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EMR Limited

Site Capacity Assessment



Report produced for Cupral Group Limited

Provided by Walker Resource Management Ltd (WRM)

Document Title	Site Capacity Assessment	
Revision	v1.2	
Date	09/05/2024	
Document Reference	CUP-A03-Site Capacity Assessment	
Project Reference	1029/W04	
Author	Martin Ropka	
Reviewer	James Hay	

Version No.	Date	Description of change
0.1	28/05/2021	First Draft
0.2	10/06/2021	Cupral Review
0.3	02/07/2021	WRM Review
0.4	02/07/2021	Cupral Review
1.0	05/07/2021	First Issue
1.1	10/06/2022	Minor update to waste references
1.2	09/05/2024	Update with EMR business name after acquisition

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1.0 INTRODUCTION

European Metal Recycling Limited (hereon referred to as EMR) are seeking a Bespoke Environmental Permit to operate as a non-hazardous waste treatment installation. It is the intention of EMR to operate a waste cable and waste metal processing facility falling under Section 5.4 Part A(1) activity – disposal, recovery or a mix of disposal and recovery of non-hazardous waste. The site's operations will involve the acceptance and treatment of non-hazardous material via shredders, magnets and granulators to separate copper and other non-ferrous metals from the plastics.

1.1 Demonstrating Operational Capacity

This document sets out the operational capacity and infrastructure in order to demonstrate adequate capacity to process the annual tonnage of non-hazardous material proposed to be processed at the facility.

2.0 TECHNOLOGY DESIGN AND ASSESSMENT

The following section outlines the designed capacity of the facility against the proposed annual tonnage allowance for material reception and processing.

2.1 Waste Reception

All incoming vehicles delivering material will enter the site entrance, which is located off Ferrous Road, and report to the weighbridge. The site plans to receive waste Monday to Friday (06:00 – 18:00) and Saturday (06:00 – 13:00) and plans to process received wastes for 365 days of the year, for 24 hours per day. To provide an accurate assessment, the site capacity assessment will utilise this figure.

2.2 Facility Design Capacity

Following acceptance onto site and unloading of the waste, it is subjected to a visual inspection by a site operative. The waste is to be stored in designated storage bays outside prior to processing. The separated materials are stored in dry woven bulk bags within the processing building prior to being sent off site. The maximum quantity of materials to be stored in the designated pre and post processing areas, and the maximum duration that the materials are to be stored are defined in Table 2 (Section 3.1).

2.3 Super Chopper and Electro Overband Magnet Assessment

All material received on site is passed through the super chopper. The purpose of the shredder is to reduce the particle size of the waste stream down to approximately 6" to 10". A calculation is provided below demonstrating the total annual capacity of the super chopper in tonnes of material per annum. The chopped material is passed through an electro overband magnet following the chopper on a conveyor and some manual sorting of ferrous material then takes place. The magnet removes up to 4% of the chopped material and the manual sorting removes up to 1% of the chopped material.

Equipment processing capacity per hour:	10 tonnes per hour
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 10 tonnes = 240 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 240 tonnes per day = 87,600 tonnes

2.4 Multi-purpose Rasper

All remaining material in the waste stream is then passed through a multi-purpose rasper. The purpose of the rasper is to reduce the particle size of the waste stream down to approximately 6" to 10". A calculation is provided below demonstrating the total annual capacity of the multi-purpose rasper in tonnes of material per annum. The chopped material is passed through another magnet to remove ferrous metals before being passed through a separator to remove stainless steel.

Equipment processing capacity per hour:	6 tonnes per hour
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 6 tonnes = 144 tonnes per day

Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 144 tonnes per day = 52,560 tonnes

2.5 Granulators

All remaining material in the waste stream is then passed through a pair of parallel granulators. The purpose of these is to reduce the particle size of the waste stream even further. A calculation is provided below demonstrating the total annual capacity of the granulators in tonnes of material per annum.

Equipment processing capacity per hour:	3 tonnes per hour per granulator
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 6 tonnes = 144 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 144 tonnes per day = 52,560 tonnes

2.6 Separation Tables

Once the waste has passed through the granulators, the material is temporarily stored in a silo before then passing through a pair of parallel separating tables, the purpose of which is to separate the plastics from the metals. A calculation is provided below demonstrating the total annual capacity of the separation tables in tonnes of material per annum.

Equipment processing capacity per hour:	3 tonnes per hour per separating table
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 6 tonnes = 144 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 144 tonnes per day = 52,560 tonnes

2.7 Split Waste Streams

Following the separation tables, the waste stream then splits. A small portion of the waste stream is fed back into the parallel granulators, however the vast majority of the waste is passed through one of the following processing mechanisms:

2.7.1 Additional Separation Table

Approximately half of the waste that is passed through the parallel pair of separation tables is then passed through an additional third separation table to further separate the plastics from the metals. The non-ferrous metals that are separated from the waste stream at this point are removed from the waste stream and stored prior to onward use/recycling. A calculation is provided below demonstrating the total annual capacity of the separation tables in tonnes of material per annum.

Equipment processing capacity per hour:	3 tonnes per hour
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 3 tonnes = 72 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 72 tonnes per day = 26,280 tonnes

2.7.2 Classifiers

The remaining waste stream from the pair of parallel separation tables which is not passed through the additional separation table or is not fed back into the granulators, is passed through a pair of parallel classifiers. The purpose of these is to further separate plastics from metals in the waste stream. The plastics that are separated from the metals in this waste stream are removed from the waste stream and are stored prior to onward use/recycling. A calculation is provided below demonstrating the total annual capacity of the classifiers in tonnes of material per annum.

Equipment processing capacity per hour:	1.5 tonnes per hour per classifier
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 3 tonnes = 72 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 72 tonnes per day = 26,280 tonnes

2.7.3 Turbo Mill

The classifiers successfully separate the vast majority of the remaining metal from the plastics. However, up to approximately 3% of the plastic that comes out of the classifiers still contains some metal. This stream of material is then passed through the turbo mill which serves to separate the ferrous metal, non-ferrous metal and plastics. A calculation is provided below demonstrating the total annual capacity of the classifiers in tonnes of material per annum.

Equipment processing capacity per hour:	0.5 tonnes per hour per classifier
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 0.5 tonnes = 12 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 12 tonnes per day = 4,380 tonnes

2.8 Assessment

As explained within the management system, the waste received on site will require processing through multiple sub-processes, including but not limited to, the chopper, granulators and separation tables as detailed above. The super chopper has the capacity to process 10 tonnes of waste per hour. The next processing plant on the process line with a limited throughput is the multi-purpose rasper which can process 6 tonnes of waste per hour. Although some waste is removed from the waste stream by the overband magnet and by manual sorting, items which are located between the chopper and the rasper, only up to approximately 0.5 tonnes of waste per hour is removed from the waste stream. Therefore, the throughput of the super chopper has to be limited to that of the rasper, plus the rate of waste removal by the overband magnet and manual sorting station i.e. 6.5 tonnes per hour. The capacities of all remaining parts of the process are sized in accordance with the process that precedes them i.e the rasper has a capacity of 6 tonnes per hour, the two granulators have a combined capacity of 6 tonnes per hour, as do the two separation tables which operate in series with the granulators. The third separation table has a capacity of 3 tonnes per hour and this removes non-ferrous metals from the waste stream. The two classifiers operate in series with the three separators and they have a combined capacity of 3 tonnes per hour which is sufficient to process the remaining waste stream from the three separation tables. Finally, the turbo mill has a capacity of 0.5 tonnes per hour which is sufficient to process the approximate 0.09 tonnes per hour of plastics containing metals that has been failed to be separated by the classifiers.

Therefore, the physical capacity of the process is that where there is a pinch point in the process. Here, this pinch point is at the multi-purpose rasper which can only operate at 6 tonnes per hour even though the super chopper which is located earlier in the process can operate at 10 tonnes per hour. As such, the physical capacity of the process is that of the multi-purpose rasper plus that of the waste removed from the waste stream prior to the rasper. The calculation is as follows:

Rasper processing capacity per hour:	6 tonnes per hour
Rate of removal from waste stream prior to rasper:	0.5 tonnes per hour
Expected operating hours per day:	24 hours (00:00 to 24:00)
Expected processing amount per day:	24 hours x 6.5 tonnes = 156 tonnes per day
Expected operating days per annum:	365 days
Capacity to be treated per annum:	365 days x 156 tonnes per day = 56,940 tonnes

Therefore, the physical capacity of the site is 56,940 tonnes per annum.

3.0 STORAGE AT ANY ONE TIME

The total amount of waste to be held on site at any one time is outlined in the sections below. This includes material at all stages of the process from reception, temporary storage awaiting processing and storage after processing prior to transfer off site. The processing throughput (tonnes per day) has been calculated for the maximum processing capacity.

Table 1 - Process Stage Tonnages

Treatment Process	Process Stage Tonnage
Super Chopper	240 tonnes per day
Multi-Purpose Rasper	144 tonnes per day
Pair of Granulators	144 tonnes per day
Pair of Separation Tables	144 tonnes per day
Single Separation Table	72 tonnes per day
Pair of Classifiers	72 tonnes per day
Turbo Mill	12 tonnes per day

3.1 Ancillary Storage

In addition to the materials that are actively being treated on site at any one time, there are ancillary storage areas on the site for materials awaiting processing or preparation for dispatch to final recycling outlets/end markets. These are identified in the table below.

Table 2 - Site-specific Ancillary Storage Arrangements

Pre-Processing Storage		
Storage	Stage Tonnage	Maximum Duration (Days)
20 Waste storage bays	520 tonnes	3
Separated metals	187 tonnes	3
Separated plastic	281 tonnes	3
Total	= 988 tonnes	N/A

3.2 Vehicle Movements

There will be vehicle movements on site across the year as a result of the reception and processing of the material. It is not envisaged that EMR will have any issue in dealing with the number of vehicle movements to be expected on site. The facility is located on a business park where vehicle movements are expected to be required as part of the individual site's operations.



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