



# Incinerator Bottom Ash Processed

by Skips R Us



RECYCLED AGGREGATES IRELAND

 [www.skipsrus.com](http://www.skipsrus.com)



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## Company Background

Skips R Us Limited (SRU) was established in 2008 with the vision of providing an expansive, cost-effective waste management service to public bodies, commercial and private users alike. Initially specialising in skip hire, the business and its Facilities have evolved with a significant part of the business providing waste management services to external waste contractors and local councils. A key to its success since its foundation is the business’ strategic location in Co. Armagh that is only c.10minutes drive from the strategic M1 motorway linking NI and the ROI. This prime location gives SRU a unique trading and geographical advantage in its ability to readily access and serve its Customers within the N. Ireland (NI) and the Republic of Ireland (ROI) marketplaces.

## Regulatory Consents

Uniquely located, SRU has obtained all necessary regulatory consents and permissions (listed below) from NI and ROI Waste Regulators required to deliver a high-quality waste management service to the private and public sectors in each jurisdiction.

- Waste Management Licence issued by the NIEA No: LN/18/21(perpetual).
- Waste Carrier Licence issued by the NIEA. Ref. ROC UT 7536 (expires 01-08-2024).
- Waste Collection Permit issued by the National Waste Collection Permit Office – ref. NWCPO-1 3-11 171 \_04 (expires March 2027).
- Broker Dealer Registration issued by the National TransFrontier Shipment Office ref. – IRE/ AG337 /23 (expires February 2023).
- Road Transport Operators Licence issued by the Department for Infrastructure (NI) : ON2006898 (perpetual).

SRU is also fully accredited to the following International Organisation for Standardisation (‘ISO’) standards: Quality ISO9001, Environmental ISO14001 & Occupational Health & Safety ISO45001.

# Recycled Aggregates Ireland, IBA Processing, & The All Island Approach

Recycled Aggregates Ireland is a subdivision of Skips R Us Ltd and unlike the skips division, specialises in the recovery of various types of single and/ or mixed streams construction and demolition (C&D) wastes by processing at the Facility to produce recycled (granular) aggregate products as an alternative to virgin materials.

The waste recovery and aggregate production process involves manual picking (e.g. to remove oversize fractions, contaminants), removal of ferrous and non-ferrous metals followed by mechanical treatment involving particle size reduction through an impact crusher, light-fractions contaminant removal using a ‘wind shifter’ and particle size grading via a screener. The principal waste input materials are inert, mineral based from the C&D sector and to a lesser extent from commercial and industrial and municipal sectors.

The Facility is also licensed to accept Incineration Bottom Ash (IBA) under EWC Code 19 01 12.

At SRU, we believe in the proximity principal and that all wastes should be recycled and recovered as close to the source as possible. With the location of the facility only one hour from Dublin and Belfast capital cities, we are ideally located to provide an all-Island solution for the recovery of IBA & other wastes to produce reusable waste and non-waste products.

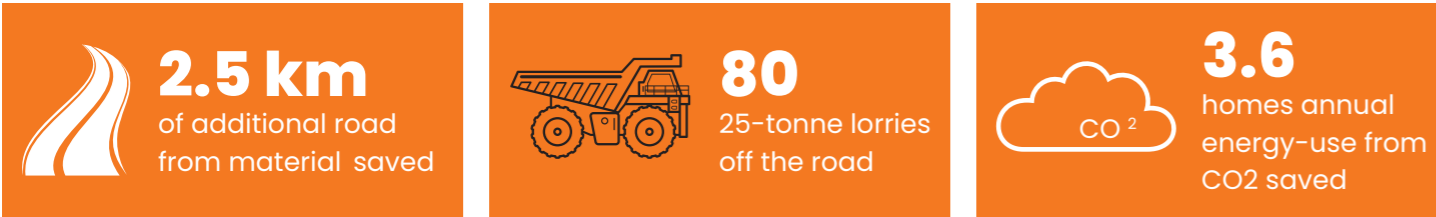


# The Benefits of Recycling IBA & The Circular Economy

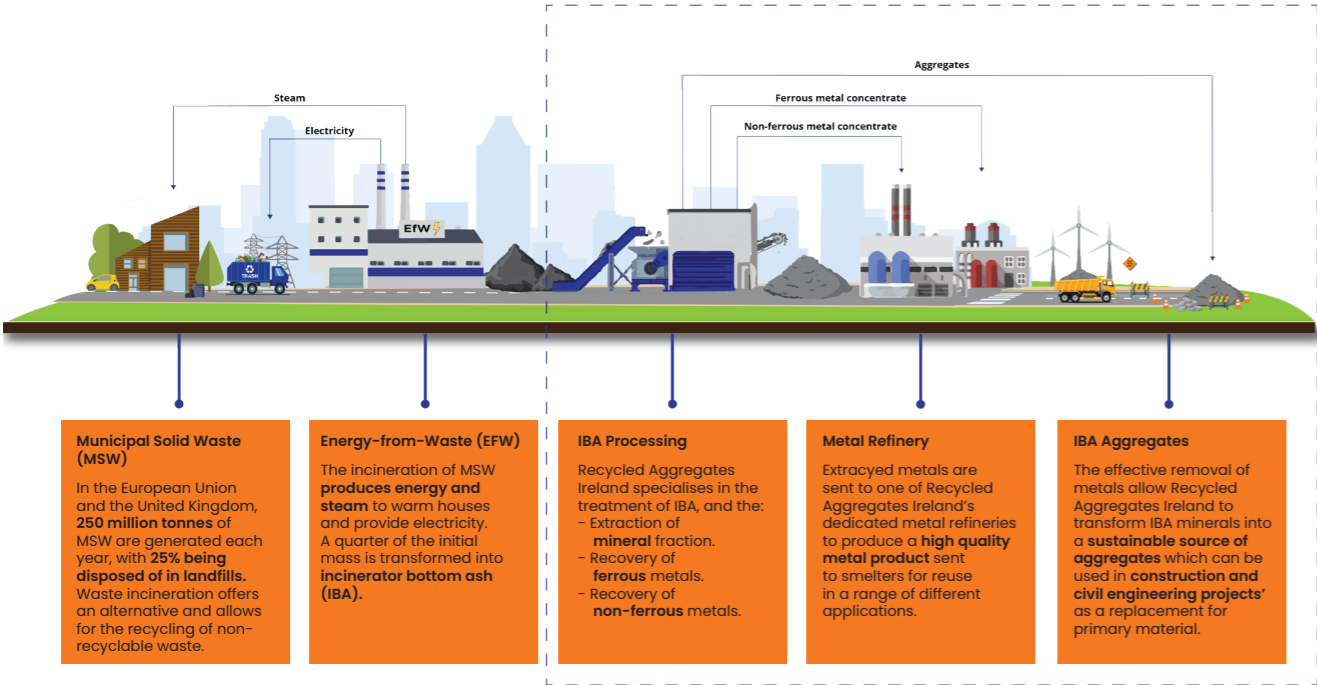
Improving the circularity of resources is at the core of Skips R Us' operating philosophy and business strategy as we believe it is necessary for society to transition to a low-carbon, sustainable future. It is our aim to process IBA wastes generated at Energy from Waste facilities to produce aggregates for reuse locally, whether within N. I or the RoI. In doing so, we will help reduce GHGs emitted from virgin resource extraction, production and transport.

IBA Aggregate ('IBAA') is a sustainable and accepted alternative to Type 1, 6F4 and 6F5 capping and consists of fused clinker, ceramics, glass, stone and concrete. It has widely been used in construction for over 20 years and has been approved by the Environment Agency (England-via its Regulatory Position Statement RPS 247), in Scotland by SEPA (via its Position Statement WST-PS-045) and Highways England (via SHW Series 600) with great success.

IBA aggregate can be used in a variety of applications (see image below), for example as unbound for example, in bulk fill and sub-base applications and hydraulically bound in road paving and low-strength construction products applications.



Compared to 10,000 tonnes of primary aggregates



# The Process and Breakdown of Recovered Materials

Once a waste load containing IBA is accepted onto SRU's Facility, it is temporarily stored within a designated covered bay prior to treatment, which is summarised below and depicted in the preceding process:

- IBA collections are pre-notified to the competent authorities and are accepted at SRU's facility via TFS agreements.
- IBA is stored within a covered, designated reception bay to control moisture levels.
- Using a wheeled shovel loader, IBA material is fed into the Cobra 290 Impact Crusher to liberate metal particles bound to e.g., cement.
- Magnetic separation is performed using an overband magnet to remove larger ferrous fractions (>40mm) which are fed into a segregated skip by a side feed belt conveyor.
- A wind shifter is then used to remove fine fractions, typically sub-2mm particles. These materials are

tested to confirm their suitability for further, offsite recovery/ reuse and / or disposal.

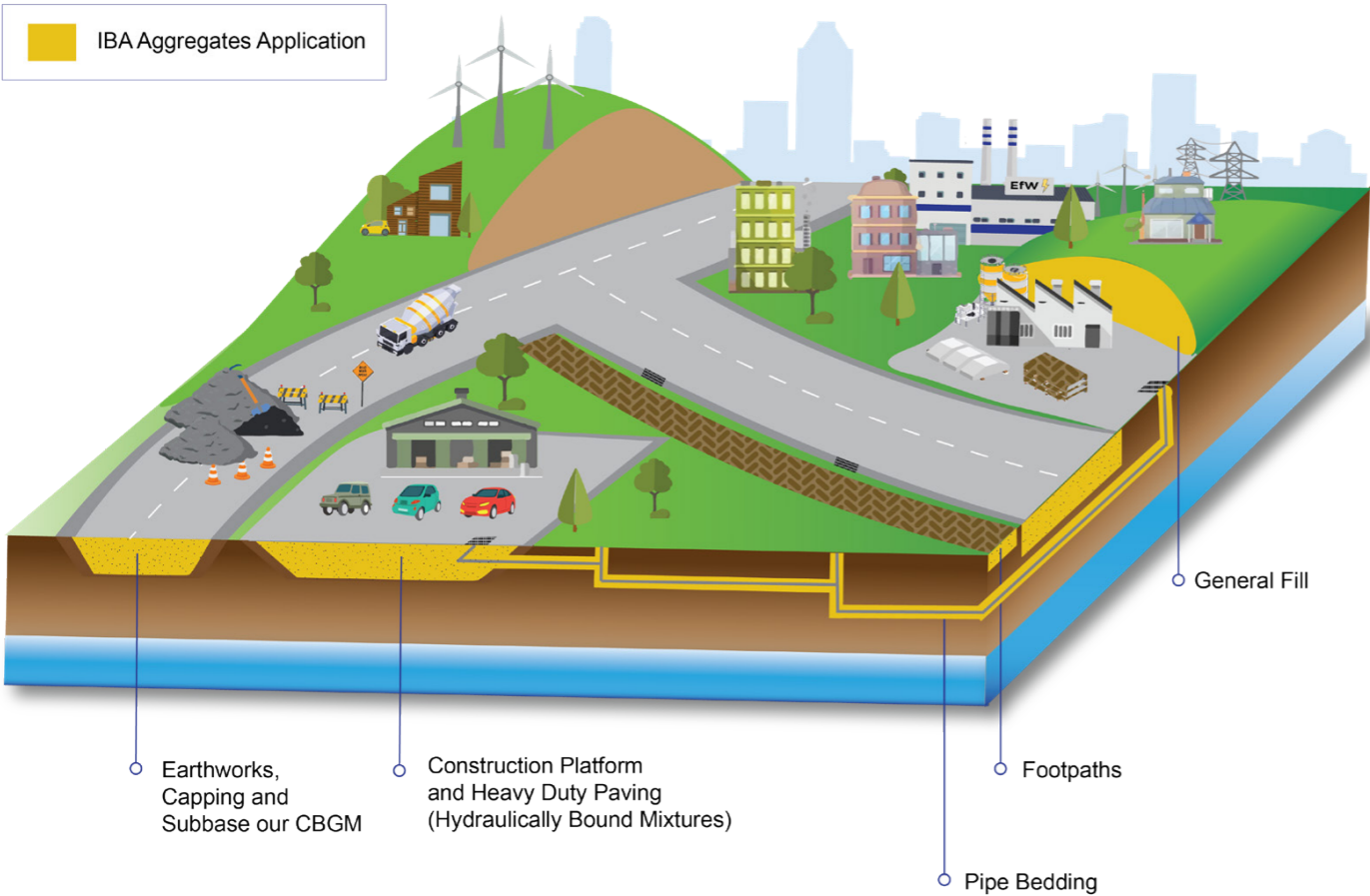
- A 3D Screen is used to separate out larger aggregate particle sizes for further screening.
- Material is then screened using a Powerscreen Warrior 1400x Screener fitted with a 25mm breaker deck and a 10mm self-cleaning bottom deck to produce 2 separate fractions.
- Both fractions then flow over the Steelweld Strobe ECS 1500 where the magnetic drum removes the remaining ferrous fraction 40mm down.
- All material is then processed via an eddy current separator for the removal of non-ferrous metals.
- The remaining mineral fractions are further screened to removed residual amounts of fines. Recycled aggregates are then tested in accordance with the WRAP Quality Protocol for reuse off-site.



**Breakdown of composition:** The following percentages for recovered fractions and treatment residues are approximate as SRU is aware that compositions can vary depending on the IBA source (types of wastes thermally treated), the thermal treatment process itself:

**Expected Percentage Range**

Material	Percentage Range	End Use
Ferrous Metal >40mm	5-15%	Metal recycler/ to smelter
Non-Ferrous Metal < 40mm	1-5%	Metal recycler/ Broker to smelter.
Fine Fraction Ash/Organics	5-15%	Various e.g., land improvement works, relevant (construction) works
Aggregate 1B & 6F5 (>40mm (mineral based) and >2mm (fines- e.g., minerals, glass, ceramics)).	50-90%	Construction/ Engineering.



# The WRAP Quality Protocol & Grading Specification for IBA

The Waste Protocols Project was a joint Environment Agency and WRAP initiative in collaboration with industry, funded by the Department for the Environment, Food and Rural Affairs (Defra), the Welsh Assembly Government (WAG) and the NIEA as a business resource efficiency activity.

The project developed quality protocols which clearly set out the steps that must be taken for the waste to become a non-waste product or material that can be either reused by business or industry, or supplied into other markets, enabling recovered products to be used without the need for waste regulation controls.

All the grades produced by SRU are tested against the relevant Specification for Highway Works (Series 600 Earthworks) in accordance with the WRAP Quality Protocol, by a UKAS Accredited material testing service provider.

Due to the standardisation of equipment and processing, where 3 sets of test results for any property demonstrate compliance with a single grade, this testing frequency can be reduced to a quarterly basis. All test results are stored on file and electronically for a minimum off 3 years.

Non-conformity can arise at the following stages: constituent in delivery, constituent in storage, during handling and during onsite storage of the waste material. If a non-conforming constituent, process,

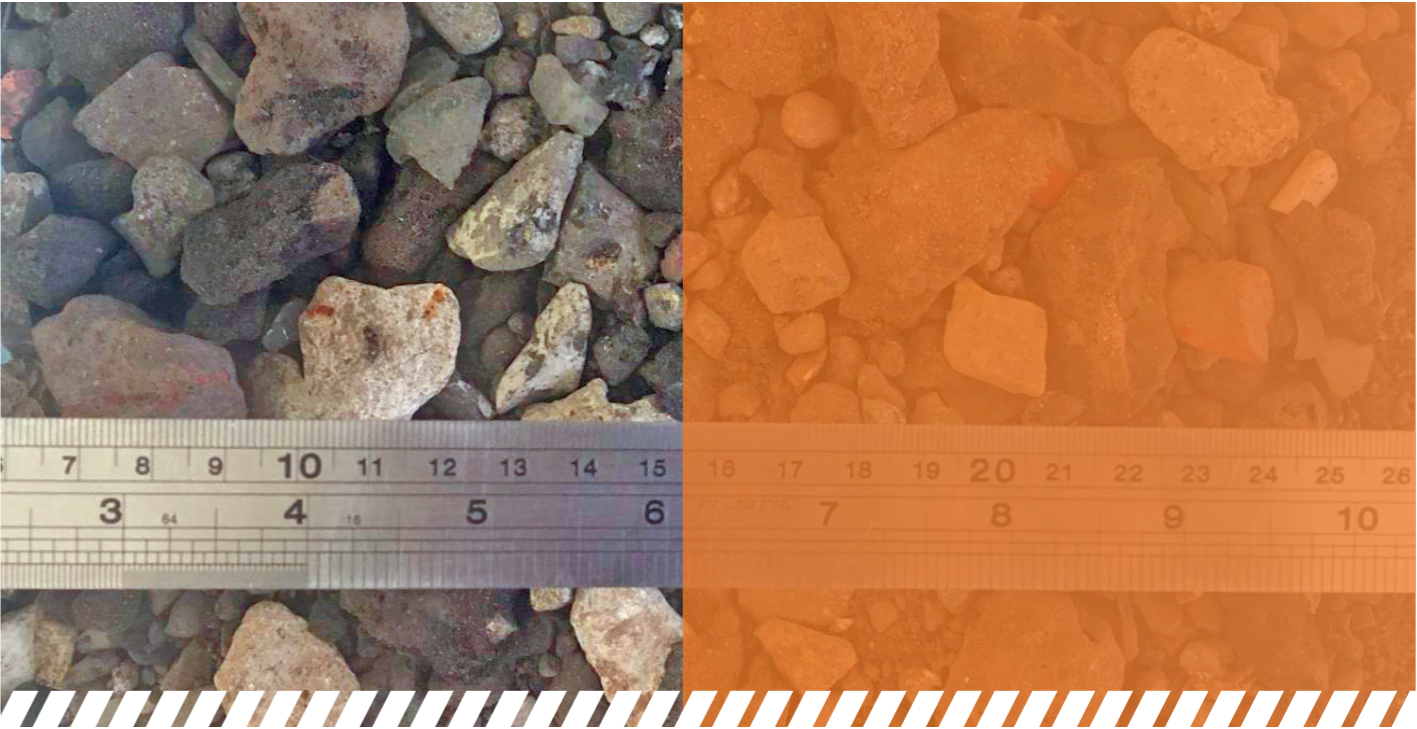
or mixture is identified, investigations are initiated to determine the reasons for non-conformity and effective corrective action shall be implemented to prevent recurrence.

A WARP product Quality Control Form will be issued for every collection or delivery of recovered aggregate product that leaves SRU's Facility. This will state that the product was produced under a quality management scheme, conforming to the WRAP Quality Protocol and will also provide sufficient detail regarding the aggregate's physical characteristics and its designated use(s). SRU estimates that 50-90% of the IBA it accepts and processes will conform to the WRAP Quality Protocol.

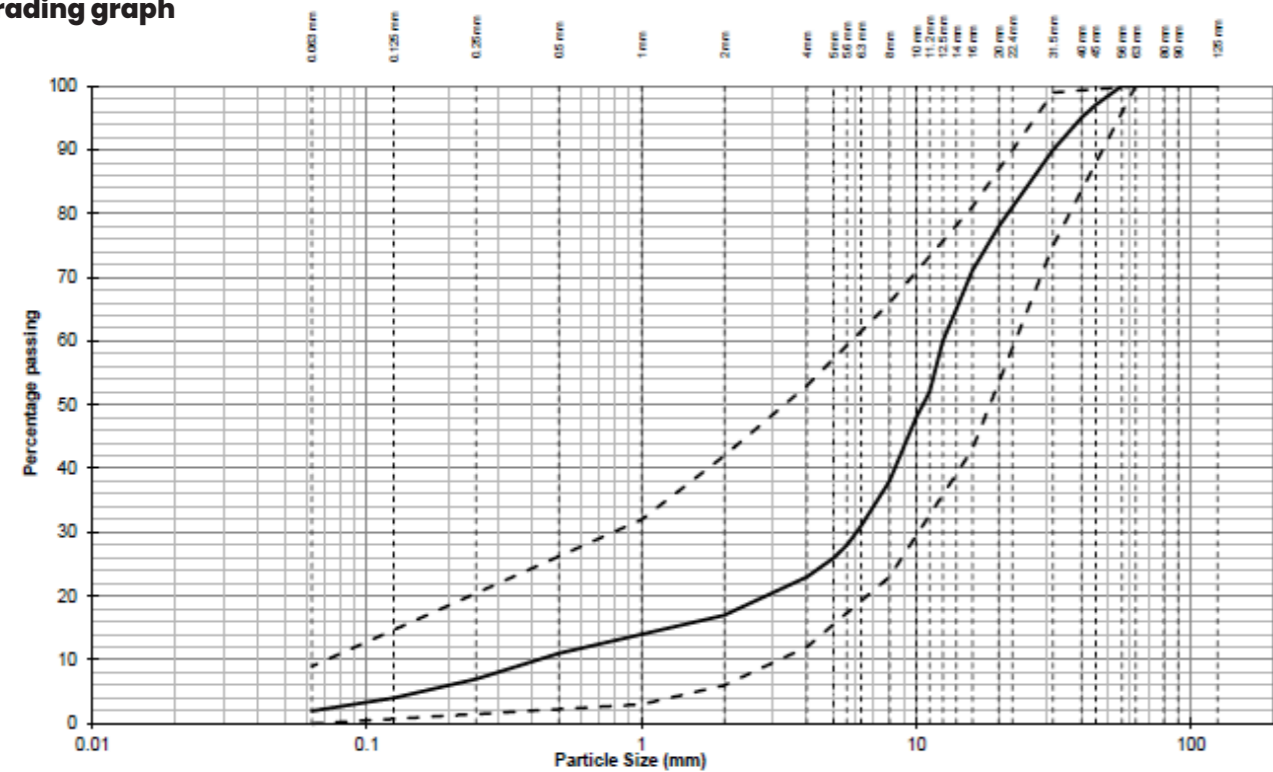
**Gradings/specifications available for Type 1 IBAA (0/40mm)**

The following tests are applicable to the testing of Type 1 IBAA

- Grading
- Los Angeles ('LA') test
- Frost Heave
- Asbestos Screening
- Chemical analysis.



Grading graph



Typical Type 1 IBAA Grading chart

Sieve size mm	% Passing	Type 1 limits
125	100	
90	100	
80	100	
63	100	100
56	100	
45	99	
40	99	
31.5	97	74-99
22.4	88	
20	86	
16	80	43-81
14	77	
12.5	74	
11.2	71	
10	69	
8	61	23-66
6.3	54	
5.6	52	
5	48	
4	43	12-53
2	22	6-42
1	15	3-32
0.5	10	
0.25	6	
0.125	3	
0.063	2	0-9

# IBA Processing Technology

Phase 1 – Cobra 290 Impact Crusher



Phase 2 – Powerscreen Warrior 1400x Screener



Phase 3 – Steelweld Strobe ECS 1500



# Reporting & Recovered Products

## CUSTOMER WASTE REPORTING

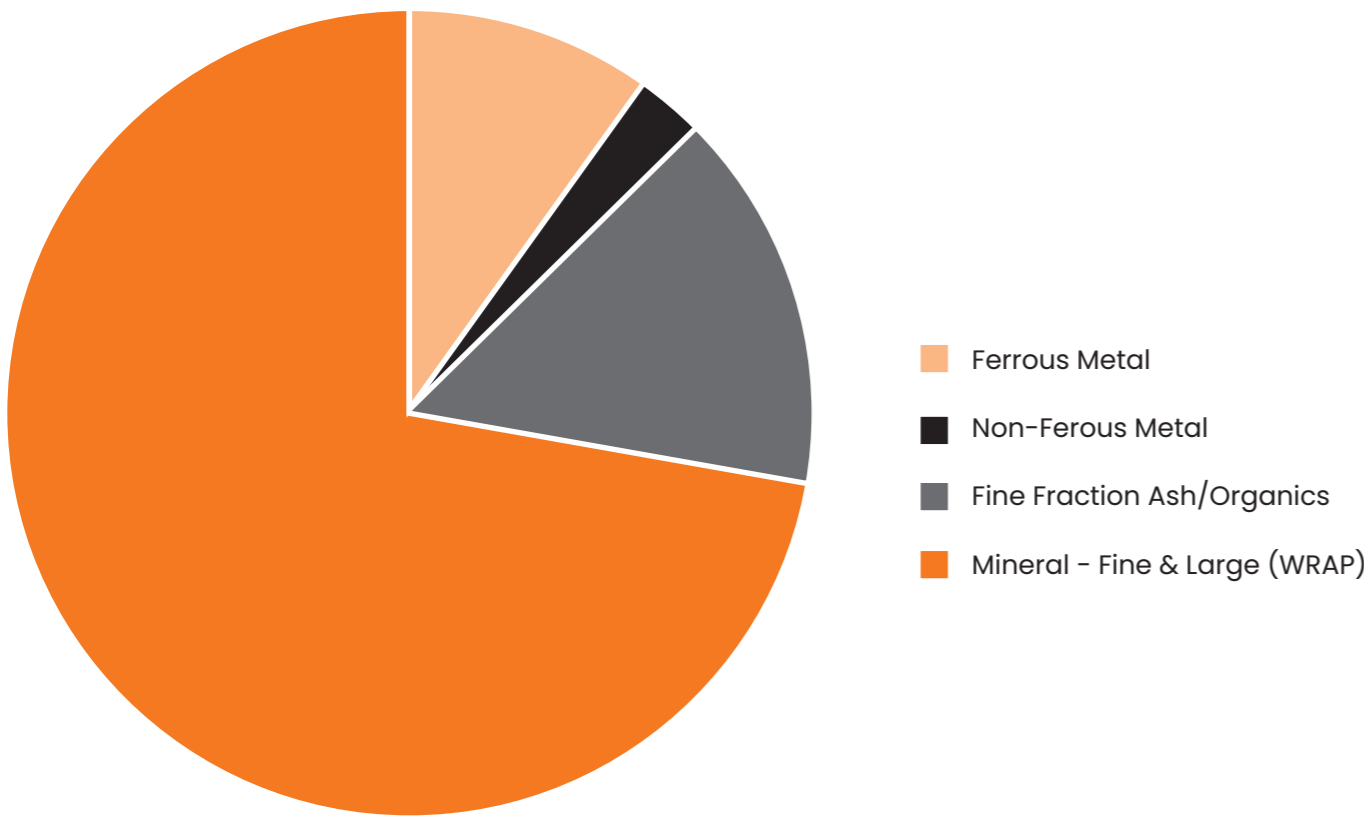
SRU has customised the Waste(Logics) end-to-end waste management software system for optimal performance against its business is utilised across all elements of the business from customer orders, logistics, transport, weighing, invoicing and a wide range of business and client-centric reporting . It boasts several useful, interactive features such as:

- **Go paperless with mobile devices and electronic signing** – for drivers, compliance and weighbridges
- **Experience real-time order processing** – includes onsite issue management and focused order update notifications
- **High-performance route planning and optimisation** – benefit from maps, trails and easy-to-use drag and drop functionality

- **Self-service utility** – SRU customers have instant access to electronic invoices and recycling reports
- **Service hub made simple** – track conversations, tasks and follow ups with customers and suppliers.

Reporting using pie chart analysis (the example below is for IBA accepted at our Facility) along with recycling rate histories, allows SRU and its customers to quickly see how much of each type of their waste received is removed from site for recovery or disposal. Reports can also be prepared for each load accepted over our Facility's weighbridge such as date, gross and nett weights etc.

Incinerator Bottom Ash EWC 19 01 12



SRU can provide its customers with accurate and tailored Reports at specified internals, including annualised and can be as detailed or as simple as required.

# Process Flow Stages

## Steps 1-2



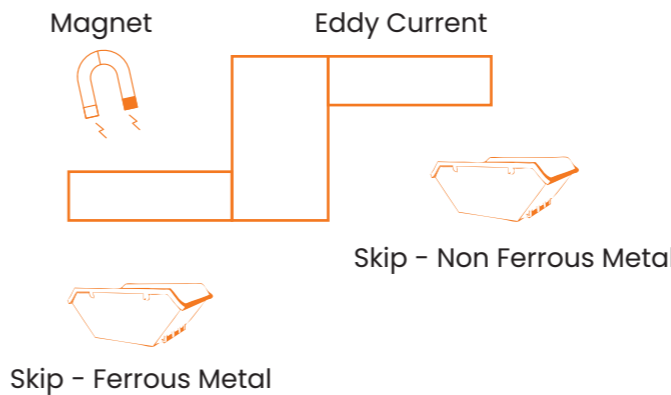
1. IBA Accepted at SRU -TFS
2. IBA stored within covered bay

## Steps 4-6



4. Magnetic Separation
5. Wind shifter Air Separation
6. 3D Screen to separate larger minerals

## Steps 8-9



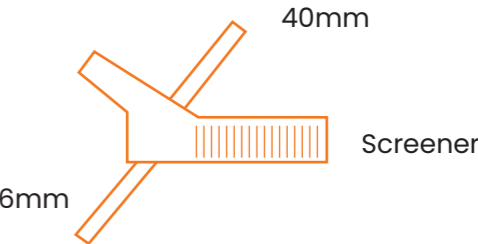
1. IBA Accepted at SRU -TFS.
2. IBA stored within covered designated reception bay to keep moisture levels low.
3. IBA Loaded into Cobra Impact Crusher to liberate metal particles from other fractions.
4. Magnetic Separation – Overband Magnet Removes Larger Ferrous Items >40mm.
5. A wind shifter is used to remove fine fraction ash and fine organics, typically sub 2mm particles. Materials tested to confirm inert classification for offsite recovery.
6. A 3D Screen is used to separate out larger minerals for further aggregates screening.

## Step 3



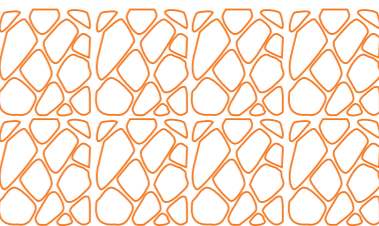
3. IBA Loaded into Cobra Impact Crusher

## Step 7



7. Material is then screened

## Steps 10



10. Stockpile of Aggregate
7. Material is then screened using a Powerscreen Warrior 1400x Screener fitted with 40mm breaker deck and 6mm self-cleaning bottom deck to produce 2 separate fractions.
8. Both fractions then flow over the Steelweld Strobe ECS 1500 where the magnetic drum removes the remaining ferrous fraction – 40mm down.
9. All material is then processed via an eddy current separator for the removal of mixed non-ferrous metals.
10. Remaining mineral fractions are further screened for the removal of residual dust. Recycled aggregates are produced under the WRAP Protocol for reuse with full laboratory testing.

# Recovered Products

## FERROUS AND NON-FERROUS METALS



## MOT TYPE 1 RECYCLED SUB



## TYPE 6F5





For further information on the contents of this brochure the contact personnel listed below are available for responses, discussion on matters relating to this proposal:

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