be held, pending a decision regarding their future. The regulatory authority should be contacted to provide advice regarding whether the load can be accepted or whether it should be recognized to another location.

In the case of the delivery of large quantities of waste, the facility must be informed in advance. The facility determines the time for the delivery.

Exclusion of waste suppliers

The Mechanical Sorting Facility Operator can deny suppliers to use the facility if the suppliers intentionally deliver prohibited waste or repeatedly violates the site regulations.

Reception of Waste in Small Vehicles or Private Cars

Private individuals can deliver waste for at the Mechanical Sorting Facility by their transport without prior agreement. The Mechanical Sorting Facility Operator must direct the relevant vehicles in the incoming loads sampling area for load control.

Control of incoming waste

All waste delivered to the facility shall be controlled by the Mechanical Sorting Facility Operator. The control comprises:

- (a) Registration of the waste transportation truck and the waste producer.
- (b) Weighing and registration of the waste.
- (c) Control of delivery documents (i.e. declaration and registration card).
- (d) Direct visual control of the waste for type and composition for compliance of waste type with documentation.

- (e) Waste delivered in trucks shall be inspected visually at the reception area in connection with the weighing procedure and after unloading in the Mechanical Sorting Facility.
- (f) All information is recorded in the data system, stored and secured.

Registration

- (1) Records of all data concerning reception and transport of waste to and from the Mechanical Sorting Facility are registered in the software data system connected to the weighbridge. The operator of the weighbridge and registration system is responsible for the input to the data system of all relevant data for each incoming truck, for each shipment of waste leaving the Mechanical Sorting Facility or being rejected at the gate. Input data will consist of:
 - (a) Date and time for the arrival of the delivery to the Mechanical Sorting Facility.
 - (b) Data regarding the waste supplier:
 - (c) Full name of the company.
 - (d) Address.
 - (e) Telephone number.
 - (f) Managers' names.
 - (g) Registration number/code of the truck.
- (2) Companies delivering waste regularly will receive a registration card as described previously. The above data is encoded in the card and will automatically be recorded in the computer system.
- (3) The waste producer and the origin of the waste as stated in the waste declaration
- (4) If the waste is delivered in trucks that have no registration card the above-mentioned data shall be recorded manually.

Weighing and registration of the waste

- (1) All incoming and outgoing trucks carrying waste shall pass over the weighbridge and be weighed and registered. Data from the weighing procedure (including data for rejected waste and waste transported from the Mechanical Sorting Facility) shall be recorded in the data system.
- (2) Persons specifically trained in its use shall operate the systems. A special instruction manual for operating the data recording system will be prepared for the staff by the supplier of the weighing system.
- (3) The manufacturers' operation manuals for the individual units shall be adhered to strictly.
- (4) Each weighing procedure shall as a minimum comprise:
 - (a) Truck registration number
 - (b) Owner of the truck
 - (c) Waste origin/producer
 - (d) Waste type
 - (e) Weight of the waste.
 - (f) Acceptance/non-acceptance of the waste at the Mechanical Sorting Facility

- (5) Data from each weighing procedure shall be recorded in a database. At the end of each day, a back-up copy of the weighing of the day shall be produced in an adequate storage unit i.e. USB flash drive, CD, etc. The back-up files shall be stored in the Administration Building.

Rejection of Waste

- (1) If the control shows that the waste is not in compliance with the types of waste permitted to be disposed of at the Mechanical Sorting Facility, then the waste shall be rejected.
 - (a) If the waste is still on the delivery truck, the driver will be required to return the waste to the producer of the waste. The waste producer can then perform a pre-treatment (e.g. sorting) to bring the waste into compliance with the types of waste for which he has an approved declaration, and which will allow the Mechanical Sorting Facility to receive the treated waste.
 - (b) If the waste is already unloaded at the Mechanical Sorting Facility reception area, but not yet processed, the waste shall be loaded back into the truck and returned to the waste producer at his expense.
 - (c) In case it is not possible to re-load the waste into the truck (e.g. when the waste has been delivered in closed or compacting trucks) the waste will then be loaded into an open maxi-container and returned to the waste producer or the transporting company at his expense.
- (2) If a more detailed analysis of the waste is required before final acceptance or rejection, the waste load temporarily rejected and is returned to its producer for storage until the final decision can be made.
- (3) For all incidents where delivery is rejected, the Site Manager must issue a violation statement and inform the competent authority(ies).

Waste Supplier Departing the Facility

For conforming waste, the truck driver will receive a confirmation of the delivery. The receipt documents will indicate the basic delivery data, the delivered quantity (tons), and the fee for receiving the waste at the facility.

ANNEX 5: INDICATIVE CONTENTS OF THE ANNUAL REPORT

Executive Summary

1. Overview
2. Facility Information
3. Mechanical Sorting Facility materials' input
4. Quantity and quality of products
5. Summary of Environmental Monitoring Results
 - 5.1. Weather conditions/ meteorological data
 - 5.2. Environmental monitoring tests and results
 - 5.3. Proposals on Environmental Monitoring Program
6. Summary of Mechanical Sorting Facility Personnel Training Program
7. Emergency and/or corrective actions and measures
8. Annexes

Annex A – Data and analysis regarding the input – output of materials

Annex B – Annual Permit Renewal Application and Treatment Fees

Annex C – Environmental monitoring data (PM, dust, odour, noise, etc.)

Annex D – Annual Operational Data (operational faults etc.)