

EPA Application Form

4. Activity and Capacity

4.3.4 - Storage of Waste - Calculations - Attachment

Organisation Name: *

Starrus Eco Holdings Limited

Application I.D.: *

LA005501

The figures presented in Attachment 4.3.3 – Storage of Waste/Non Waste of this application have been calculated based the existing waste acceptance and processing procedures, the proposed extension layout at the time of submission, and the proposed increase in annual waste intake. The maximum daily storage capacity is 12,000 tonnes.

The 2016 Duty and Standby Capacity Report is attached below. A revised Duty and Standby Capacity Report will be prepared and submitted as and when required by the Agency.

TITLE: REVISED DUTY AND STANDBY CAPACITY REPORT 2016

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1.0 OBJECTIVE

- 2016 Updated Provision of standby and duty capacity of plant critical to efficient processing of waste in response to the EPA requirements and referring to Waste License condition 3 and EPA comments as part of Compliance Investigation No. A013082
- STATUS: This report will supersede original duty and standby report when agreed by the Agency.

2.0 SUMMARY OF EPA REQUIREMENTS

The report shall take account of the licence requirement to maintain appropriate waste inspection and waste quarantine areas at all times (Condition 3.7).

The report shall include, but not be limited to, the following considerations:

1. Calculation of capacities based on floor space, processing (e.g., trommel/screen) capacity and bay capacity;
2. Treatment, storage and movement of raw waste, intermediate and final stage compost, as well as any "overs" (plastic and oversize material) and bulking agents.
3. Maintaining a suitable separation distance between waste stockpiles and vehicle/personnel doors.
4. Ensuring ready access to all emergency exits for facility personnel and visitors at all times.

3.0 Density of Materials through the process.

All calculations are based on a volume basis because the capacity of each area to store and/or process the material is determined by the volume area available. The density of the material being processed/stored can vary considerably over time (due to drying during composting process) as well as other factors discussed below.

Waste

The waste types that come in all have varying densities depending on the type of waste, season etc. The quantity of overs/woodchip needed to blend the waste will therefore vary considerably for example commercial food waste or domestic food waste collected in small kitchen caddies can be extremely wet (and dense) with a density approaching 1t/m³, while brown bin waste collected in larger bins can be very bulky and dry (this is particularly the case in the summer time when there is more hedge clippings in the waste) and has an estimated density of 0.6-0.8 t/m³.

All waste received is blended with amendment material (woodchip and/or 'overs') immediately upon arrival on site. It enters the primary processing bays with a density of approximately 0.6 t/m³

Woodchip & Recycled amendment 'overs'

The density of woodchip received is approximately 0.4 -0.5t/m³. This varies depending on the amount of fine sawdust material in the chip. The woodchip storage capacity is included in the total storage of recycled woody amendment 'overs' because woodchip is used to add to the total quantity of this material available for mixing. We receive woodchip to top-up the total quantity of this amendment material. If there is sufficient amendment in stock, we do not require woodchip and therefore have no storage capacity requirement.

The density of the 'overs' material is approximately 0.3-0.65 t/m³. The variance is to varying degrees of drying in the primary processing bays. Under ideal conditions the material will be drier coming out of the primary processing tunnels as this improves screening efficiency and compost production. The drier 'overs' leftover is also more beneficial for mixing the incoming waste.

Plastics/contaminants >80mm

Plastics/contaminants from the trommel have a density of approx. 0.5 - 0.7 t/cu.m prior further processing. This contains significant wood, branches, twigs and organic matter that pass through the trommel. The degree to which heavy organic matter is present varies depending on how dry the material being screened is.

Once the material is shredded and rescreened the density is reduced to approx. 0.2 t/m³.

Compost

Compost produced from the screening plant has a density of approx. 0.7 – 0.8 t/cu.m. This compost is then sanitised in the animal by-products, stored in a micro sampling storage area (where it is tested for E.Coli) and this then matured in the secondary processing area. During this time the density reduces to approx. 0.5 t/m³.

4.0 DUTY AND STANDBY CAPACITY

4.1 PLASTICS STORAGE AREA CALCULATION

On the facility floor, in front of the plastics discharge belt, there is enough capacity to store 342m³ (as per drawing)

In addition to this where a composting bay is used to store plastics this gives a further 30m x 5m x 3m = 450m³ capacity

Total storage capacity: 792m³ capacity

For shredding of plastics to take place the waste acceptance area must be cleared of all waste and No waste can be accepted. For this reason, shredding is usually carried out on a Saturday but in the event that it was planned to carry out shredding on a week day, all loads would need to be cancelled. Adequate floor space is required to store the shredded plastics prior to them being screened and placed back into the storage bay.

4.2 OVERSIZE STORAGE AREA CALCULATION

Oversize is produced continuously by the screening process. An ideal oversize material is dry, bulky and has good pore space. Overs are stored beside the composting tunnels. Oversize is mixed with incoming waste material. From week to week, all oversize is re-blended with incoming wastes. If there is an overproduction of oversize material due to wet bays, it is left to dry and is then rescreened and re blended. The volume of overs on any given day averages 580 cubic meters. Bulking agents such as Woodchip are blended with the Oversize pile.

This can include:

The Area in front of 5,6 7,8 and 9, 9B, 10 (212m²)

Total capacity 742m³

4.3 FRESH WASTE STORAGE AREA CALCULATION

Fresh waste received is immediately blended with overs/amendment on arrival on site and temporarily stored in the waste acceptance area before being loaded into one of the primary processing bays.

Waste Acceptance area capacity is 715.4 m³.

Total 395 m³ storage capacity. This equates to an intake tonnage of approximately 254tonnes.

4.4 PROCESSING (SCREENING) CAPACITY

A new screen was installed in 2012. The screen was designed by Turmec Engineering. The following describes how it functions and the throughput capacity.

Compost is removed from the composting tunnels and placed into the hopper of the belt feeder. The material is moved along the belt feeder and is discharged into the trommel feeder. The material is then conveyed up the trommel feeder into a Series 2 trommel, with the 0 to 80 mm materials being screened out. The +80 mm material (plastics and inert materials) is discharged onto the trommel discharge conveyor (or Plastics Belt) and conveyed to plastics storage area.

The 0-80 mm material then passes along the fines collection conveyor and onto the flip-flop feed conveyor before entering the flip-flop. The material passes over the screen where the 0 – 12mm fines are screened out and stored in a bay. The 12 – 80mm is also discharged into a bay, for stockpiling on the floor.

Currently the system screens a bay in an average 6 hour period. The design capacity of the screen is 60 tonnes per hour (with <60% Moisture Content).

A Composting tunnel can be screened and refilled and the oversize from the bay rescreened within 12 hours. We currently carry this routinely 6 to 8 times per week.

Our duty capacity requirement is to have a 45 tonne per hour screening system.

This includes the capacity to rescreen oversize and plastics.

4.5 COMPOSTING BAY TUNNELS

11 Preliminary Tunnels are located in the primary composting area. 1 bay is currently used for plastics so there is a total of 10 tunnels available for primary composting. Each tunnel processes an average of 150 tonne per bay of raw waste received. However this can vary depending on the waste type and pile height. (Current Bay capacity varies from 120 tonnes to 180 tonnes).

The current processing capacity of the facility is dependent on the availability of a bay for filling. This in turn is dependent on three variables:

1. The volume of waste which is processed in the bay
2. The retention time of the bay.
3. Number of bays screened per week.

Currently we screen 6-8 bays per week every week. This equates to a 9.63 –11.67 Day retention time in the bay and (based on 150 tonnes per bay) a duty capacity of 900 – 1200 tonnes per week.

The efficiency of screening depends on the composting tunnels being dry. Sufficient drying for screening to take place occurs within 7 to 8 days so 10 tunnels are available for screening each week. This equates to a maximum capacity for the primary processing tunnels of 1500 tonnes per week. This gives a standby capacity of 25%.

In the event that there is a large contract available to process, it is necessary to reduce the tonnage in one week to allow the extra capacity to be available the next week.

Each bay is filled with the waste from the same days deliveries ensuring that condition 6.3.6 is met.

4.6 ANIMAL BYPRODUCT TUNNEL REACTORS

We screen oversize and compost from the same tunnel batches and transfer these to the ABP bays. We screen 2 to 4 primary processing bay batches to produce each ABP batch. These currently pass on average within 3-5 days. The duty capacity of these bays

is estimated (we do not weigh the compost going into the tunnels) at 500 m³ per week. There is standby capacity to process another batch each per week. If a batch fails and has to be re done, there is capacity to process again in each bay. If these fail the compost is re-blended.

There is a 100% standby capacity.

4.7 MATURATION TUNNELS & MICRO SAMPLING STORAGE AREA & COMPOST STORAGE

1 maturation tunnel is filled every week.

Maturation Tunnels Capacity: 4 (tunnels) x 30 x 5 x 3.5 = 2,100 m³

Mico sampling storage area 15 x 5 x 3.5 = 262.5m³

Storage Area Capacity: 20.5 x 15 x 4.5 = 1,383.75m³

TOTAL Maximum Maturation capacity: 3483.75 (3746.25) m³ at any one time

1 tunnel per week = Duty Capacity of 525m³/Week

There is a standby capacity of approximately 42.7% if we were to process and dispatch compost in 5 weeks.

4.8 CRITICAL EQUIPMENT

CRITICAL EQUIPMENT	STANDBY CAPACITY	ADDITIONAL DETAILS	
Dirty Side Loader	Spare loader	We currently have 3 loaders. 1 operational in the clean side and 1 in the dirty side. The third loader operates as a backup for breakdowns, servicing etc.	



Clean Side Loader	Spare loader (100%)		
Motors, Conveyors, Bearings. All screening plant parts	(100%) Available from supplier Turmec within 8hrs		
Extraction Fan Motors/Fans	Available from supplier Redwood Systems. 3 day turnaround for motor.	Four No. Extraction fans are operate at 60% capacity. In the event that one fan is non operational the other fans can be turned up. In this way adequate extraction is maintained.	
Aeration Fans/motors	Available from supplier Redwood Systems. 3 day turnaround for motor.		

5.0 HEALTH AND SAFETY REQUIREMENTS

All site operators are instructed in safe pile construction. Piles are constructed with a gradient to eliminate the risk of material falling in an uncontrolled manner.

We are not aware of any HSA guidance with regards pile construction or height.