NABERS

The Rules

Waste

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1 Introduction

A NABERS Waste Rating is an independent benchmark of a building's waste management performance expressed on a star rating scale. It assesses the environmental impact of operational waste materials leaving a building. NABERS rates those elements that organisations have control over. The Waste Rating assesses buildings on how well they separate and divert waste generated in the building into streams that can be re-used and recycled, and whether those materials are likely to go to a facility that will recover the materials.

To obtain a Waste Rating for a building, sufficient data must be uploaded to the NABERS Waste Manager platform ('the platform') and verified by a NABERS Accredited Assessor ('an Assessor'). Assessors are professionals accredited by NABERS because they are able to perform a waste rating in line with these rules. Data could be uploaded from a variety of sources including the building owner, building manager, waste assessor or waste management company.

An accredited Waste Rating is awarded when the NABERS National Administrator certifies a rating that has been completed and lodged by the Assessor. The National Administrator may independently audit the rating and can assist in resolving complex technical issues.

Building owners and managers can use the platform to track their waste management performance without engaging an Assessor but cannot publicly promote the NABERS rating until the data has been verified through the Accredited Assessment process.

This document fulfils two purposes:

a) A guide to the data requirements for a NABERS Waste Rating, and how that rating is calculated;

b) A set of rules for how Assessors must check the data for the rating.

Interim updates to this document (Rulings) can be found on our website. For guidance on how to use the platform, refer to our user support documents.

1.1 How ratings are calculated

The fundamental calculation is the recycling rate (RR) based on 12 months of waste data. The recycling rate measures the extent to which materials leaving the building are diverted from landfill.

The recycling rate is calculated as follows:

$$RR(\%) = \frac{Total\ Recyclable\ Materials\ (kg)}{Total\ Materials\ Generated\ (kg)}$$

Input data for this calculation can either be the actual weight of bins leaving the premises or a count of bins collected by a waste contractor multiplied by a density factor. The recycling rate is adjusted by a contamination rate applied to each stream. This rate is determined by on site audits, or through a NABERS standard contamination rate.

NABERS then applies a data quality adjustment to the recycling rate. This step adjusts the rating to reflect the quality of the data used in the rating.

The final adjustment to the rating is the Material Recovery Score, which assesses the extent to which materials leaving the building were recovered for beneficial re-use and reduced potential pollution.

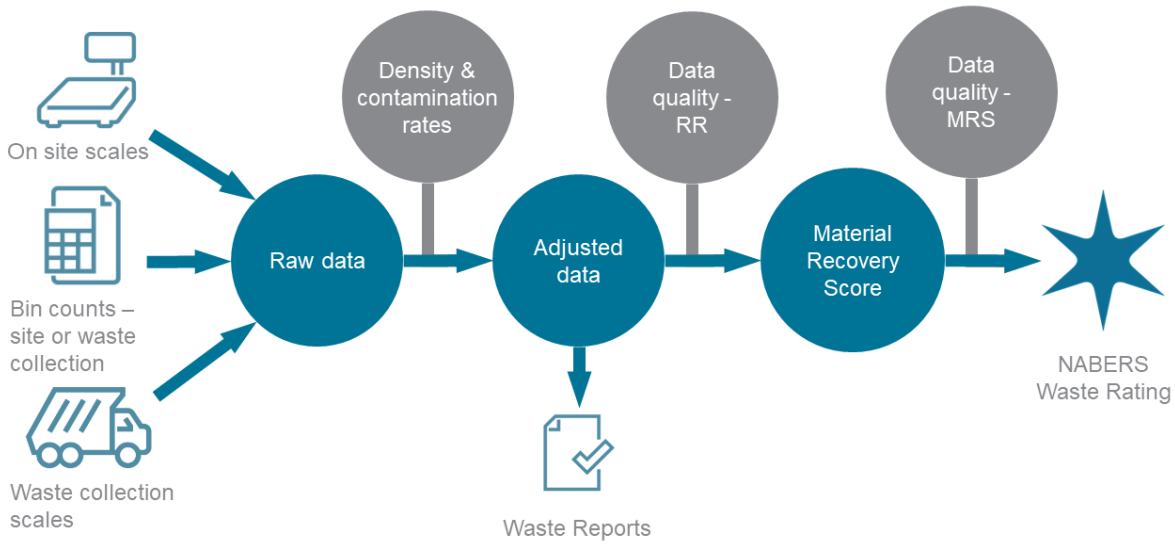

Figure 1: Waste Rating methodology

The unit of measurement for the platform is referred to as a "bin service". A bin service is the combination of waste stream, collection equipment and size, and allocated dock. E.g. If a building has a general waste collection with an assortment of bins in two sizes then it will have two bin services for general waste:

a) 240L general waste bins is one service;

b) 660L general waste bins is another service.

By calculating ratings in this way, NABERS encourages building managers to:

1) Provide bins for a range of waste streams, encouraging more waste separation and better-quality materials for recycling;

2) Put processes in place to reduce contamination of recycling streams;

3) Write high quality data requirements into their waste and cleaning contracts;

4) Investigate their downstream supply chains to establish the outcome of resources leaving their building.

1.2 Process overview

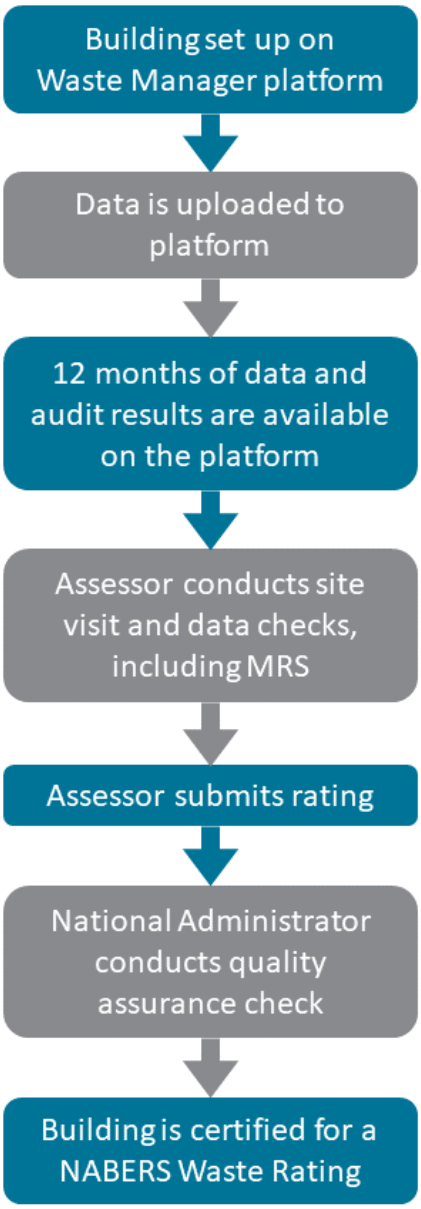

Figure 2: Process overview

A more detailed process map is available in Appendix E*: Process to lodge Waste Rating*.

1.3 Information required for a rating

The following information is required, as a minimum, for a rating:

a) The building's address and total net lettable area (NLA);

b) The number, size and type of bin for each waste stream service presented for collection;

c) 12 months of collection data, by pick-up, for all core waste stream services (refer section 3.2).

The following additional information will improve data quality and the Material Recovery Score and may improve the rating result:

1) Actual weights per bin per collection (see section 6 for how NABERS treats data quality) OR a bin density audit if weight-based data is not available;
2) A contamination audit (section 5);
3) Second source(s) of data for the data verification check (section 6.2);
4) Information and evidence for the material recovery pathway for each bin;
5) Values from composition audits for mixed materials bins.

Individual ratings may require additional information or documentation depending on the circumstances of the building. A more detailed list is included in Section 9.

1.4 Roles and responsibilities

Table 1: Waste Rating roles and responsibilities

Role	Description
Platform Administrator	Responsible for building set up on the platform and assigning a specific assessor to complete a rating. Has full edit and access rights to the platform.
Waste Data Provider	Responsible for uploading waste data to the Waste Platform. This can be anyone who has access to relevant data, such as the waste contractor, cleaning contractor, the building manager, the sustainability manager, or a waste data consultant.
NABERS Accredited Assessor	Responsible for lodging the rating as per these rules. This includes: a) Ensuring the data entered in the NABERS Waste Manager platform is correct. This means checking: 1) All core waste streams are included 2) Bin configuration on the platform reflects site conditions 3) Data integrity (e.g. the correct procedures for weights and bin counts is being followed and data entry procedures are acceptable); 4) There are no unexplained anomalies in the data;

	5) Density and contamination rates are consistent and match audit results; b) Conducting or supervising waste audits to determine contamination and density rates; c) Collecting data to establish building specific Material Recovery Score values. For the full list of assessor tasks see *Appendix E: Process to lodge Waste Rating*.
National Administrator	The National Administrator checks rating data once it has been submitted and provides the NABERS certificate. The National Administrator provides technical advice and rulings.

1.5 Situations not covered in the Rules

These Rules are intended to cover common waste practices in Australian buildings. If a waste management procedure is not clearly covered by these rules, or you are unsure how to apply this document to specific cases, then contact the National Administrator. The National Administrator will either provide clarification on how to apply the existing rules or consider amending the rules.

Current rulings can be found on our website.

1.6 Related documents

The following documents provide further guidance on the rules and assessor responsibilities and should be considered when assessing a building for a NABERS rating:

a) NABERS Waste calculation spreadsheet (available from the National Administrator)

b) Additional technical rulings on specific issues

c) Waste data upload spreadsheet for the NABERS Waste Manager platform

d) User support documents for the NABERS Waste Manager platform

All documents are available on the NABERS website: http://nabers.gov.au

2 Waste rating types and buildings

2.1 Currently available rating types

NABERS ratings are founded on industry-wide benchmarks, so that similar buildings can be fairly compared. While these rules are written to cover a variety of commercial buildings, NABERS can only rate buildings where we have developed an appropriate benchmark.

The following building types can currently be rated under these rules:

Table 2: Currently available rating types

Building Type	Benchmark based on	Benchmark bands
Office buildings (base building)	Recycling rate of building managed wastes only (see section 3.1.1 for managed waste definition)	6 stars > 74% 5.5 stars > 67% 5 stars > 60% 4.5 stars > 53% 4 stars > 46% 3.5 stars > 39% 3 stars > 32% 2.5 stars > 25% 2 stars > 18% 1.5 stars > 11% 1 star > 4% 0 stars > 0 - 4%
Office buildings (whole building)	Recycling rate of any waste stream from the building that can be reliably measured (see section 3.1.2 for definition of reliably measured)	6 stars > 84% 5.5 stars > 76% 5 stars > 68% 4.5 stars > 60% 4 stars > 52% 3.5 stars > 44% 3 stars > 36% 2.5 stars > 28% 2 stars > 20% 1.5 stars > 12% 1 star > 4%

		0 stars > 0 - 4%

Benchmarks for further building types will be developed as NABERS has access to information.

2.2 Building type definitions

2.2.1 Office buildings

A workplace primarily used for administrative, clerical and similar information-based activities, including the use of office support facilities. The typical office building usually includes a ground floor café, so for the purposes of a Waste rating up to three small retail premises can be included in the boundary of the building. The rating also covers any spaces on the property provided for sole use of office building occupants (e. g. a restricted courtyard attached to an office tower).

If the office building has more than three small retail premises on it then it is deemed to be a mixed-use building.

2.3 Mixed-use buildings

In the case of mixed use buildings, such as a building with offices and more than three retail premises, then the “legal boundary” relates to the area of building use related to the type of rating as per section 2.2 (e. g. NABERS Waste Rating for office buildings only considers waste generated in the office section of the building). Proper procedures should be put in place to separate waste data per building type when uploading data to the platform, by ensuring only bins that come from the office section of the building are recorded in data and audits.

If this is not possible, then NABERS will allow retail waste to be included in the Office rating. The reason that separation was not possible must be documented by the assessor.

2.4 Precincts

NABERS prefers to rate single buildings to ensure the rating reflects the operational efficiency of individual buildings, however we acknowledge this may not always be possible for the Waste rating due to the waste dock design. For precincts the following should be applied, in order of feasibility:

a) Each building is rated separately.

b) The minimum possible number of combined buildings are rated as a single entity. For example, a precinct with 6 office buildings may be able to be allocated to two discrete docks in the precinct. In this example bins from buildings A, B and E use the first dock and would get a combined rating, and C, D and F that use another dock would get a different combined rating.

c) The entire precinct is rated as a single entity.

For situations 2 and 3, the assessor must record why the preferred option is not possible, and what steps the precinct is taking to trial individual building allocation in the future, e. g. tagging bins that are removed from specific buildings.

The mixed-use rule (section 2.3) applies to buildings in a precinct.

This concept only applies to the Waste Rating. For other ratings, if you encounter a scenario which requires multiple buildings to be included in a single rating, contact the National Administrator for approval.

3 Waste types

The Waste Rating is calculated from operational waste generated within the boundary of the building and measured as it leaves the boundary of the building as defined in section 2.2.

Specific waste streams (core items) must be included if they are generated onsite, to ensure a robust and meaningful rating is calculated. Other waste streams (optional items) are included where a building collects that material. These optional waste streams can improve the overall recycling rate, so a building is encouraged to include verifiable data for these types when seeking a waste rating.

3.1 Waste types by rating scope

The NABERS Waste Rating for Commercial Buildings rates buildings in two categories:

a) Whole building – All waste streams leaving the building that can be reliably measured;

b) Base building – Only those waste streams that are managed by the building owner or manager.

The reliability of the data and contract arrangements determine whether a waste stream is in scope for a particular rating type.

Assessors are encouraged to seek advice from the National Administrator if they are unsure a whether a waste stream meets the requirements for a rating type.

3.1.1 Managed waste streams

A waste stream that is managed by the building owner or manager is one where they have a direct contract with a company to manage that waste stream. A stream is not considered to be under base building management if it is managed by a separate team within the building management company that is specifically contracted to manage tenants. Specifically, where these teams function as two independent companies (with different ABNs) then they are deemed to be different organisations for the purpose of the managed waste streams section of the base building rating.

The exception to this is general waste. Any waste stream deemed to be general waste in section 3.2 must be included to ensure a fair rating.

3.1.2 Reliably measured waste streams

Waste streams that are not managed under a direct contract with the building owner or manager can be included in a whole building rating where the stream is reliably measured. This means the assessor is confident the data is as reasonable as other data provided for building managed wastes.

3.1.2.1 Secure paper from office buildings

Secure paper in office buildings is often difficult to reliably measure as it has specific criteria for collection and handling due the sensitive nature of the contents of the bins.

To include secure paper in a whole building rating refer to *Appendix B: Secure Paper Measurement Protocols* for measurement methods approved by NABERS. Contact the National Administrator if you wish to propose an alternate method for secure paper.

3.2 Core waste types

Core waste streams are required to be reported in the waste rating. These streams are listed in Table 3.

Where a building has services for these waste streams, they must—

a) Set up the platform for these waste streams by configuring the appropriate bin services, and

b) upload 12 months of data for each listed bin service to the Waste Manager platform before the rating can be assessed.

A NABERS Accredited Assessor must conduct a site visit to—

1) verify that all core waste types generated onsite are correctly configured on the platform,

2) confirm the building is configured on the platform to represent its operation, and

3) understand on-site waste practices to make an assessment of the validity of the waste data.

Table 3: Core waste types

Waste stream	Listed on the platform as	Description
General waste	General waste	Landfill waste or putrescible waste, this includes waste going to an alternative waste treatment facility.
	Dry waste	Waste which will not rot, decay or disintegrate over time and has little or no moisture content, can also be described as inorganic or non-biodegradable waste. This waste stream is assumed to be recovered via PEF, so if it is not then this must be correctly allocated during the rating, as per section 4.4, and must also meet section 4.3.

Mixed recycling	Mixed recycling	Also referred to as co-mingled recycling, capturing commonly identifiable recyclables. The bin usually has a yellow lid, and usually contains— a) paper, b) cardboard, c) glass containers and bottles, d) aluminium, tin and steel cans, e) hard plastic bottles and containers. For clarification of what can be included contact the waste contractor responsible.
	CDS mixed recycling	Mixed recycling separated to the point it will be accepted by a Container Deposit Scheme
Paper / Cardboard	Paper & cardboard	A mixed paper and cardboard stream only, containing loose paper, and loose and compacted cardboard. e.g. office paper, newspaper, boxes
	Cardboard (compacted)	Cardboard only stream that is compacted into bales.
	Paper	Loose paper only stream. e.g. office paper, newspaper. Does not contain paper with any plastic content (e.g. coffee cups).
	Cardboard	Loose cardboard only stream.
Organics	Organics	Compostable waste, e.g. food waste, compostable packaging. Can include some green waste, e.g. office flowers, but any bins that are primarily green waste should be listed under that stream.
Plastics	CDS plastic containers	Plastic containers separated to the point they can be accepted by a Container Deposit Scheme.
Glass	Glass	Glass only waste stream, e.g. bottles, jars.

	CDS Glass bottles	Glass bottles separated to the point they can be accepted by a Container Deposit Scheme.
	Crushed glass	Glass which is crushed prior to being weighed and picked up.
Metals	CDS aluminium cans	Aluminium cans separated to the point they can be accepted by a Container Deposit Scheme.
Composite	CDS cartons	Cartons separated to the point they can be accepted by a Container Deposit Scheme.

3.3 Optional items

The Waste Manager platform allows for the measurement of 51 waste streams, any of these streams can be included in the Office Building Waste Rating. If the building is configured to have bins for these waste types and data is uploaded to the platform, and is not excluded under section 3.4 of these rules, it will form part of the rating calculation. The inclusion of these items will improve the recycling rate, so the inclusion of these items is encouraged.

The waste streams listed in Table 4 are those most likely to be collected by an office building. A full list of waste types is available on the NABERS website.

Table 4: Optional waste types

Waste stream	Description
Secure paper	Confidential paper documents which need to be disposed of securely.
Paper towel	Hand towels/paper towels from bathrooms.
Green/garden waste	Garden organics, not food scraps. e.g. sticks and twigs, leaves, flowers, grass clippings, weeds and shrubs.
Soft plastics	Plastic that can be easily scrunched into a ball, e.g. plastic packaging, plastic bags.
Polystyrene	Expanded polystyrene.
Cooking oil	Any type of oil used in food preparation.
Food donations	Food donated to charities, from normal operations of the building, that would otherwise end up in a general waste stream. Does not include food donations sourced from occupants of the building as part of a philanthropic activity.

e-waste	Equipment that requires an electrical cord or battery to operate. e.g. televisions, whitegoods, phones, computer equipment, printers, light fittings, etc. Must meet the rules for operational waste.
Batteries	Any type of battery, except lead acid batteries from vehicles or similar. These batteries are hazardous waste and should be collected through an approved takeback scheme.
Mobile phones	Mobile phones collected through a reputable mobile phone recycler or donated to a charity.
Light globes/tubes	Any lamps or tubes for example compact fluorescent lamps, fluorescent tubes, LED lamps etc.
Printer cartridges	Inkjet and laser cartridges, toner bottles, drum kits, fuser kits, fax photocopier or printer cartridges.
Coffee cups	Disposable coffee cups only with lids going into mixed recycling.
Coffee pods	Recyclable coffee pods collected as part of a dedicated product stewardship or takeback scheme. Must be returned through a dedicated closed loop process.
Pallets	Heat treated wooden pallets (identified by an International Plant Protection Convention or IPPC stamp), or untreated wooden pallets. Chemically treated pallets are not accepted as recycled in the rating.
Scrap metal	Scrap metal is the combination of waste metal, metallic material and any product that contains metal that is capable of being recycled.
Hard waste	Waste created from the wear and tear of miscellaneous equipment and furniture. Items in this waste stream must meet section 3.4.

Additional operational waste types may be added. To request a new waste type, contact the National Administrator. There is a significant lead time on reviewing requests and adding a new waste type.

3.3.1 How to treat some specific waste types

3.3.1.1 Coffee pods

Coffee pods can be included in the recycling rate if they are:

a) Part of a take-back or closed-loop recycling scheme, such as the Nespresso product stewardship scheme. Under this criteria Nespresso branded pods can be included where they are sent back to Nespresso. Other schemes can be included where evidence of similar complete recycling outcomes for the packaging and coffee grounds is provided.

b) Contents are separated on-site with the coffee grounds being put into the organics collection, and packaging going to an appropriate waste stream.

3.3.1.2 Food donation

Food that is donated to charitable services can be included in the rating. The food must be generated from normal operations in the building, such as an on-site catering service, including corporate functions hosted on-site. Food generated through employee engagement activities such as a food donation drive cannot be included.

As the weight of materials collected through this service is minimal compared to Total Materials Generated, a monthly report of weight of food collected from the site can be used for the rating.

3.3.1.3 e-waste/Mobile phones

e-waste and mobile phones can be included in the recycling rate if they are supplied to a licenced recycler or donated to a registered charity.

3.3.1.4 Coffee cups

A dedicated disposable coffee cup collection can be included as part of the recycling rate where the waste collector has a contract in place with a facility that can recycle plastic lined cups. The assessor must be able to provide evidence of this.

3.3.1.5 Pallets

Pallets may be included if it can be confirmed that the pallets are free from chemicals and safe for recycling or reuse. This can be done by checking the International Plant Protection Convention (IPPC) stamp. Although domestic and single use pallets may not have a stamp, they are generally deemed safe for recycling or re-use and can be included. Chemically treated pallets, or pallets constructed from MDF are not accepted as recycled in the rating.

3.3.1.6 Container Deposit Schemes (CDS)

NABERS supports container deposit schemes as being a good option for improved resource recovery. A number of waste streams have been setup on the platform to enable this waste stream to be captured. They are all labelled with CDS. As the CDS operators count the number of items received by the scheme, and not the total weight or volume, then any data input to these waste streams must come from on-site measurements. Scheme operator densities or conversion factors are currently not accepted by NABERS, as per section 4.5.

3.4 Exclusions from the rating – office buildings

The purpose of the rating is to fairly compare operational waste from building to building. To meet this objective the following waste streams are excluded:

a) Waste that is not part of the day-to-day operation of the building, including construction and fit-out waste, or any items brought onto site as part of employee engagement philanthropic campaigns (e.g. food drives or clothing collections).

b) Waste generated from non-office space, such as retail tenancies within the building beyond the threshold defined in section 2.2.1. If non-office waste cannot be separated due to building operation, then refer to the mixed-use building section (section 2.3).

c) Any waste type listed as clinical or hazardous on the waste platform.

3.5 Confirm on-site waste practices

As part of their rating assessment, a NABERS Accredited Assessor must conduct a site visit to:

a) Confirm the waste platform configuration represents the actual operation of the building;

b) Confirm all core waste types collected from the premises are set up on the platform;

c) Understand on-site waste practices to assess the reasonableness of the waste data;

d) Count bins collected and tally empty bins.

This site visit can be conducted at the same time as any planned audits.

4 Calculating the recycling rate

This section sets out:

a) Waste measurement requirements.

b) How the NABERS Waste Manager Platform calculates total weight of materials and total weight of recyclable materials to determine the rating.

$$RR(\%) = \frac{Total\ Recovered\ Materials\ (kg)}{Total\ Materials\ Generated\ (kg)}$$

Total Materials Generated is the mass, measured in kilograms, of the contents of every bin, compactor or other waste vessel that leaves the site.

Total Recovered Materials is the sum, in kg, of the contents of every bin, compactor or other waste vessel that leaves the site EXCEPT any bin, compactor or other waste vessel which contains waste sent directly to landfill. This figure is adjusted through a contamination rate (see section 4.11).

4.1 Data requirements

A Waste Rating requires data for every container of operational waste collected from a building. This data can either be:

a) The weight of the contents of the container; or

b) A count of the number of containers collected.

Data is required per collection, per waste stream, per equipment type and size. The data template for the rating is available from the NABERS website.

A Waste Rating requires data for a minimum of 90% collections in a 12 month period for each core waste type identified as generated on-site.

Data can be sourced from:

1) Building cleaning contractor;

2) Waste Contractor;

3) Security contractor;

4) Waste consultant.

4.1.1 Primary data source

The primary data source for each bin service is the source used to generate the 12 months of data required for the rating. A rating may have different primary data sources for different waste streams.

4.2 Point of measurement

The Waste Rating rates the building as a whole system. This means building managers and cleaners can improve the quality of materials generated by tenants of the building before those materials are collected by a waste management company. For this reason the rating measures waste as it leaves the building. Specifically, the rating measures waste as presented for collection. This is the point in the building's waste management process at which bins or other equipment are presented ready for a waste truck to collect.

Weight measurements and bin tallies must be taken at, or just prior to, this point in the process, so that the weight reflects what actually ends up in the waste truck.

4.2.1 Non-standard point of collection

For most buildings it is simple to identify the point of collection and ensure measurements are taken at this stage in the process. However, in some buildings, especially mixed-use, it is less straightforward. In these cases a process map, or procedure for handling waste may be used to determine an appropriate point of measurement.

Contact the NABERS administrator to confirm that the point of measurement is correct for the rating.

For waste management processes that are not collected by a truck the following data collection points apply:

For the following situations the point of collection is defined as the point bins are emptied into the machine:

a) On-site bio-digester that is emptied through a trade waste outlet;

b) Pulpmaster;

c) Dehydrator;

d) On-site organics treatment unit that is owned and operated by a third party, including the removal of any products of the unit.

4.3 Energy from waste

In keeping with the waste hierarchy NABERS will allow waste streams that are sent to a licenced facility for the purposes of creating energy to be included in the recycling rate calculation. However, these waste streams must meet one of the following criteria:

a) Must be an anaerobic digester;

b) Must be a bio-mass based waste stream;

c) If the waste stream contains plastic, then the weight of plastic in the stream must be less than 14% of the total. A composition audit can be used to demonstrate this outcome;

d) The waste is being used to replace a more carbon intensive fuel source, e.g. dry waste used in a cement kiln to replace coal.

Any waste stream, except anaerobic digestion that meets these criteria must be have sufficient evidence to generate a building specific value for the Material Recovery Score, and must choose the option “burnt” as the recovery pathway.

If a waste stream does not meet these criteria then it must be allocated as “landfill” on the ratings page.

4.4 Waste streams sent to landfill

The NABERS Waste Rating assumes that all wastes listed as General Waste on the platform are sent to landfill, and that all other waste types are not. This assumption is fundamental to the rating calculation.

The platform allows data for specialist collection waste streams to be uploaded for the Whole Building rating. However not all waste types that are available on the waste platform are able to be recovered in all regions in Australia. A building may collect a waste type and upload this data to the platform for their reporting purposes, but the materials are not actually recovered. These waste streams must be allocated as landfill, not recycling.

Where an assessor has concerns that a waste stream is not being recovered for beneficial re-use as per the waste hierarchy, they must confirm with the waste contractor that the material has been collected and taken to either:

a) A recovery or reprocessing facility;

b) A transfer station;

c) A materials recovery facility;

d) A registered charity.

If there is no evidence that the waste stream is collected and taken to one of these destinations, or the assessor has reasonable doubt that it has instead gone into landfill, then they must indicate this on the rating page, so the waste can be correctly allocated under the rating.

4.5 Summary of waste measurement methods

Table 5 describes, in order of rigour (most accurate to most estimated), the weight calculation methods allowed for in a rating. Ideally a Waste Rating is calculated from actual measurements of the weight of material collected. Alternate methods allow for a bin count to be multiplied by an actual or average density of materials for a bin service to determine an approximate weight. The data for a particular bin service can be a mix of the three methods listed in this section.

When calculating a rating, the data platform applies a data quality factor to collections that use methods other than the measured weight method (see section 6 for more information on the data quality adjustment).

The platform automatically determines which method has been used based on uploaded data. Different methods can be used for different waste types, and within a single waste type.

NABERS does not accept a calculated weight for any collection. Weight values are only accepted where the bin or other container has been measured on scales. For instance do not report a weight by multiplying bin count by a density factor, and check that any waste company reports are not performing this calculation prior to data being uploaded to the platform. Section 6.2.1 has more detail on how assessors must check for this situation.

Table 5: Weight calculation methods

Method	Method description
Actual weight	Bins collected from the site are weighed by properly calibrated scales, either onsite, on-vehicle or at the waste facility.
Site specific density with number of bins	Number of bins collected from the site is tallied, but not weighed. A least one density audit is conducted to calculate a density factor for a bin service. One of these audits must be completed by an accredited assessor.
NABERS standard density with number of bins	Number of bins collected from the site are tallied, but not weighed. No site-specific density audit is conducted. A NABERS standard density is used to determine weight

The remainder of this section sets out how weights are calculated. Appropriate evidence is required to verify that the methods listed in section 4.5 have been applied correctly.

4.6 Method 1: Actual weight measurements

Actual weight means that a bin, as presented for collection from the site, is weighed prior to, or during, collection. The recorded weight must be the contents of the bin only, the weight of the equipment must be removed from the measurement.

Actual weight does not mean “agreed weights” or any other calculations to determine a weight for the bin.

Weight measurements might be recorded via:

a) On-site scales used to weigh bins prior to collection;

b) The waste contractor’s on-vehicle scales;

c) Use of weighbridge – acceptable for compactors and other large containers only;

d) On-site equipment with built in scales. Readings can be taken from a visual display, once per operational day, at the same time every day.

Table 6: Weight calculation method 1 - Actual weight measurements

Step	Procedure
Required Data	Weight of each bin collected from site
Data Source	Waste contractor report Report generated from on-site scales
Calculation	The platform generates a sum of individual bin weights to determine the total weight. *Total weight = Σ bin weights*
Evidence	Evidence to verify weights uploaded to the platform. Any one or more of the following: a) Receipts recording individual bin weights and size; b) Waste contractor invoices; c) Cleaner bin tallies; d) Automated bin readers; e) Weighbridge dockets; f) Evidence of scale calibration to appropriate standards.

All weighing devices used must be supported by evidence of calibration tests conducted at least annually. The scale increment must be appropriate to the quantum of waste being weighed, e.g. a scale used to measure a mobile bin should register to the nearest kilo.

During the site visit the assessor must observe the weighing procedure to confirm its reliability (Refer section 6.2.1).

4.6.1 Mandatory actual weights

Bin densities for the following waste streams can vary substantially, so NABERS has determined that a density calculation method is outside an allowable error for a rating. If the following waste streams are reported for a NABERS rating, then actual weights are required. Density methods (method 2 and 3) cannot be used.

- e-waste
- Printer cartridges
- Light globes and tubes (lamps)
- Batteries
- Green waste
- Food donation
- Paper towel
- Mobile phones

- Coffee cups
- Coffee pods
- Pallets
- End of life products
- Scrap metal
- HDPE
- PET
- Polypropylene
- Hard waste.

4.7 Method 2: Site specific density with bin numbers

This method is the preferred option when actual measured weights cannot be provided. Site-specific waste densities and bin volumes are used to calculate bin weight.

Table 7: Weight calculation method 2 - Site specific density with bin numbers

Step	Procedure
Required Data	Count of bins collected from the site A site-specific density rate calculated by either: a) Density data collected through an audit (see section 5.10 for details): 1) Weight of an empty bin, or the average of a number of empty bins; 2) Total weight of bins for each bin service (or a sample if bins exceed 25 in total). b) Calculating the density from weight values. (see section 4.7.1 for details).
Data Source	Bin count: a) Waste contractor report; b) Report generated from on-site cleaner bin tally. Density data: Audit information
Calculation	The platform generates a sum of individual bins multiplied by site-specific density for that bin service to determine the total weight. The platform also calculates the density from the audit input page. *Total weight = bin count x bin volume x density*
Evidence	Evidence to verify data uploaded to the platform. Any one or more of the following: a) Receipts recording bin numbers picked up and size; b) Tally of bin numbers picked up by size. At least one site density audit.

One site-specific density audit is required under this method during the rating period, or up to 120 days after the rating period. If multiple site audits are carried out, the NABERS platform applies the average of all audits uploaded to the platform. Note the data quality rules require a minimum of two density audit values to achieve a good data quality score for this method (Refer section 6.1).

Site density audits for a NABERS rating are required to be completed separately for each bin service. For example, if you have a mixture of 240L and 660L bins for cardboard at your dock, then audit results are required for each bin size.

See section 5.10 for density audit methodology.

4.7.1 Calculating a site specific density value from existing weight values

Where a bin service has weight values for 50% or more of collections, and these collections have passed section 6.2.1 of these rules then site-specific density figures to meet the requirements for a good data quality level can be calculated as follows:

a) Download data on all collections for that bin service in the rating period (can be accessed from the dashboard on the Waste Manager platform).

b) Find the first full 30 day period with weight values in it and the last full 30 day period with weight values in it, that comply with section 5.5 of these rules.

c) Calculate the total weight of collections in these periods and also the number of bins that were collected.

d) Determine the weight of a single bin as per step 3 of section 5.10.

e) Input that data to the audit page on the Waste Manager platform, using the end date of the 30 day period as the “date of the audit”.

4.8 Method 3: NABERS standard densities with bin numbers

When measured weights cannot be provided and site-specific waste densities are not available, NABERS will use its standard densities to calculate the weight of material collected.

Table 8: Weight calculation method 3 - NABERS standard densities with bin numbers

Step	Procedure
Required Data	Count of bins collected from the site
Data Source	Waste contractor report Report generated from on-site cleaner bin tally
Calculation	Sum of individual bins multiplied by NABERS standard density for that waste type to determine the total weight. *Total weight = bin count x bin volume x density*
Evidence	Evidence to verify data uploaded to the platform. Any one or more of the following:

	a) Receipts recording bin numbers picked up and size; b) Tally of bin numbers picked up by size.

4.9 Non-standard measurement methods

4.9.1 Secure paper

Data for secure paper bins is often difficult to collect as these bins are managed separately to other waste streams due to the sensitive nature of the contents of the bin.

Where it is not possible to weigh each bin prior to collection, or to obtain a reliable bin count refer to Appendix B: Secure paper measurement protocols.

4.9.2 Pulpmaster™ machines (additional section)

NABERS has determined that additional water added to this machine is negligible and so it does not need to be accounted for. If the measurement method complies with methods described in section 4.5 to 4.8 inclusive, then it is acceptable for the rating.

Where Method 2 is used to determine weight values (refer section 4.7) a bin count is used as the measurement method, then a minimum of four density measurements must be made during the rating period in order for the service to achieve a data quality rating of “good” (refer section 6.1).

4.10 Data completeness for a rating

A Waste Rating requires data for a minimum of 90% of collections in a 12 month period for each core waste type identified as generated on-site. This requirement reflects real world conditions where bin collections are not uniform across 12 months.

A data completeness check is performed by the platform against NABERS standard minimum collection frequencies for each possible bin service configuration. If insufficient data is available on the platform then the rating cannot proceed. This check is only applied to core waste streams.

4.10.1 Adding a waste stream during the rating period

A new bin service can be added during a rating period, where this waste was not previously collected in the building, or the equipment type is changed (e. g. a new bin size). The assessor should contact the National Administrator where new waste streams were added during the rating period to request that the rating proceed. Evidence of changes to bin services, such as contract variations or emails must be supplied.

4.10.2 Missing data

Where less than a full data set is supplied NABERS will not compensate for the missing data. The NABERS Waste Rating Method does not allow for interpolation of data by an assessor where data is missing.

4.11 Adjusting the weight for contamination

A contamination rate for each bin service is applied to data uploaded to the platform. This rate adjusts the calculation to determine a true value for the recycling rate by determining the weight of materials in the recycling stream that are sent to landfill by a waste company. This weight is subtracted from the Total Recovered Materials.

The contamination rate is determined through one or more contamination audits, with the average used to determine the contamination rate.

$$Contamination\ Rate = \frac{\sum weight\ of\ contaminated\ items\ (kg)}{\sum weight\ of\ bin\ contents\ (kg)}$$

The following waste streams will not have a contamination adjustment applied to them:

- General waste
- Secure paper
- Green waste
- e-waste
- Batteries
- Mobile phones
- Light globe/tubes
- Printer cartridges
- Coffee pods
- Food donation
- Crushed Glass
- Cooking oil
- Pallets
- Scrap metal
- Hard waste

5 Waste audit methods

5.1 Overview

The NABERS Waste Rating uses three types of audits to improve the rating's accuracy: an audit of contamination rates for recycling streams, a bin density audits to determine site specific weight values, and a composition audit to determine material splits for mixed waste bins. The first two audits increase data certainty for a specific building, which improves the data quality score for a waste rating. The third one increases the accuracy of the Material Recovery Score for a building.

None of these audits are required for a rating, NABERS will apply standard values if an audit is not completed for a relevant bin service. However, this has repercussions for the rating results.

NABERS strongly advises all buildings to complete at least one audit of each type for each bin service, conducted or supervised by an Accredited Assessor in each rating period, and an additional density audit completed by someone trained in audit procedures. Data quality corrections will be applied to any bin service that has not had at least one of each audit type conducted during the rating period. See section 6 for data quality rules.

Additional audits can be completed throughout the rating period to improve data accuracy. The average results of audits uploaded to the Waste Platform will be applied to the building's waste data.

Audits are conducted on bins as presented for collection. This means that a building can perform any operations it deems appropriate to sort or consolidate its waste prior to collection. The Waste Rating assesses the efforts of the building as a whole, not the behaviour of tenants, and good waste management practice may include cleaners removing obvious contamination from bins.

5.2 Types of audit

A contamination audit is an audit of one day of materials generated on-site for a specific bin service of any waste stream that is not going to landfill. The purpose of this audit is to ensure materials recorded as recycled by a building are being diverted from landfill by the waste contractor, based on their standard procedures. NABERS does not require a contamination audit of any waste type going to landfill (sometimes known as an opportunity or a leakage audit).

The density audit is an audit of one day of materials generated on-site for a specific bin service where weight data for that service does not exist. The purpose of the density audit is to get a better estimate of the weight of every bin collected from the building, including bins going to landfill.

A composition audit is an audit of one day of materials generated on site for a specific bin service for any waste stream that is not going to landfill. The purpose of this audit is to determine building specific material splits for the Material Recovery Score calculation (refer section 7), and should only be completed if section 7.2X2 has been met or is likely to be met, otherwise building specific values for mixed bin material composition cannot be used. It only needs to be completed on bins with mixed contents where those contents will have different material recovery values.

For the remainder of this section “an audit” refers to any of these methods for a specific bin service.

5.3 Waste streams by audit type

Some waste streams are excluded from a particular type of audit, usually because the contamination rates for that waste are very low, or the rating requires a weight to be entered on the platform (see section 4.6.1).

The following table indicates whether a waste stream should be audited for either contamination or density for the rating. Composition audits have not been included in this table, as most bins will not need to be audited.

Table 9: Audits by waste type

Waste type	Stream auditable for:		Reason (if no)
	contamination?	density?	
General waste	No	Yes	There is no contamination in waste streams that go to landfill
Mixed recycling	Yes	Yes	
Paper & Cardboard, (all variants)	Yes	Yes	
Secure paper	No	Yes	Typically low contamination and difficult to audit
Paper Towel	Yes	No	Paper towel compaction rates are not standard
Organics	Yes	Yes	
Green/garden Waste	No	No	Low contamination and difficult to audit; Rating requires weight calculation
Food donation	No	No	

Soft Plastics	Yes	Yes	
Dry Waste	Yes	Yes	
e-waste	No	No	Typically very low contamination; Rating requires weight calculation
Batteries	No	No	Typically very low contamination; Rating requires weight calculation
Mobile Phones	No	No	Typically very low contamination; Rating requires weight calculation
Light globes/tubes	No	No	Typically very low contamination; Rating requires weight calculation
Coffee cups	Yes	No	
Coffee pods	No	No	Typically very low contamination; Rating requires weight calculation
Printer Cartridges	No	No	Typically very low contamination; Rating requires weight calculation
CDS - all streams	Yes	Yes	
Crushed glass	No	No	Typically very low contamination; Rating requires weight calculation
Glass	Yes	Yes	
Cooking oil	No	Yes	Typically very low contamination and difficult to audit
Polystyrene	Yes	Yes	
Scrap metal	No	No	Typically very low contamination; Rating requires weight calculation

Hard waste	No	No	Typically very low contamination; Rating requires weight calculation
Pallets	No	No	Typically very low contamination; Rating requires weight calculation

5.4 Who can complete an audit?

Audits can be completed by suitably qualified and trained individuals at the discretion of the building manager. An accredited NABERS Assessor must be physically present at a minimum of one contamination and density audit for the data quality adjustment (see section 6), and one composition audit for MRS results.

Any audits not completed or supervised by a NABERS Assessor must be checked by a NABERS Assessor. The NABERS Assessor must confirm that correct procedures were followed (e. g. used a weight-based method, not a visual assessment method) and the results are in line with what would be reasonably expected. If the NABERS Assessor finds any issues with the procedures or results, the audit will be deemed unacceptable and cannot be used for rating purposes.

5.5 When can an audit be completed?

Audits can be conducted on any normal operating day within the 12 month rating period, or up to 120 days after the end of the rating period. An audit conducted in the 120 day period may be re-used in a subsequent rating where it falls within that rating period.

The Assessor does not have to complete an audit of every bin service or every waste stream on the site on the same day. However, an audit of an entire single bin service must be completed in a single day. Contamination and density audits do not have to be completed at the same time, but is advised for efficiency.

The audit must reflect normal operating conditions in the building. To increase the likelihood of this, the audit must be conducted on a normal operating day.

The only people that should be notified of the audit date are those who are necessary for the safe and smooth operation of the audit. For instance, building managers to arrange access to the site, cleaning manager to advise when bins are finalised and when the waste contractor usually arrives, and potentially the waste contractor if extra time is needed to conduct the audit.

5.5.1 Normal Operating Conditions

The Assessor must confirm that the day of auditing will be a normal operational day for that property. A normal operational day is a day where the occupancy is representative of the average occupancy of the rating period. Confirmation from the operators or managers of the property is required to fulfill this requirement.

The following periods are unacceptable for conducting any type of waste audit:

a) Two weeks before or after the end of the financial year;

b) Public holidays and public school holidays relevant to the location of the building;

c) During January;

d) In the last two weeks of December;

e) Any other unusual operating day.

If occupancy has reduced, the Assessor must confirm with building management that waste services have also been reduced in line with the occupancy reduction. This will ensure that the bins maintain a viable level for auditing. If the Assessor determines that the volumes of waste are too small to give accurate results, they must not include those results in the rating.

If there is any uncertainty regarding volume of waste and/or reduction of occupancy, contact the National Administrator.

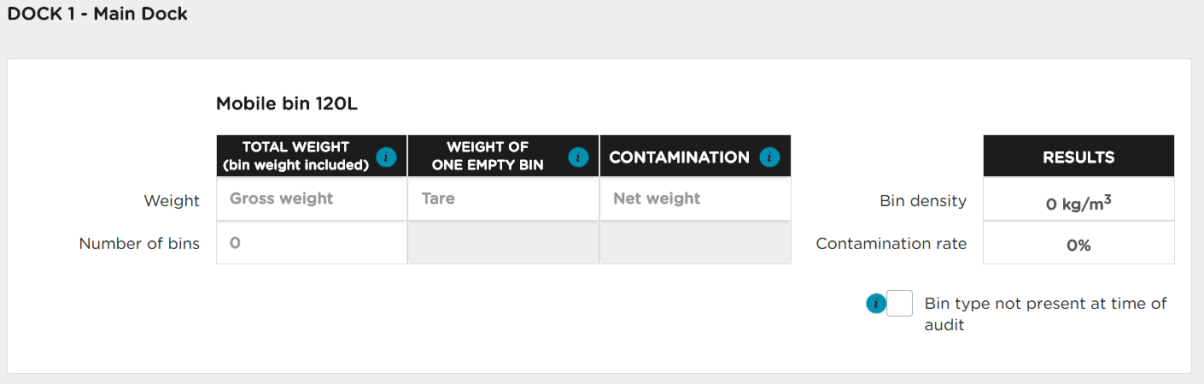

Figure 3: Audit input screen

Note: To ensure the accuracy of a density audit, review the bins presented for auditing against the data from earlier collections to confirm it is representative. This will ensure that the density applied to the annual data is as accurate as possible. For contamination audits, ensure that there is sufficient waste present to give a representative result. Examples of abnormal operational days could be a property undergoing large construction works, tenant relocations or major maintenance works.

5.6 Data required for audit calculations

5.6.1 Contamination and density audits

The platform calculates the contamination and density rates when the following information is uploaded to the platform (per bin service):

a) Sum of the weight of all bins (Gross weight)
b) Weight of an empty bin, or the average weight of a number of empty bins (Tare)
c) Sum of total contamination (Net weight)
d) Number of bins weighed during the audit.

Sections 5.9 and 5.10 set out the audit methodology to determine these figures.

Results are displayed in the results table. The platform applies the results to waste collection data once the audit is saved in the following way:

1) If a rating is generated then any audits that occur during the rating period, or within 120 days after the end of the rating period are applied to waste collection data.
2) When the platform dashboard is set to a specific date range then any audits that occur during that time period will be applied to the collection data. If a building wishes to use the platform as a reporting tool (and not just for rating purposes) then more frequent audits are encouraged for data reporting consistency.

5.6.2 Composition audits

Results for composition audits are calculated using the NABERS Waste calculation spreadsheet. The following information is required:

a) Sum of the weight of all bins;
b) Weight of an empty bin, or the average weight of a number of empty bins;
c) Sum of total contamination;
d) Sum of total weight of all identified material streams;
e) Number of bins weighed during the audit;
f) Date of the audit and name of the person who conducted the audit.

5.7 Audit stages

a) Plan and organise the assessment.
b) Undertake a site visit to conduct quantitative measurements and audit.
c) Collate data.
d) Enter relevant data into the NABERS Waste Platform.

5.8 Planning an audit – contamination and density

5.8.1 Steps

Prior to commencing an audit, the NABERS Assessor should:

a) Confirm client requirements, and ensure they understand NABERS audit procedure requirements.

b) Gather preliminary data about the building and its waste.

c) Arrange a suitable audit date and time with the building manager. Select a normal operating day, when all waste type to be audited are collected. See guidance on "Normal Operating Day" for a commercial building (section 5.5.1).

d) Secure access to the building. Consider that most bins are removed from floors and collected by the waste contractor after business hours, so this may require special access.

e) Produce a pre-work safety assessment.

f) Ensure scales are calibrated appropriately and evidence of calibration is kept.

5.8.2 Required preliminary data

Table 10: Preliminary audit data

Source of data	Data type
From platform:	• waste types in the building • waste contractor(s) used for each waste type • bins types, sizes and number of bins for each waste type
From building contact:	• contact details for waste contractor • collection timing/frequency for all bins
From waste contractor:	• collection/drop-off facilities
From waste contractor or designated waste facility:	At time of audit: • materials accepted as recyclable and materials considered to be contaminants in each waste stream Where the waste contractor and waste facility disagree on which items are considered to be contamination, then, for the purposes of consistency in the rating, the waste collector's information takes precedence.

5.8.3 Representative Sample

The following sampling method applies to sites with a large number of bins in a single waste stream.

If a single waste stream has more than 25 bins, then apply the Slovin's Formula to determine the total number of bins to be audited. The Slovin's Formula is:

$$n = \frac{N}{1 + Ne^2}$$

where *n* is the sample size, N is the population size and *e* is the margin of error.

The NABERS Waste Rating Method requires a 90% confidence interval to be used, so e is 0.1. The results should be rounded up to the nearest whole integer. If the formula provides a result of less than 25, then a minimum of 25 bins must be sampled.

Example:

Building XYZ is a large commercial tower building with 56 floors. Each floor has a small waste bin in the kitchen and 3 waste stations located around the floor. Every night the cleaners empty these bins into 240L bins which are stored in the dock ready for collection every second day. On average a floor fills up ¾ of a bin every two days, so usually 42 bins are presented for collection to the building's waste contractor.

A NABERS Assessor has been asked to do a waste density audit for the building's NABERS Waste Rating. She sees that there are more than 25 general waste bins in the dock and determines that the sampling method can be applied. Using Slovin's Formula she determines that n=29. 5, so 30 bins should be audited

$$n = \frac{42}{1 + 42 \text{ x } 0.1^{\,2}}$$

5.9 Contamination audit procedure

1) Identify recycling bins associated with all recycling streams listed at the site that are included in the data set.

   For instance:

   i) Bins from retail tenants that meet the definition requirements for an office building must be included;

   ii) Where a mixed use building has determined they cannot separate retail waste bins, then these must be included in the audit.

For each bin service (all bin sizes/equipment types for a given waste stream):

2) Weigh an empty bin and record this weight. If you have time and access to a number of empty bins then weigh a few and take the average of these bins.

3) Weigh all bins that contain materials at the point where it is collected by the waste contractor, such as at a loading dock. Record this number.

4) Separate the contaminants of each bin/receptacle and weigh them. Record this number. If items are present but the scale records the item as 0 due to its increment settings, then the weight must be recorded as the lowest possible non-zero increment.

5) Take pictures of each bin audit.

6) Verify that the information looks consistent with existing data for the site, including bin/compactor weights.

7) Upload the information to the NABERS Waste platform which will calculate the contamination rate.

Steps 6 to 7 can be performed off site.

5.9.1 Variations to the method

Variation to step 3: The contamination weight does not have to be recorded per bin, instead the assessor can consolidate the total quantity of contamination for a bin service into a single weight.

Where a site does not have a daily collection, and pickups for different waste streams occur on different days of the week, so that a single “presented for collection” day cannot be achieved, then Step 3 is amended to state that a contamination audit can be completed on a partially filled bin prior to it being ready for collection by a waste contractor. The bin must be over a third filled (estimated volume based on a visual assessment of the size of the bin). This allowance DOES NOT apply to a density audit, which must still be completed when bins are presented for collection.

5.10 Density audit procedure

1) Identify bins associated with all waste streams listed at the site that are included in the data set and use bin counts as their data source.

   For instance:

   i) bins from retail tenants that meet the definition requirements for an office building must be included

   ii) where a mixed-use building has determined they cannot separate retail waste bins, then these must be included in the audit.

For each waste type and bin size/equipment type:

2) Record the bin size (volume).
3) Weigh an empty bin and record this weight. If you have time and access to a number of empty bins then weigh a few and take the average of these bins.
4) Weigh all bins that contain materials at the point where it is collected by the waste contractor, such as at a loading dock. Record this number.
5) Take pictures of each bin audit.
6) Verify that the information looks consistent with existing data for the site, including bin/compactor weights.
7) Upload the information to the NABERS Waste platform which will calculate the density.

Steps 6 to 7 can be performed off site.

5.11 Composition audit procedure

Only complete this audit if a bin service meets requirements of section 7.2.1 (70% of collections verified) and section 7.2.4 (contents will subsequently be sorted into pathways with different Material Recovery values). The composition audit method is very similar to the contamination audit, and both audits can be completed at the same time.

1) Complete steps 1-8 of the contamination audit procedure, only for those bins that meet the requirements of section 7.2.1 and section 7.2.4.
2) Of the remaining contents, separate them into appropriate material streams, based on either information from the waste facility that receives the material, or on reasonable industry research into most likely material recovery pathways. Weigh each material stream. Record this number.
3) Take pictures of each bin audit.
4) Verify that the information looks consistent with existing data for the site, including bin/compactor weights.
5) Input the information to the NABERS Waste calculation spreadsheet which will calculate the composition percentages.

Steps 4 to 5 can be performed off site.

5.11.1 Variations to the method

Variation to step 2: The composition weight does not have to be recorded per bin, instead the assessor can consolidate the total quantity of each material stream for a bin service into a single weight.

5.12 Auditing compactors, skips and bales

Compactors, skip bins and bales present a specific challenge for on-site auditing as it is not feasible to empty a compactor or skip, or to pull apart a bale. The methods described below set out how to determine contamination rates for compactors and bales.

5.12.1 Compactor density audit

In general density audits should not be required for a compactor, as data method 1 should be the most common data option, through the widespread availability of weighbridges for waste of this size. If the contamination audit method described below is not possible at the site being audited, contact the National Administrator before lodging your rating to discuss alternatives.

5.12.2 Compactor contamination audit procedure

This method requires all waste that would normally be placed into the compactor to be audited before it is placed in the compactor. This method will require communication with the site cleaning company so relevant bins, or their contents, can be placed in a designated area throughout the day to be audited before being placed into compactor as usual.

This method describes the contamination audit method only, but can be adapted for a density audit method if weights are not able to be obtained:

1) Identify compactors associated with all recycling streams in the building.
2) For each compactor, arrange for all bins (or their contents) to be placed in a designated area throughout the day for auditing prior to being placed in the compactor.
3) There are two ways to do an audit:
    i) Option 1: Conduct an audit of each bin that would have been emptied into the compactor as outlined in the standard Contamination Audit methodology of the rules (section 5.9).
    ii) Option 2: If all waste from bins that would usually have been emptied into the compactor has been combined in one location (for instance the bins were emptied as they were needed elsewhere), record the weight of all waste and the weight of all contaminants.
4) Take pictures of each bin and the compactor, including contaminants and scales.
5) Verify that the information looks consistent with existing data for the site, including bin/compactor weights.
6) Upload the information to the NABERS Waste platform which will calculate the contamination rate.

5.12.3 Auditing baled recycling

Recycling streams that are baled can be audited with a visual assessment. Photos of all visible faces of the bale are required to justify the assessment. Persons conducting the audit are not required to pull the bale apart for an actual content weigh-off, as this presents a range of health and safety issues and creates substantial work for cleaners or the assessor to re-bale the recycling.

5.13 Auditing a bin service used as an overflow service

Where a bin service is specifically used as overflow in the case that another bin service is full (e.g. some 240L bins are reserved in case the main 660L bins are full) and so are not presented for collection on the night of the audit, then the contamination results of the main bin service can also be applied to that overflow bin service. If there is more than one main bin service, then the contamination rate of the overflow service is a weighted average of the measured contamination rate.

This exception cannot be used for density values, due to variance of contents for these bins.

6 Data quality

Waste data is not yet as accurate and trusted as energy and water bill data, and the industry is in transition from bin lifts to measured weight as the basis for reporting. This chapter sets out how NABERS Waste Manager assesses data uploaded to the platform, and instances where assessors must amend data if it fails a data verification check.

6.1 Data quality adjustment

The most accurate waste data for a rating is determined by Method 1 (actual weight of all bins collected from the site at point of collection) combined with site specific contamination rates obtained through a NABERS-assessed audit (see section 5.9).

NABERS recognises it is not always possible to provide this level of data quality for all collections. A NABERS rating can be assessed from lower quality sources, such as number of bins collected multiplied by a density for that waste type. In these cases, data for the rating is adjusted by applying a data quality factor to account for the level of confidence in the data.

The data quality categories are shown in figure 6. Data rated as excellent will be accepted as true. All other data will be weighted for uncertainty.

Data quality categories are applied to each individual waste collection, not an overall category for the data set. The platform performs the data quality adjustment, no action is required from platform users or assessors, other than to ensure the best available data is uploaded to the platform.

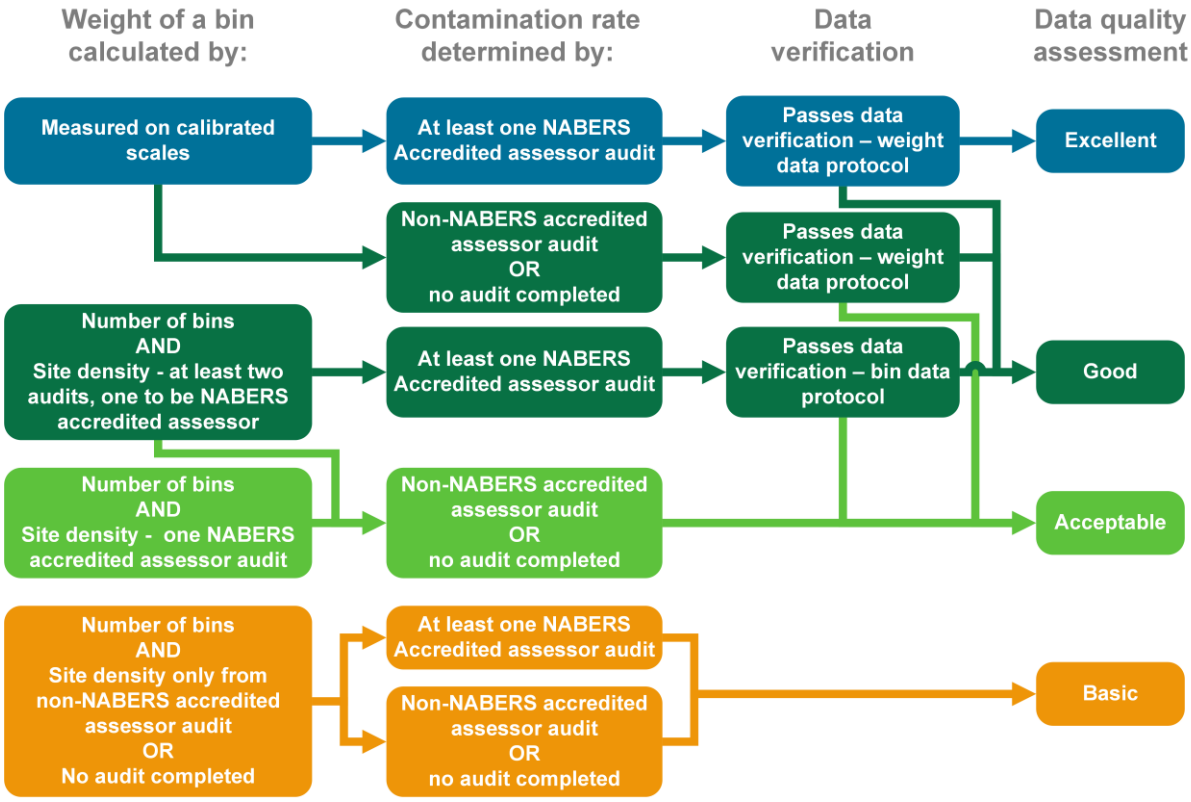

Figure 4: Data quality category schematic

The data quality adjustment is only applied at the point of rating. This means the recycling rate shown on the dashboard does not contain the data quality adjustment, so cannot be used to predict the final star rating. The star rating can only be determined once the assessor has completed all data checks.

6.2 Verifying data

For waste types with any data that is likely to be assessed as ‘excellent’ or ‘good’ under the data quality scheme (see figure 6), NABERS Accredited Assessors should perform the data quality checks as set out below. The purpose of these checks is to test the accuracy of the primary data source.

If these checks are not completed then the rating can proceed, but a data quality factor will be applied (see figure 6).

The following checks can be completed in any order, however, NABERS recommends they proceed as per this list as this will reduce workload if a waste stream does not pass the simpler checks.

6.2.1 Testing weight-based data

Some waste providers supply weight-based reporting, but the weights may not be accurate as the contractor is supplying a calculated weight based on bin lifts and a density calculation.

This situation should be tested as follows:

Test 1: Reporting agreed weights

Check whether the waste contract states that reporting can come from “agreed weights” or “agreed densities”.

If the contract contains this clause, and there is not sufficient evidence that all weight data for a bin service entered on the platform represents actual weights, then the bin service(s) does not pass the data verification check.

The assessor must delete affected weight data on the platform and re-upload those collections as just bin counts so the platform recognises the data as either method 2 or 3.

Test 2: Check for unreliable data

Table 11: Unreliable data check – weight based data

Unreliable data pattern	Data check
The same weight is collected repeatedly over the rating period	The same weight is reported 5 or more times in a single month for weights >= 25kg, or 7 or more times for weights < 25kg. This check should consider the sensitivity of the scales used to weigh the bins (refer section 4.6), and whether or not this is a reasonable pattern.
Weights reported as actual weights have repeating density factors applied	Bin density for a waste stream repeats 5 or more times across the year.

If these patterns are observed in any bin service then the assessor must either—

a) establish that the data is reliable, through evidence of on-site collection practices, or

b) delete all affected weight data for that bin service on the platform and re-upload those collections as just bin counts so the platform recognises the data as either method 2 or 3.

How to check for the listed unreliable data patterns:

The assessor must download all data for the rating period as a spreadsheet (this can be easily done from the dashboard), and perform the following steps:

1) Sort data by Waste type, then Equipment then Size to create bin services.

2) In column L copy the following formula into row 2: =I2/H2/G2 (to create the formula Bin density = bin weight / number of bins collected / bin volume).

3) Copy this formula down the column so it applies to each row.

4) For each distinct bin service:

   i) Visually check each criterion listed above where there are a small number of rows per bin service; OR

ii) Highlight data in column I (Weight picked up (kg)) and apply conditional formatting “Duplicate values”;

iii) See if any bin service meets the first unreliable data pattern listed above

iv) Highlight cells in column L (with the density factor calculation above) and apply conditional formatting “Duplicate values”;

v) See if any bin service meets the second unreliable data pattern listed above.

Test 3: Observe weighing procedure

The assessor must observe the weighing procedure in situ to determine that the procedure is likely to result in reliable weights being recorded. Practices to look for:

a) Scales are calibrated;

b) An empty bin weight has been accounted for in the recording procedure;

c) Weights are reliably recorded;

d) Bins are rolled onto scales in a way that their true weight will be recorded. i.e. all wheels are on the scales, the bin is not resting on a wall, etc.;

e) If any of these are not true during the period of observation then the building does not pass the data verification check;

f) If bin weights are generated from on-truck scales, and the truck automatically records this weight, then the weighing procedure can be checked via CCTV footage.

6.2.2 Testing bin count based data

For all waste streams included in the rating which rely on bin counts as their weight calculation method, and are listed as requiring a data verification check on the ratings page (those that meet the requirements for “good” in the data quality scores, refer figure 6), the following checks must be conducted.

Table 12: Unreliable data check – bin count based data

Unreliable data pattern	Data check
The number of bins collected on weekends or public holidays is very close to the daily average number of bins collected across the year.	Bins collected on 2 or more public holidays (or the day after if waste for a building is typically collected early morning) across the rating period are more than half the daily average for that bin service across 12 months.
The same number of bins is collected for a large portion of the year	The same number of bins collected is reported for more than 60% of collections for a bin service over 12 months
There are regularly more bins collected than listed on the platform	There are more bins reported as collected than listed in the platform for more than 20% of collections for a bin service.

If these patterns are observed in any bin service then the assessor must either—

a) establish that the data is reliable, through evidence of on-site collection practices, or

b) adjust the data on the platform to reflect actual practice, or

c) indicate this on the platform during the rating assessment by choosing “no” on the data verification check.

How to perform this check:

The assessor must download all data for the rating period as a spreadsheet (this can be easily done from the dashboard), and perform the following steps:

1) Scroll through data looking for public holidays (e.g. 1/01/2019 or 25/04/2019). See if any bin service meets the first unreliable data pattern listed above.

2) Sort data by Waste type, then Equipment then Size and then date to create bin services.

3) For each distinct bin service:

   i) Visually check each criterion listed above where there are a small number of rows per bin service; OR

   ii) Highlight data in column H (units collected) and apply conditional formatting “Duplicate values”;

   iii) See if any bin service meets the second unreliable data pattern listed above;

   iv) Remove formatting;

   v) Highlight cells in column H (units collected) and apply conditional formatting “Greater than” and apply the number of bins configured on the platform for that service;

   vi) See if any bin service meets the third unreliable data pattern listed above.

6.2.3 Testing an independent data source

For a given bin service that meets the criteria to be assessed as “excellent” or “good (refer figure 6), the Assessor needs to check the primary source of data (defined in section 4.1.1) with a secondary one, for a full month, for every collection on that month. The second data source must be an independent count of the number, size and type of bins presented for collection each day. Bin count data is a mandatory field, in addition to weight data, so will be available to the assessor.

This second source is compared to the primary source, using a weighted average method to determine the variance, with an allowed discrepancy of 20%. Since this is a complicated procedure to explain, a spreadsheet has been developed. It is available on the NABERS Waste Rules page on our website.

The process is:

a) Obtain a comparable second data source for bin counts.

b) Use the NABERS Waste calculation spreadsheet to determine the weighted average of absolute variations for each collection.

c) Compare the weighted average result with the allowed threshold.

d) If the bin service is within the allowed threshold then it passes this test.

6.2.4 GECA Waste Collection Services Standard (additional section)

Where a bin service is covered by a GECA Waste Collection Services Standard, then this bin service will meet the requirements for:

a) Section 6.2.1, Test 3: “Observe weighing procedure;

b) Section 6.2.3 “Testing an independent data source”.

The assessor must note any service that meets this requirement in the provided text boxes on the ratings page for the relevant rating.

This ruling does not exempt an assessor from observing on-site procedures to be confident in the reasonableness of waste data, under section 3.5 “Confirm on-site waste practices”.

6.3 Secondary data sources

The check described in section 6.2.3 requires two sources of data for bin counts. This section sets out the criteria for these second sources of data for various building and equipment operations.

6.3.1 Data from waste or cleaning contractor

In this case the primary data source is bin lifts reported by either the waste contractor or the building’s cleaning contractor.

The following sources are independent of each other:

a) Bin tallies from:

1) Cleaning contractor;

2) Waste contractor;

3) Security contractor;

4) Waste consultant;

5) Building waste manager;

6) Automatic bin weigher;

7) The building owner’s or building manager’s sustainability team or facilities team;

b) CCTV video.

6.3.2 Secondary data source for bins emptied into a compactor or other on-site aggregating equipment

Where a compactor or similar on-site aggregating equipment contains waste from two of more buildings and the an assessor is unable to confirm a secondary source of data for a core waste stream that is placed into a compactor or other aggregating equipment, but can confirm that all other core waste streams from the property have passed section 6.2.3 of these rules, and the data is from the same primary source, then that core waste stream can be deemed to have also passed section 6.2.3 of these rules.

If the waste stream is one of the optional waste types at least 75% of all other waste streams, from the same primary data source, must pass section 6.2.3, for all of them to also pass 6.2.3.

6.3.3 Amending a second source of data

Assessors are allowed to make specific amendments to a second source of data to enable a more accurate comparison with a primary source. Amendments can be made in the following situations:

a) Where bins are tallied before midnight, but collected the following morning before the building opens. In this situation, on-site bin tallies can be shifted forward a day so they match the date of the waste contractor bin counts they relate to.

b) Where bins are taken to the dock regardless of contents, but only presented for collection when full. In this situation, bin tallies for days between collections can be summed to the day they are collected.

If the second source of data is altered then this must be described (how and why) in the comment field of the NABERS Waste calculation spreadsheet.

6.4 Passing the data verification check

If a bin service passes all required checks in section 6.2 then record it as passing the data verification check on the rating page, otherwise record it as not passing.

The exception to this is tests 1 and 2 for testing weight-based data (Section 6.2.1). This check requires weight data to be removed from the platform, so as long as amended data passes the checks in section 6.2.2 and 6.2.3 then it passes the data verification check.

The assessor needs to keep a record of checks and the results.

6.4.1 Assessor discretion

If the assessor has any concerns about the data beyond the tests described in section 6.2, they can choose to not pass that data for the data verification check. The reasons for this decision should be recorded for quality assurance and auditing purposes.

7 Material Recovery Score

The Material Recovery Score (MRS) recognises a building's contribution to better resource recovery and reduced potential pollution, by rewarding the best feasible recovery of materials.

7.1 Purpose and function

The environmental impact of material use relates to:

a) The resource inputs at each stage of the production chain which are then lost if the material is placed into landfill;

b) Pollution arising from disposal methods.

To do address this impact in the Waste Rating a Material Recovery Score is applied to each rating. The score adjusts the rating to reflect the recovery outcomes of materials leaving the building.

The Material Recovery Score is a measure of the quality of the end-of-life outcome of waste leaving a commercial building. It is allocated to bin services that are included in the recycling calculation (refer chapter 4). The value of the score is a number between 0-6, to two decimal places, and is determined by a NABERS Accredited Assessor through the use of the Material Recovery Score tab of the NABERS Waste calculation spreadsheet.

Every waste type has a NABERS standard material recovery score (refer Appendix D: Material Recovery Pathways) which is applied to every rating. However, a building is able to achieve a more accurate Material Recovery Score by investigating its supply chain, documenting the end outcomes of materials leaving the building and applying a site-specific value to each bin service during the rating calculation.

The assessor, working with the building owners and managers can decide if they are going to investigate a value for all bin services, or some of the bin services.

This score is determined by a multi-criteria analysis that assesses each material treatment pathway again criteria for good environmental outcomes.

7.1.1 Operational control of supply chain outcomes

As NABERS measures elements that are within the operational control of the building being rated. In terms of waste management, a commercial building owner has control over whether their contracts and on-site management practices are likely to result in an item going to the best possible re-use.

They do not have control over:

a) The commodities market;

b) Regulation of the waste industry;

c) Where facilities are located;

d) Whether a facility will take their waste on a given day.

Thus, the method does not rate specific facilities, and does not rate on a collection by collection basis.

7.2 Determining building specific MRS values

To determine a building specific MRS value the assessor must verify the most likely outcome of the waste leaving the building (refer section 7.2.2). As a minimum, they must establish the destination of 70% or more of the collections of that bin service. If this is not possible, then a building specific value cannot be allocated to that bin service.

The assessor will require the following information to determine the MRS value for a bin service:

a) Percentage splits of materials from mixed waste bins. This would be determined by a composition audit of the materials in the bin. NABERS standard values can be used where they are provided.

b) Material recovery value determined from NABERS table of values. This requires evidence from a reprocessing facility or waste collector that most of the collections for the year went to a specific recovery outcome.

7.2.1 Collection destination

The minimum requirement for a building specific MRS value is a statement from the waste collection company that 70% or more of the collections of a bin service were received by a specific facility licenced to accept the waste. The name and address of this facility must be provided, as well as its licence number. The following facility types are allowed as a collection destination:

a) A recovery or reprocessing facility;

b) A materials recovery facility;

c) A registered charity;

d) A transfer station.

Where the usual facility is unavailable for a collection, alternate facilities that meet these criteria are allowed to be included in the 70% threshold.

Statement of destination

The statement of destination can be one of the following:

1) The waste contractor has supplied sufficient collection level information via the field *Processing Facility sent to (Optional)* of the NABERS Waste data template (column I).

2) The waste contractor supplies a report with a breakdown of the facilities that received collections from the building, by waste stream. This report must be on company letterhead and executed by an appropriate person from the company.

Verifying the destination

The assessor must view a random sample of primary evidence to verify the statement of destination. The required period is two separate weeks in the rating period, with evidence for every collection recorded in each of those weeks.

Required primary evidence is tipping dockets from the receiving facility.

Where a GECA waste collection services certification is in place for the site, then this meets the verification requirements.

7.2.2 Material Recovery Value - Establishing a recovery pathway

The MRS value is determined by:

a) The nature of the waste stream in which the material is collected from the site. Values are either:

1) Source separated so that no further sorting is required to re-use or re-process the material. An example of this is a bin that only contains cardboard, or only contains organics.

2) A mixed stream where contents of the bin will need to be sorted before they can be re-used or re-processed. An example of this is the mixed recycling or commingled bin that is common across Australia.

b) The material category and type. These two values describe the nature of the material(s) that are recovered ready for re-use or re-processing. Examples include: Food waste – mixed food waste; Glass – containers; e-waste – printer cartridges.

c) The resource recovery outcome for the waste stream. This value describes what happens to the material at the next stage of its lifecycle. Examples include: Re-used/repaired; downcycled; composted; new mixed paper grade product; burnt. Refer to Appendix D: Material Recovery Pathways for a list of identified recovery pathways and definitions.

Plastic			
Bin	**Material type**	**Outcome**	**MRS points**
Mixed Recycling	HDPE - 2	Downcycled	2
Mixed Recycling	PET - 1	New PET product	3
Pre-sorted bin	Soft plastic - mixed	Downcycled	4
			#N/A
			#N/A

Figure 5: MRS data quality schematic

In order to establish the recovery outcome the assessor must establish the most likely outcome for the contents of the bin. This can be established through:

1) Chain of custody level documentation that follows the materials through each stage of the supply chain until they reach the point of re-use or re-processing;

2) A statement from a waste aggregator of most likely end point based on their sales of that material;

3) Research into overall trends in Australian waste management, with justification for the decision to choose a specific value.

Option 3 is not available for all recovery pathways. Refer to Appendix D: Material Recovery Pathways for those pathways this applies to.

The level of evidence will affect the data quality assessment for the MRS value. More reliable evidence will provide a better result. Where a building has a direct relationship with the reprocessing facility this should be straightforward. This will be the case for single material type waste streams where the facility is located in Australia, e.g. paper and cardboard.

Where a stream is a highly traded commodity into an overseas market this will be more difficult, for example plastics sourced from a mixed recycling bin.

Using the MRS tabs in the NABERS Waste calculation spreadsheet, the assessor must select the correct values for each of these elements. The spreadsheet will then provide the MRS for that specific bin service, which is entered onto the ratings page on the platform.

7.2.3 NABERS Standard MRS values

Where it is not feasible for a building to determine a specific MRS for each of their waste streams (for example materials coming from mixed recycling bins) NABERS provides standard values which are automatically applied to all bin services without a building specific value. These values are listed in Appendix F: Waste stream reference tables.

This is in line with the standard values NABERS applies for contamination and density rates.

7.2.4 Mixed bin composition splits

A mixed bin is any bin service where the contents of the bin will need to be sorted before they can be recovered for re-use or recycling. Such waste streams include the mixed recycling waste stream, or any waste stream sent to a material recovery facility or other sorting facility. A combined paper and cardboard bin MAY be considered as a mixed bin if the paper and cardboard are separated for different outcomes, if they are not then this is a single source bin.

The contents of the bin are allocated material recovery values dependent on the outcome of the materials, so in order to determine the appropriate splits the assessor will need to either:

a) Receive information from the MRF or sorting facility as to the materials they sort a bin into; OR

b) Use industry standard categories (refer table 13 below).

Once these categories are known then the percentage to be allocated to each split is determined by a composition audit (see section 5.11). Multiple audits may be completed, at least one of these audits must be performed or supervised by a NABERS accredited assessor in order for the results to be valid.

Where a bin has mixed contents with different MRS values, and the available evidence for these values is of different quality, then overall evidence quality of the bin is determined by establishing which evidence quality applies to the greatest percentage weight of the contents of the bin.

NABERS Standard values for mixed bins

Where a composition audit has not been completed, but the waste stream complies with the requirements for a building specific MRS value, then NABERS Standard bin split values can be used. Allowed values:

Mixed recycling bin

Table 13: NABERS standard composition values for a mixed recycling bin

Material Category	Material Type	Percent split
Plastic	HDPE - rigid	2.8%
Plastic	PET - rigid	12.6%
Plastic	Plastic containers (mixed plastic bales)	12.6%
Metals	Aluminium cans	2.0%
Metals	Tin cans	3.0%
Paper/ cardboard	Mixed paper & cardboard	34.0%
Glass	Glass containers	33.0%

7.3 Data quality

A data quality adjustment is applied to the Material Recovery Score calculation to ensure that a higher rating is achieved where there is more solid evidence for supply chain outcomes.

The data quality score is assessed through considering:

a) How the Material Recovery Value was determined;

b) How any relevant composition values were determined;

c) The quality of evidence available to determine the Material Recovery Value.

The results of this assessment are determined from data input to the Ratings page on the Waste Manager platform, and shown in figure 6.

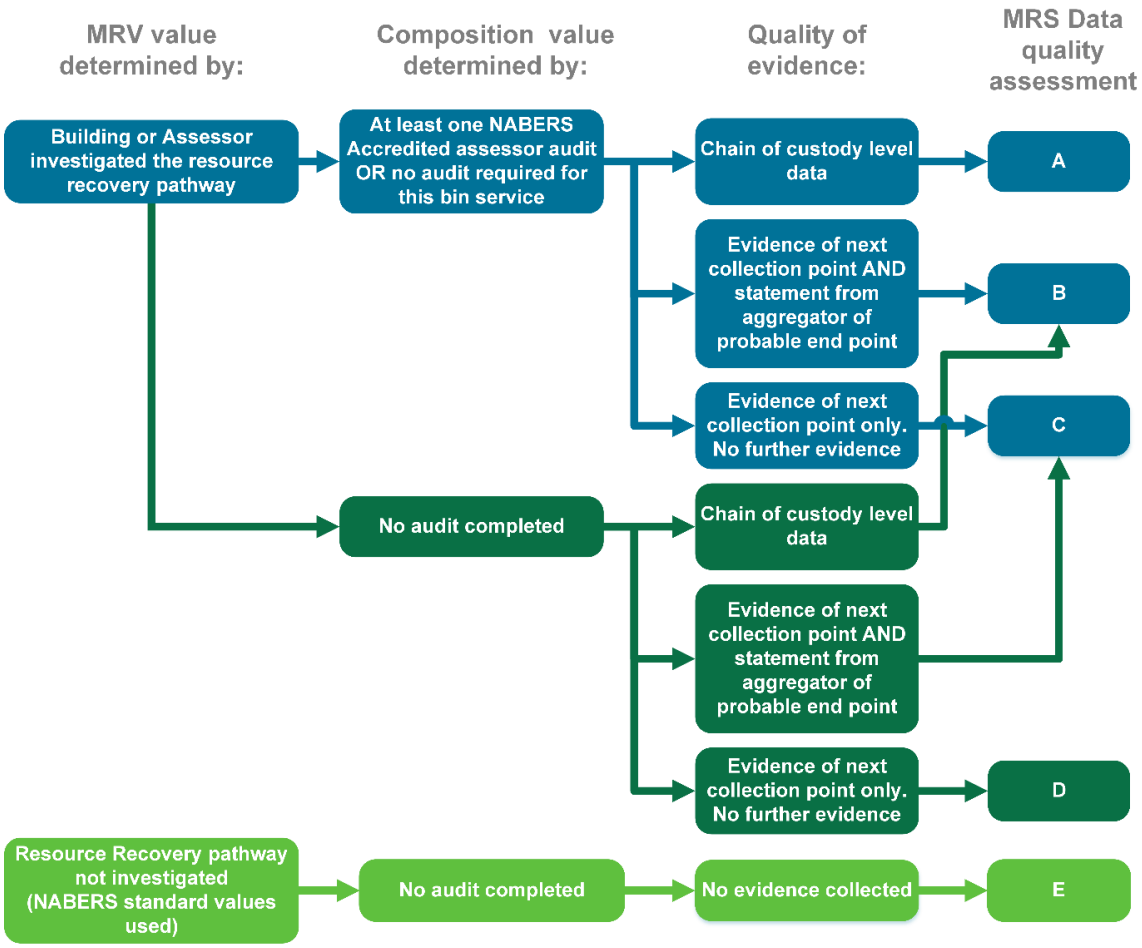

Figure 6: MRS data quality schematic

8 Applying for a rating

A NABERS Waste Rating is a benchmark of the operational waste management performance of a building. This section sets out how to lodge a rating and the rules around rating validity and evidence.

8.1 Lodging a Waste Rating

The process to lodge a rating starts with the platform administrator appointing an accredited assessor to conduct a rating through the rating page on the platform. The rating page on the platform is then unlocked for that specific assessor who can proceed to lodge the rating. See *Appendix E: Process to lodge a Waste Rating* for all tasks required prior to lodging a rating.

Data used for a rating is locked once a rating is submitted to the customer for authorisation. No further changes to the data will be allowed.

A rating is required to comply with the Rules that are current at the time of lodgement. Assessors are advised to seek advice and request a Ruling (if needed) prior to lodging ratings that may require one.

8.2 Rating period

All data used to assess the waste management performance of a building for a rating must come from a continuous 12 month period. This is the “Rating Period” for the building. The waste rating does not allow for estimates of missing data.

8.3 Validity period

Once certified, the rating is valid for 365 days. This is called the “validity period” of the rating.

Assessors have 120 days to lodge the rating after the end of the rating period. Ratings lodged after the 120 days will have a reduced validity period to ensure all ratings are based on current data. Refer to NABERS website for further detail on NABERS ratings validity periods.

8.4 Quality assurance check

All accredited assessments undergo quality assurance checks by the NABERS National Administrator before they are certified. A small percentage also go through an external audit, which is more comprehensive than the quality assurance check.

If the Assessor has not responded properly to the queries and the Waste Rating has not been certified within 130 days, excluding the time taken by the National Administrator, the rating will only be valid from the date of certification until 365 days from the end of the rating period.

8.5 Re-rating a building

A building can have only one Waste Rating for a given period. If an assessor wants to complete a new rating on a building that already has a rating attached to it, two options are available: Replace or Renew.

8.5.1 Renewing a rating

Under the Renew option, the new certified rating will begin its validity period once the existing rating expires. The new rating is valid for a maximum of 365 days from the date of activation.

If the new rating's validity period begins more than 120 days after the end of the rating period the validity will be reduced, as the validity period cannot exceed 485 days from the end of the rating period. This is to ensure current data is used.

Using this option maximises the validity period of the existing rating and eliminates any gap between an expiring rating and a new rating. However, the validity of the new rating can be reduced. This would be the case if the rating uses a rating period that is much earlier than the validity period.

An expired rating can be renewed. The validity period will begin on the date of certification, rather than the date the previous rating expired, and have a validity period as per section 7.3.

8.5.2 Replacing a rating

The Replace option allows the new rating to replace the existing rating immediately upon certification.

This will remove the existing rating's remaining validity period. Building owners might choose to do this if the new rating is better than the existing rating.

8.6 Rating multiple buildings at the same time

A NABERS rating must be completed for individual buildings where practicable. Rating multiple buildings together is not accurate or equitable for the buildings involved; one of the buildings may be high performing and another may be a poor performer. The high performing building will not be recognised, and it will hide the inefficiencies of the poor performing building.

There are situations where several buildings are combined into a single waste rating, such as a precinct sharing a loading dock (see section 2.4).

8.7 Acceptable data and records

An assessment for an accredited NABERS Waste Rating must be based on the data specified in the Rules (including applicable rulings) or as directed by the National Administrator.

8.8 Technical clarifications

Assessors may contact the National Administrator if they want to clarify how to apply the rules to a specific rating. National Administrators may provide interpretation of the Rules, or they may recommend a method to be followed that is not stated in the Rules, but aligns with its intention. This would not require a change to the Rules.

The approved procedure can only be used once for the specific rating. Written correspondence from the National Administrator must be used as proof of approval to amend the procedure.

8.9 Rulings

A ruling is a change to the Rules made by the National Administrator.

An Assessor may propose a ruling by providing:

a) an explanation of the situation. The explanation must include the reason the rules are unsuitable

b) an explanation of the proposed new method and any required calculations or procedures

c) an analysis of the uncertainty or error involved in the method

d) data for the proposed ruling based on measurements or records which have been independently verified.

Proposals will be assessed by the National Administrator by following the Tool Enhancement Assessment. A copy of this framework is available on the NABERS website.

Current Waste Rating technical rulings which amend these rules can be found on the NABERS website.

Once a ruling is published on the NABERS website it is effective from that date and becomes part of these Rules. A ruling always takes priority if there is a conflict with any other section of these Rules. If there is a conflict between rulings the most recent one takes precedence.

These Rules will be updated when appropriate to incorporate any new rulings or major changes to the waste rating scheme.

9 Evidence for a rating

The Assessor should collect the following sets of evidence when completing a rating:

a) Written or digital evidence must be collected for each waste type picked up from the building to confirm that:
   1) All core waste types generated in the building have been included;
   2) All optional waste types included in the rating were generated in the building.
b) Evidence as listed in the Waste measurements section (section 4);
c) Evidence as listed in the Waste audit methods section (section 5);
d) Evidence as listed in the Material recovery score section (section 7).

The rest of this section is provided as a summary of required evidence. It may not be exhaustive. If other sections of the rules require evidence that is not listed here, then that evidence is also needed.

9.1 Summary of evidence for NABERS rating

9.1.1 Building configuration

Data from facilities managers on which waste companies they use for which waste stream, how many bins are covered by the contract and how often they are collected.

a) Photos of bins in situ taken during the site visit;
b) Evidence of contract/service variations for any bin services added or removed during the rating period;
c) Evidence that a single building approach is not possible for multi-building or precincts as per section 2.4;
d) Contracts or other evidence demonstrating that all included waste streams are managed by the building (for a base building rating only).

9.1.2 Weight measurements

Table 14: Required evidence for weight data

Method	Evidence required
Method 1	Evidence to verify weights uploaded to the platform. Any one or more of the following: a) Receipts recording individual bin weights and size;

	b) Waste contractor invoices; c) Cleaner bin tallies; d) Automated bin readers; e) Weighbridge dockets. Evidence of scale calibration to appropriate standards.
Method 2	Evidence to verify data uploaded to the platform. Any one or more of the following: a) Receipts recording bin numbers picked up and size; b) Tally of bin numbers picked up by size. At least one site density audit.
Method 3	Evidence to verify data uploaded to the platform. Any one or more of the following: a) Receipts recording bin numbers picked up and size; b) Tally of bin numbers picked up and size.

9.1.3 Contamination and density audits

a) Completed audit spreadsheet recording:
   1) Weight of an empty bin, or the average weight of a number of empty bins (Tare of one bin);
   2) Sum of the weight of all bins (Gross weight);
   3) Sum of total contamination (Net weight);
   4) Number of empty bins;
   5) Number bins with waste.

b) Photos of each bin and separated contamination.

c) Data from waste companies on allowed contaminants and contamination rates, and Compactor contamination rates.

d) Evidence that bins are only used for a specific building type (in the case of a mixed use building).

9.1.4 Data verification check

a) Evidence of scale calibration

b) If data fails the unreliable data check, but it deemed to be reasonable given the building configuration and practice, then evidence to support this decision

c) Evidence for bin count data comparison, including the spreadsheet used to perform the calculation

9.1.5 Material Recovery Score

a) Evidence to establish that 70% of collections went to an allowed destination

b) Evidence for chosen Material Recovery values

c) Evidence for composition audit results including photos and a completed audit spreadsheet or other data collection method.

9.2 Keeping records

Assessors must keep all records that relate to information used in the rating, in case of future rating audit by the National Administrator. This includes records of assumptions.

All records must be kept for seven years from the date the rating application was lodged.

The records kept for audit purposes must be the actual documents used for the assessment or verified copies. Summaries are not acceptable.

The records kept by Assessors must be to such a standard that it would be possible for another Assessor or an auditor to accurately repeat the rating from only the documents provided.

Appendix A: Definitions

Table 15: Definitions

Term	Definition
Base building	Elements that are within the control of the building owner, for the benefit of all tenants. For the purposes of the Waste Rating the concept of "base building" means only those waste streams that are managed by the building owner or management company and where bins for that waste type are provided to most tenants in the building can be included in the rating.
Bin service	The combination of waste stream, equipment type, equipment size and allocated dock, of any number of bins. E. g. eight 240L [size] general waste [waste stream] bins [equipment type] collected from a site is one bin service, two 660L general waste bins collected from the same site is a different bin service.
Chain of custody	The chronological documentation (or "paper trail") that records the sequence of custody, control, transfer and disposition of materials.
Contamination	Any material found in recycling streams that is not where it should be.
Contamination audit	An audit of one day of materials generated on-site for a bin service that is not going to landfill.
Contamination rate	The ratio of the weight of contaminants in a waste stream to total weight of that waste stream.
Core waste type	A waste type that must be included in the recycling rate calculation if it is collected from the building.
Density audit	An audit of one day of materials generated on-site for a bin service without actual weight data (method 1).
Downcycled	Refers to the process of melting plastics of different resins together so they can no longer be easily recovered with their original chemical composition.
MRF	Material Recovery Facility. A waste processing facility that takes materials from mixed waste bins and sorts them into their component material streams.
Material Recovery Pathway	The recovery outcome for a specific material type. Refers to the combination of material type, sorting needs (bin type) and recovery outcome that provides a specific MRS value.

Material Recovery Score	A measure of the quality of the end-of-life outcome of waste leaving a commercial building. It is allocated to bin services that are included in the recycling calculation (refer chapter 4). The value of the score is a number between 0-6, to two decimal places
NABERS Assessor	An Accredited Assessor of the NABERS scheme, authorised by the National Administrator to conduct assessments for accredited ratings in accordance with these Rules and the NABERS processes and procedures.
NABERS National Administrator	The body responsible for administering the NABERS scheme, in particular for: establishing and maintaining the standards and procedures to be followed in all aspects of the operation of the scheme determining issues that arise during the operation of the scheme and the making of ratings accrediting Assessors and awarding accredited ratings in accordance with NABERS standards and procedures. The functions of the National Administrator are undertaken by the NSW Government through the Department of Planning, Industry and Environment
NABERS standard Contamination rate	The value that NABERS will apply to waste data to determine the estimated contamination rate for a waste stream in the absence of a site-specific rate determined from one or more contamination audits.
NABERS standard Density rate	The value that NABERS will apply to waste data to determine an estimated weight for a bin in the absence of actual weight data, or a site-specific rate determined from one or more density audits.
NABERS Waste Rating	An independent benchmark of a building's recycling rate as determined by the weight of all materials managed by the building owners (or their representatives) that leave the site.
Normal operating conditions	A normal operational day is a day where the occupancy is representative of the average occupancy of the rating period. Confirmation from the operators or managers of the property is required to fulfill this requirement.
On-site assessment	A waste audit. See contamination audit and density audit.
Operational control	
Operational waste	Waste generated on-site during the normal operations of a building
Platform Administrator	The user that has greatest access and control of the Waste Manager platform. The only user type that can start a rating.

Recycling rate	The ratio of Total Recovered Materials to Total Materials Generated expressed as a percentage
Reprocessing facility	An installation or facility where materials are subject to a special process or treatment in preparation for reuse. The facility can receive its sorted wastes from material recovery facilities and transfer stations, or directly from the producer.
Site	The legal boundary of a building that meets the requirements for a specific rating type
Total materials generated	The mass, measured in kilograms, of the contents of every bin, compactor or other waste vessel and leaves the site
Total recovered materials	The mass, measured in kilograms, of the contents of every bin, compactor or other waste vessel and leaves the site EXCEPT any bin, compactor or other waste vessel which contains waste sent directly to landfill
Waste stream	A type of waste
Whole building	A rating that assesses the entire operations and impact of the building, including the impact of tenants. For the purposes of the waste rating the concept of “whole building” means any waste stream in the building can be included in the rating if it meets the measurement criteria.

Appendix B: Secure paper measurement protocols

Secure paper in office buildings is often difficult to reliably measure as it has specific criteria for collection and handling due the sensitive nature of the contents of the bins.

The following situations do not meet the requirements for a reliable measurement of this stream:

a) Invoices that list the number of bins on the floor as the basis of billing

b) Reports that list the number of bins as the only information and then calculates a weight based on this figure

c) Reports that provide a weight per standard period, such as month or week.

The following methods are allowed under the rules to determine a weight for these bins. The data quality rules in section 6 still apply to these methods.

Methods are listed in order of preference, choose the method that is most feasible for the building being rated. NABERS may consider other methods where they are shown to give a reliable weight over a 12 month period. Contact the National Administrator for a determination on alternate measurement methods.

Secure paper Method 1: Bin weights

This method is exactly the same as method 1 in the rules, specifically all bins are weighed on calibrated scales either in the building or on the collection truck. All evidence requirements are the same.

Secure paper Method 2: Bin count with density factor

This method is exactly the same as method 2 in the rules, specifically all bins are counted by a reliable source, with appropriate evidence, and one or more density audits are conducted as per the method set out in section 5.10.

Pay particular attention to the requirement for the audit to be conducted “at point of collection”. In this case this means the bins can be weighed on the floor of the building, just before they are due to be collected by the secure paper contractor.

Appropriate evidence for this method is not an invoice with total bins serviced by the contract, as that does not guarantee those bins were collected.

Reliable sources for this method include:

a) Cleaners that remove the bins from the tenant floors;

b) Security personnel who allow the secure paper contractor into the building and take a tally of collected bins.

Where a density audit cannot be conducted, then the NABERS standard density for secure paper will be used by the platform.

Secure paper Method 3: on-floor bin count with quarterly density audit

Where individual collections cannot be logged, then the following method may be used.

Facilities managers or cleaners perform a regular count of secure paper bins on each floor. Collection frequency can be sourced from an appropriate person in each tenancy. This person should be either an office manager, or the contract manager for the secure paper collection. This statement must be executed by the tenant.

Four density audits must be conducted under this method. If audit data is collected by the tenant, then evidence of training in the method, and a checklist for the procedure should be made available to the assessor.

Any sampling applied to this method under section 5.8.3 are per tenancy, not per building. Only tenancies that comply with these requirements can be counted for this method. No extrapolation of data to tenancies that do not provide data is allowed.

Use of this method must always fail the data quality checks in section 6.2.2 as accurate data is not available.

Secure paper Method 4: Tenant statement with quarterly density audit

Where accurate bin counts cannot be obtained due to access to secure tenant floors, the following method is allowed.

A statement on the total number of bins present throughout the year, and frequency of collection can be sourced from an appropriate person in each tenancy. This person should be either an office manager, or the contract manager for the secure paper collection. This statement must be executed by the tenant.

Four density audits must be conducted under this method. If audit data is collected by the tenant, then evidence of training in the method, and a checklist for the procedure should be made available to the assessor.

Any sampling applied to this method under section 5.8.3 are per tenancy, not per building. Only tenancies that comply with these requirements can be counted for this method. No extrapolation of data to tenancies that do not provide data is allowed.

Use of this method must always fail the data quality checks in section 6.2.2 as accurate data is not available.

Appendix C: Audit process

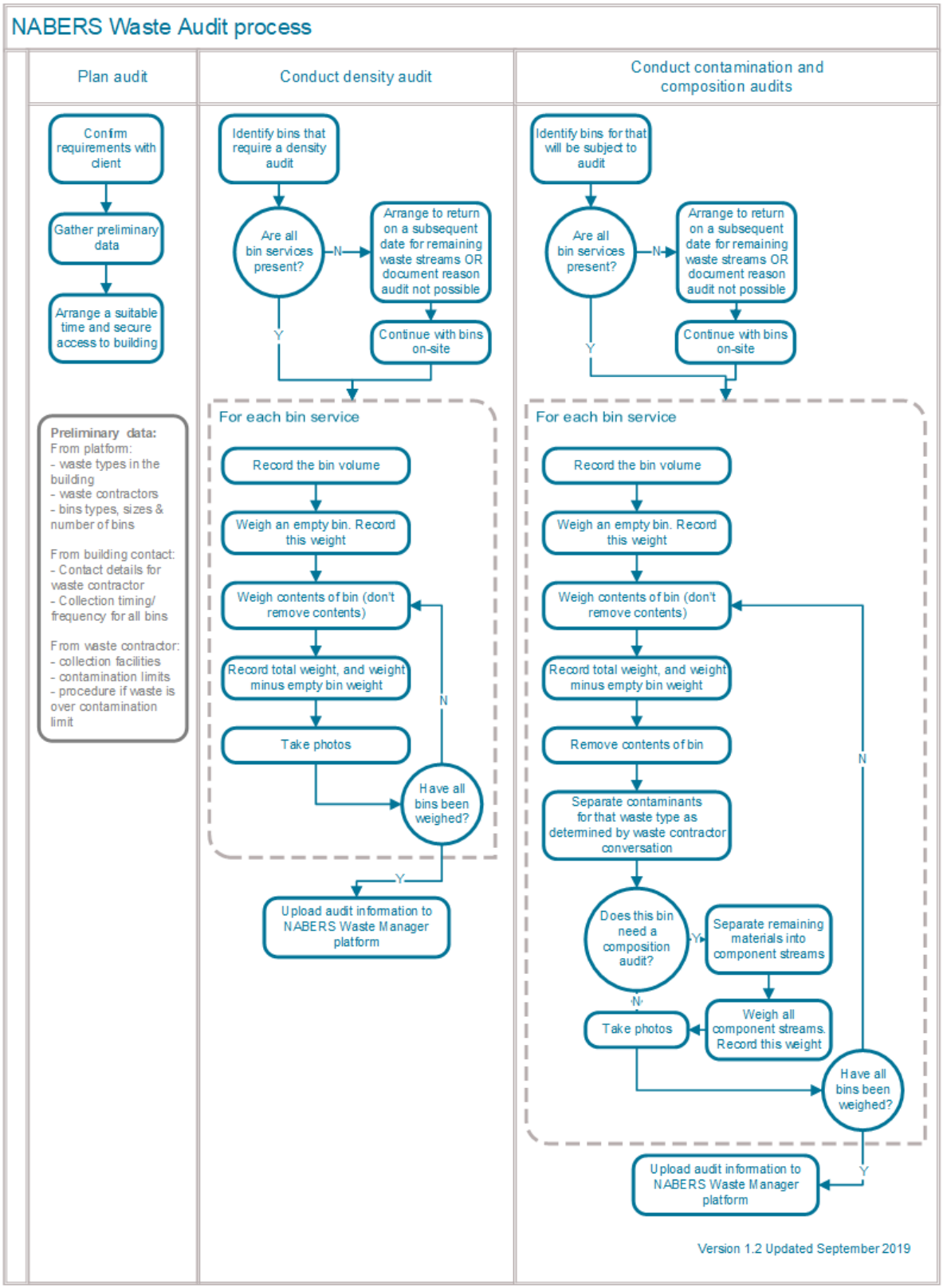

Figure 7: Audit process

Appendix D: Material recovery pathways

Identified pathways by material type

The following tables provide the available material recovery pathways for various material streams, as well as notes on situations in which particular outcomes can be chosen.

Pathways in italics can only be chosen if evidence for that outcome is either:

a) Chain of custody level documentation that follows the materials through each stage of the supply chain until they reach the point of re-use or re-processing

b) A statement from a waste aggregator of most likely end point based on their sales of that material

Burnt can only be chosen as a material pathway if it meets the requirements of section 4.3 on energy from waste.

Downcycled refers to plastics of different resins that have been mixed together so they can no longer be easily recovered with their original chemical composition.

Tables 16-1 to 16-9: Material recovery pathways

Composites

Material type	Possible Outcomes
Liquid paper board	*New mixed paper & cardboard grade product* *Used in compost or other organics process* Converted to composite plastic product Burnt
Coffee cups	*New mixed paper & cardboard grade product* *Used in compost or other organics process*[1] Converted to composite plastic product Burnt

e-waste

Material type	Possible Outcomes
Batteries	*Treated appropriately - licenced facility* Incomplete supply chain information

[1] Only available if the coffee cup is compostable or bio degradable, and has been received by a composting or other organics processing facility.

E-Waste as a bulk item	*Re-used/repaired* *Treated appropriately - licenced facility* Incomplete supply chain information
Printer cartridges	*Re-filled* Downcycled
Light globes	*Treated appropriately - licenced facility*

Glass

Material type	Possible Outcomes
Containers	*Re-used* New glass container product Crushed for sand replacement
Crushed	Crushed for sand replacement

Plastic

Material type	Possible Outcomes
PET - 1	*New PET product* Downcycled Burnt
HDPE - 2	*New HDPE product* Downcycled Burnt
PVC - 3 - Rigid	*New PVC product* Downcycled Burnt
PVC - 3- Flexible	*New PVC product* Downcycled Burnt
LDPE - 4 - Rigid	*New LDPE product* Downcycled Burnt
LDPE - 4 - Flexible	*New LDPE product* *Downcycled* Burnt
Polypropylene - 5 - Rigid	*New polypropylene product* Downcycled Burnt
Polypropylene - 5 - Flexible	*New polypropylene product* Downcycled Burnt
Polystyrene - 6 - Rigid	*New polystyrene product* Downcycled Burnt
Polystyrene - 6 - Expanded	*New polystyrene product* Downcycled Burnt
Other - 7	Downcycled Burnt
Mixed bale	Downcycled Burnt
Soft plastic - colour sorted	*New soft plastic product*

	Downcycled Burnt
Soft plastic - mixed	Downcycled Burnt
Rigid plastic - mixed	Downcycled Burnt

Paper and Cardboard

Material type	Possible Outcomes
Paper sorted by grade	*New paper product (for that grade)* New mixed paper grade product Used in compost or other organics process Burnt
Cardboard sorted by grade	*New cardboard product (for that grade)* New mixed cardboard grade product Used in compost or other organics process Burnt
Mixed paper bale	New mixed paper grade product Used in compost or other organics process Burnt
Mixed cardboard bale	New mixed cardboard grade product Used in compost or other organics process Burnt
Mixed paper and cardboard bale	New mixed paper & cardboard grade product Used in compost or other organics process Burnt

Food waste

Material type	Possible Outcomes
Mixed food waste	*Anaerobic digestion* Composted Pre-treatment to sewer On-site dehydrator then applied to land On-site dehydrator then composted Stockfeed
Food donation service	*Consumed by humans or animals. No industrial processing applied*
Meat and bone	Collected for meat and bone by-products Composted
Fish waste	Collected for fish by-products Composted
Cooking oil	Stockfeed Biofuel – burnt
Compostable packaging	*Anaerobic digestion* Composted Pre-treatment to sewer

Green waste and timber

Material type	Possible Outcomes
Mixed garden and timber waste	Composted Chipped and applied to land

	Chipped for wood by-products Burnt
Timber pallets	*Re-furbished* Chipped and applied to land Chipped for wood by-products Burnt

Metals

Material type	Possible Outcomes
Aluminium	New aluminium product
Ferrous metals	New ferrous metals product
Metals - other	New metals - other product

Textiles

Material type	Possible Outcomes
Whole garment	*Re-sold as whole garment/textile* Used in compost or other organics process Shredded
Off-cuts	Used in compost or other organics process Shredded Burnt

Appendix E: Process to lodge a Waste Rating

This section describes the stages to prepare to lodge a Waste Rating. It provides a step-by-step guide for a typical rating process. Where this section conflicts with text in the main body of this document, the main body takes precedence.

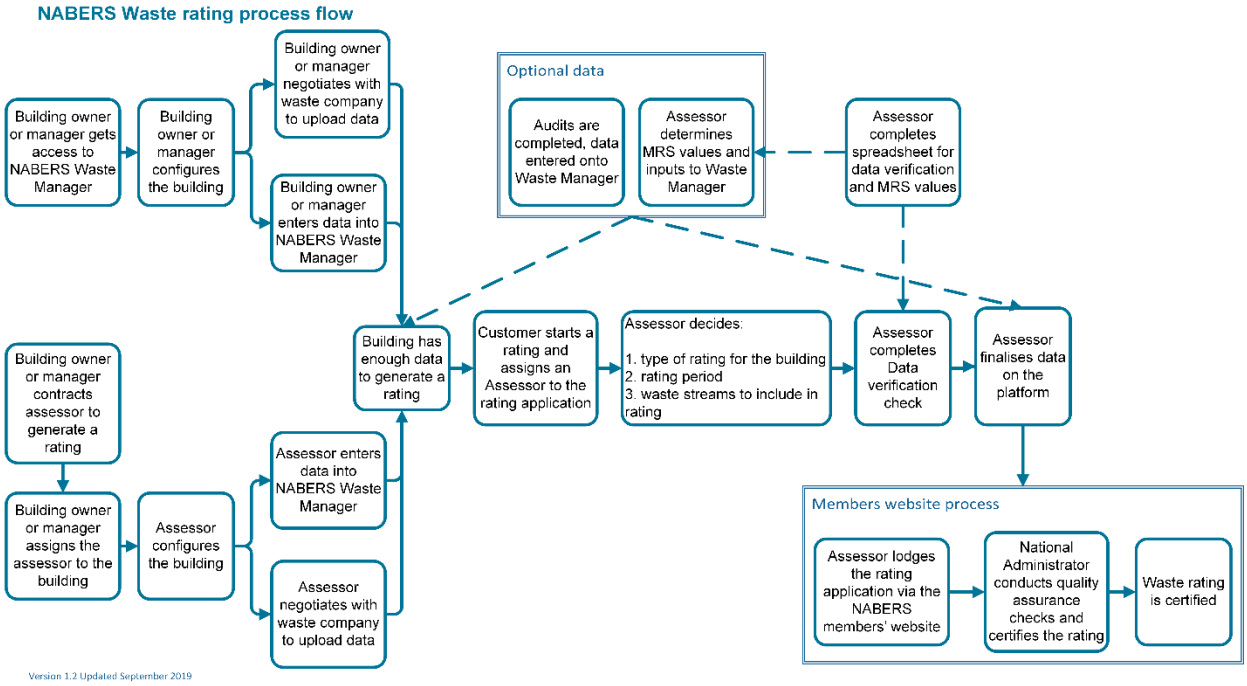

Figure 8: Overall process for a Waste Rating

There are six stages:

1) Platform configuration
2) Preliminary evidence collection
3) Site visit and audits
4) Confirm and verify data
5) Final checks and rating submission
6) Certification

Roles

Assessor – A technical expert accredited by NABERS as able to assess buildings for specific ratings. The only person who can lodge a rating.

Customer – The person who commissions a rating and agrees to certify the final rating. This is usually an employee of the building owner company or building management company.

National Administrator – A member of the team that administers NABERS.

Platform configuration

Purpose: Ensure the platform is correctly setup to reflect the building's waste management configuration.

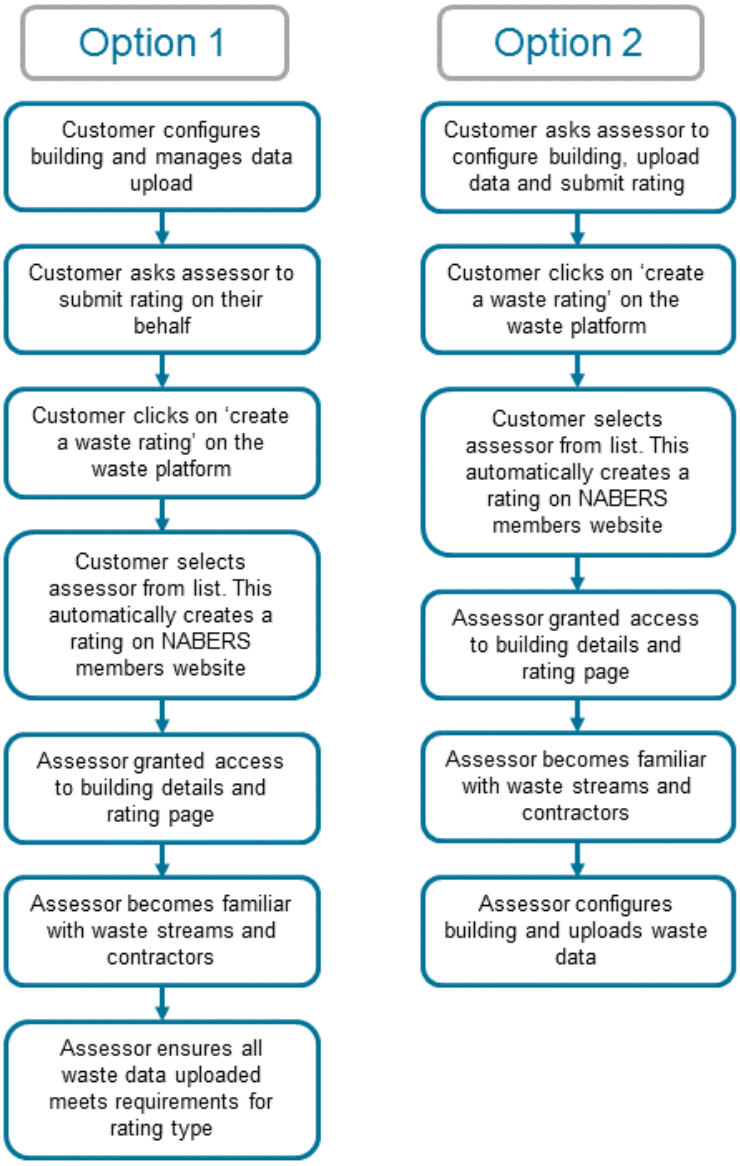

Figure 9: Platform configuration step

An Assessor could also be asked to conduct a rating that is a combination of these two options. For example a building may be configured but has had little or no data uploaded.

For either option data can also be uploaded by a waste company, a cleaning company or a waste data consultant.

Preliminary evidence collection

Purpose: Gather all information needed for the rating prior to the site visit and any waste audits.

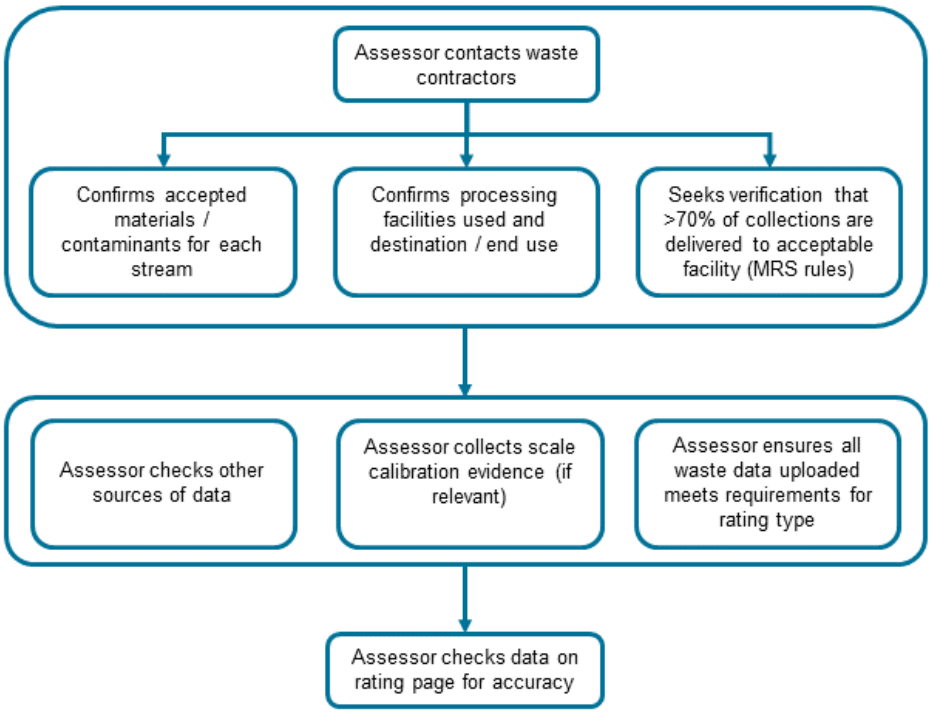

Figure 10: Preliminary evidence collection step

Assessors need to confirm that:

a) Uploaded data looks correct and reasonable at this stage. e.g. if seeking a base building rating there is evidence that uploaded data is for waste managed by the building, not tenants (e.g. invoices);

b) If on-site scales are used, there is evidence they have been appropriately calibrated.

Site visit and audits

Purpose: Ensure the platform reflects on site building conditions, including building specific contamination rates.

A NABERS Accredited Assessor must conduct a site visit to:

a) Confirm platform configuration represents actual operation
b) Confirm all core waste types collected from the premises are set up on the platform
c) Understand on-site waste practices to assess the reasonableness of the waste data
d) Perform or oversee audits (if required)
e) Count bins collected and tally empty bins.

The site visit must establish that the data presented reflects actual practice.

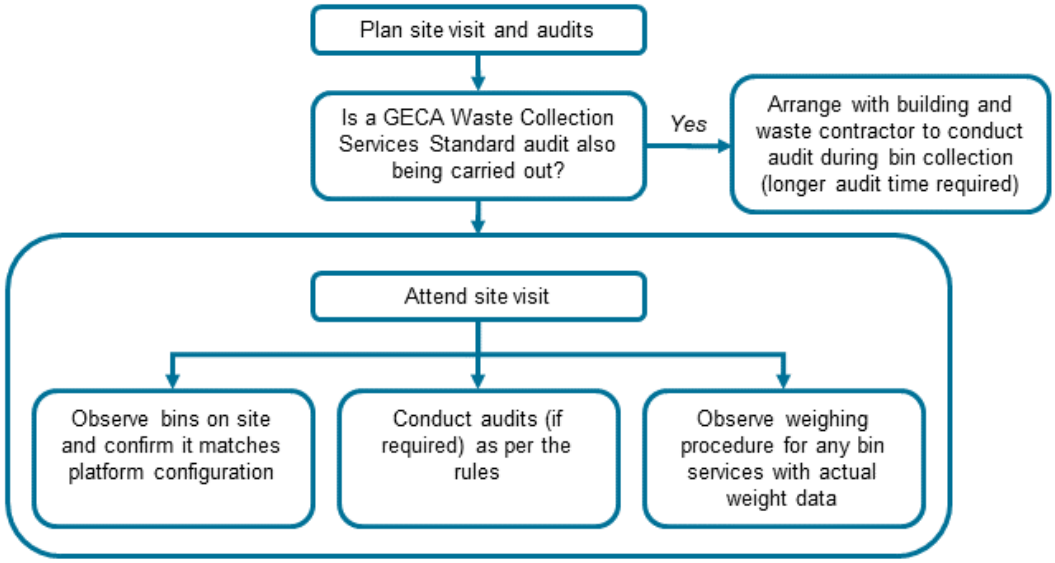

Figure 11: Site visit and audits step

A building can get a rating without completing any waste audits; however this will reduce the data quality factor and affect the rating. An Assessor must still conduct a site visit to confirm that on-site bins match the platform configuration, and to establish any evidence required for data quality checks. Ideally the desktop checks have been completed, so the assessor can verify any discrepancies.

If a GECA audit is being conducted alongside a NABERS Waste Rating, extra time will be required for an audit to allow for an interview with waste contractor staff, regular NABERS audits and observation of contractor processes. Speak to GECA about specific requirements.

Confirm and verify data

Purpose: Check all data is reasonable and correct prior to lodging the rating.

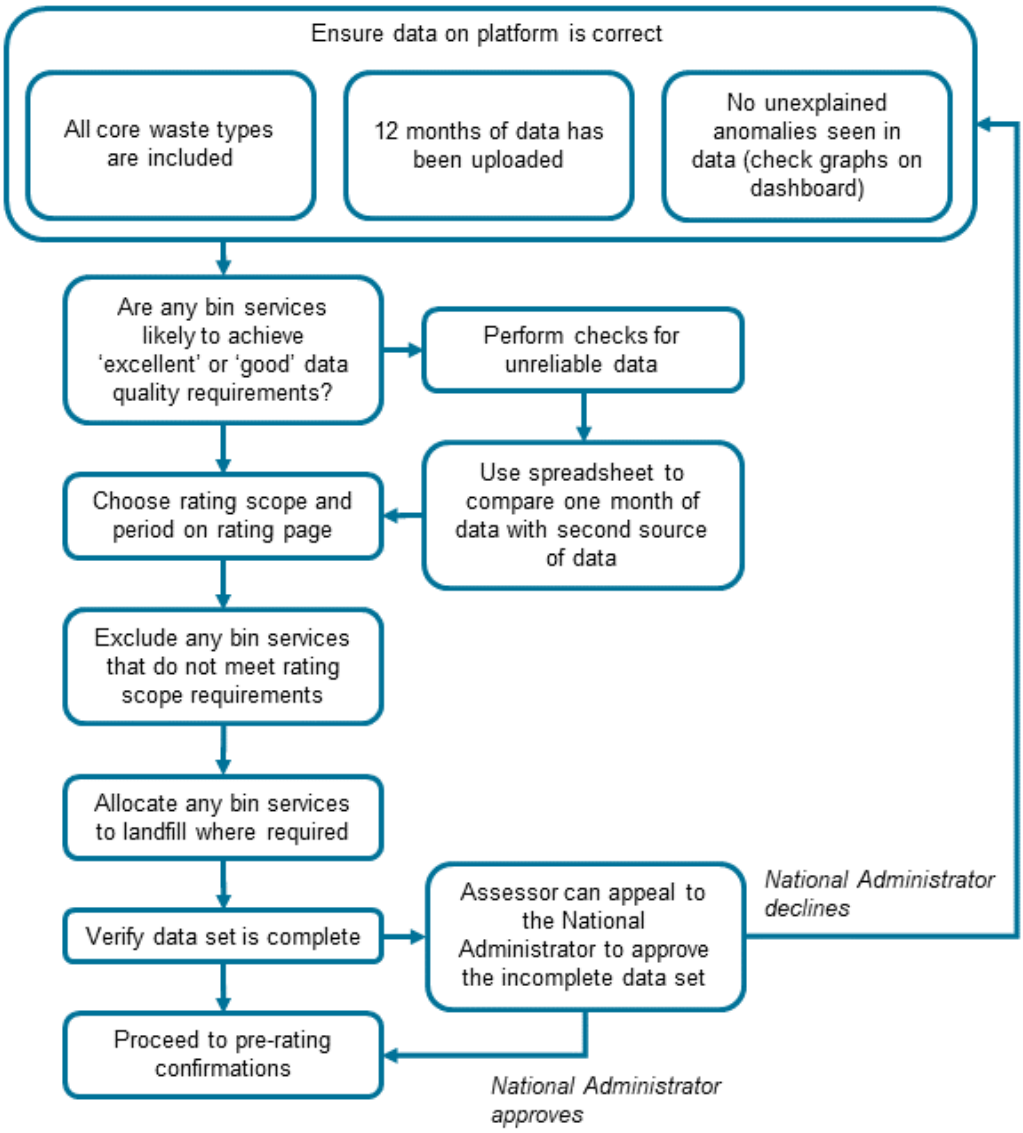

Figure 12: Confirm and verify data step

The second source of data check can be completed at any point in the process. Since it is the more laborious of the three steps in the data verification check, we recommend it is done after the site visit, in case the weighing procedure does not pass the check.

Final checks and rating submission

Purpose: Complete rating process on the Waste Manager platform.

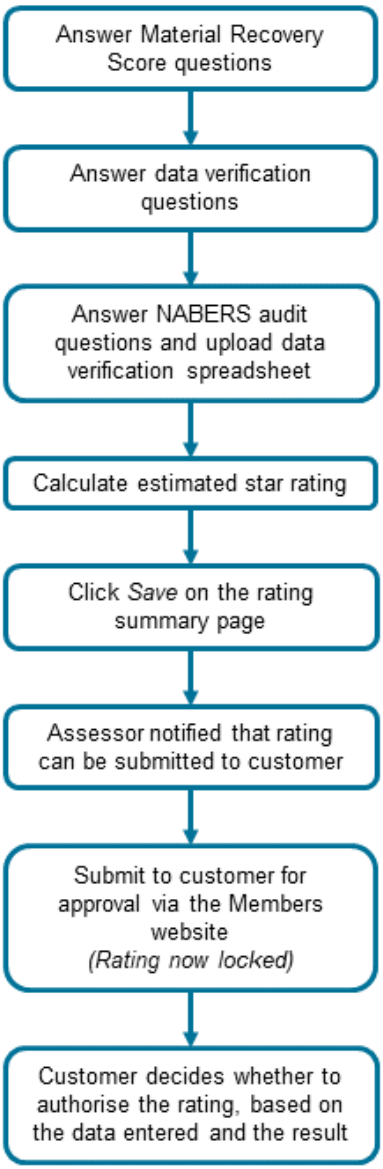

Figure 13: Final checks and rating submission step

If the calculated rating does not appear to accurately reflect the site's recycling rate, check and confirm:

a) Uploaded data is correct

b) All waste types managed by the building are included

c) Data is correct

d) Data verification check has been correctly inputed.

If the above are not correct, Assessors can check the following to try to improve the rating results:

1) Upload data on additional waste types managed by the building.

2) Conduct density or contamination audits on any waste types not previously audited.

3) Amend the data verification check with correct data and/or find an alternate second source of data for comparison.
4) Input values for the Material Recovery Score element of the rating.

Certification

Purpose: Finalise the rating and have it certified by NABERS.

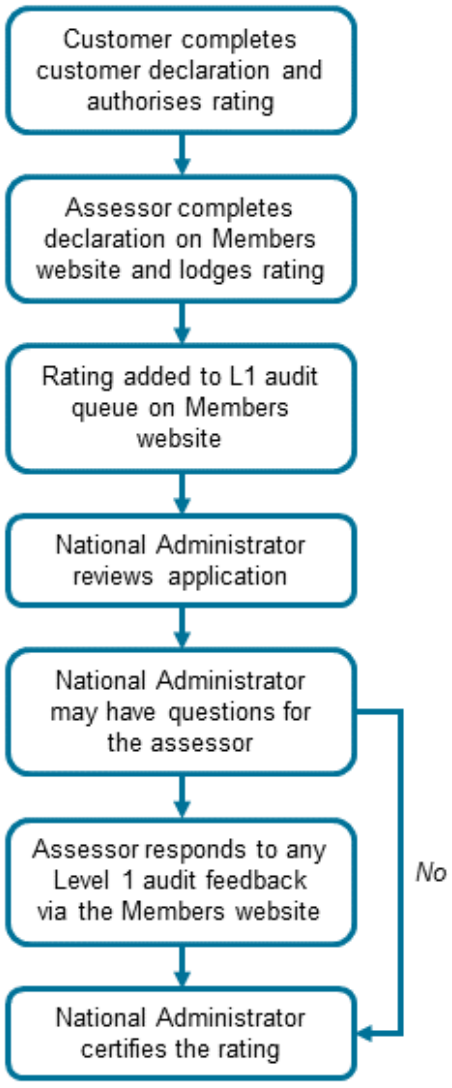

Figure 14: Certification step

The customer of the Waste Rating customer will need to log in to the Member's website to complete the Customer Declaration and approve the rating. They received their password for the site via email when their NABERS customer account was created. If they cannot find the email with these details, customers can reset their passwords on the Member's website or the National Administrator (NA) can have a new password sent to the customer via email.

The full process for a customer to authorise a rating is:

a) Login to NABERS Member's website.

b) Select the Ratings tab.

c) Select Assessments in Progress.

d) Find the relevant rating in the list and select *Open rating* from the right-hand side of the row.

e) Review key points.

f) Complete the customer declaration tick boxes.

g) Select Authorise to complete the authorisation process – this returns the rating to the Assessor to lodge with NABERS.

h) If the rating has errors or omissions, the customer can also click *Decline* to return the rating to draft for editing.

The NA processes 95% of ratings within 10 business days of them being lodged. After a Level 1 audit, the NA often has questions for the Assessor to better understand the building, process and rating results.

Responses to NA questions are submitted via the NABERS Members' website.

Once the rating has been approved, the Assessor can no longer edit anything on the NABERS Waste platform and can only see the rating results page.

The customer can also view the rating results and can continue to edit and upload data that does not affect the rating period.

Appendix F: Waste stream reference table

Table 17: Waste stream reference table

Bin Type	NABERS standard density (kg/m3)	NABERS standard contamination rate (%)	Allowed waste measurement methods	Core waste type for office rating	MRS Standard Value
General waste	105	N/A	Any	Y	N/A
Mixed recycling	60	30	Any	Y	2.88
Paper & cardboard (mixed stream)	50	5	Any	Y	5
Paper	90	5	Any	Y	5
Cardboard	35	2	Any	Y	5
Cardboard (compacted)	90	2	Any	Y	5
Secure paper	80	N/A	Any	N	5
Paper towel	N/A	15	Weight only	N	0
Organics	280	2	Any	Y	5
Green/garden waste	N/A	N/A	Weight only	N	4
Food donation	N/A	N/A	Weight only	N	6
Soft plastics	25	2	Any	N	4
Dry waste	70	2	Any	Y	0
e-waste	N/A	N/A	Weight only	N	5

Bin Type	NABERS standard density (kg/m3)	NABERS standard contamination rate (%)	Allowed waste measurement methods	Core waste type for office rating	MRS Standard Value
Batteries	N/A	N/A	Weight only	N	5
Mobile phones	N/A	N/A	Weight only	N	5
Light globes and tubes (lamps)	N/A	N/A	Weight only	N	5
Coffee cups	N/A	5	Weight only	N	3
Coffee pods	N/A	N/A	Weight only	N	5
Printer cartridges	N/A	N/A	Weight only	N	4
CDS mixed recycling	53	2	Any	Y	2.69
CDS plastic containers	25	2	Any	Y	3
CDS aluminium cans	27	2	Any	Y	4
CDS glass bottles	200	2	Any	Y	3
CDS cartons	30	2	Any	Y	0
Glass	200	2	Any	Y	3
Crushed glass	N/A	N/A	Weight only	Y	3
Cooking oil	910	N/A	Any	N	0
Polystyrene	15	2	Any	N	4
Scrap metal	N/A	N/A	Weight only	N	4
Hard waste	N/A	N/A	Weight only	N	N/A
Pallets	N/A	N/A	Weight only	N	4

Contact us

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