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O'Callaghan Moran & Associates
ENVIRONMENTAL MANAGEMENT FOR BUSINESS

OPERATIONAL REPORT

STARRUS ECO HOLDINGS LIMITED

BALLYBEG

LITTLETON

COUNTY TIPPERARY

Prepared For: -

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December 2020

Project	Operational Report			
Client	Starrus Eco Holdings Limited			
Report No	Date	Status	Prepared By	Reviewed By
191380701	01/05/2020	Draft	Billy Hamilton M.Sc.	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	23/02/2020	Final	Billy Hamilton M.Sc.	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA

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1. INTRODUCTION

Starrus Eco Holdings Ltd (SEHL) operates a composting facility in Ballybeg, County Tipperary under planning permission granted by Tipperary County Council, an Industrial Emissions Licence (Licence No: W0249-01) issued by the Environmental Protection Agency (the Agency) and an approval from the Department of Agriculture Forestry and the Marine (DAFM) under the European Union (Animal By-Products) Regulations (Comp 45).

The EPA licence limit the annual waste acceptance rate to 45,000 tonnes. It authorises the treatment of biodegradable wastes to produce a soil improver and the stabilisation of the organic fines produced from the processing of residual solid municipal waste. It is proposed to increase the annual waste intake to ca 80,000 tonnes. This will involve the extension of the composting building to provide additional primary, pasteurising and secondary processing capacity. SEHL is also applying to change the site boundary of the licenced area.

1.1 Scope

This report describes the design criteria and method of operation of the installation. It is based on the conditions in the current licence, the operational procedures prepared by SEHL and the information in the Environmental Impact Assessment Report (EIAR) that accompanies the review application. Following the grant of the revised licence this report will be amended to bring it into alignment with the conditions of the revised licence.

1.2 Annual Review

This report is subject to an annual review throughout the operational life of the installation to take account of operational experience, the progressive development of the facility, changes in regulatory requirements and developments in composting and waste processing technology and methodologies.

2. SITE DESCRIPTION & ENVIRONMENTAL SETTING

2.1 Site Location

The site is rural setting two kilometres south-east the village of Littleton, County Tipperary in the townland of Ballybeg (Figure 2.1). It is accessed by the L4101 local road. The R639 (formerly the N8) is 2.4 km and the M8 motorway is 3.2 km to the north-west.

2.2 Surrounding Land Use

The site is bounded to the west, north and east by willow plantation and to the south by agricultural fields. Most of the land surrounding the property is cutaway and reclaimed bog, beyond which are worked peatlands to the north-east and south. There is a former Bord na Móna peat briquette factory and a new waste plastic recycling plant operated by Advanced Environmental Solutions Ireland Ltd (AES) approximately 1.4 km to the south east of the site.

2.3 Population

The village of Littleton, the closest population centre, is approximately 2 km to the north-west. The closest residential properties are on the L4101, 300 m to the east and 432 m to the north-west respectively.

2.4 Hydrology

The regional drainage pattern is shown on Figure 2.2. The site is in the catchment of the Ballyley River which is approximately 120 m to the south. The Ballyley River flows from east to west and becomes the Breagagh River, which then flows north east, discharging into the Drish River approximately 7.1 km to the north west of the site. The Drish River joins the River Suir a further 680 m west of this point. There are several drainage ditches around the site that discharge into the Ballyley River.

2.5 Geology and Hydrogeology

The subsoils underlying the majority of the site comprise cut peat, which is approximately 1 m thick and is underlain by boulder clay, followed by sandy gravel and finally gravel. The depth to bedrock, which comprises a dark, shaly, limestone, is between 7.6 and 10.15 m.

The bedrock is a Locally Important Aquifer that is productive only in local zones (Ll). The aquifer vulnerability rating for the site is Moderate. The local direction of groundwater flow is expected to be southerly, generally in the same direction as the topography.

A hydrogeological assessment completed in 2007 included the installation and monitoring of three groundwater wells and an assessment of the water quality in the Ballyley River.

The groundwater had elevated ammonia, manganese and chromium levels. The ammonia and manganese were considered to be naturally occurring and associated with the bedrock type and the

peaty nature of the subsoil. Slightly elevated chromium was also detected in the surface water sample. As there were no local anthropogenic sources of chromium it was concluded that it was naturally occurring.

2.6 Designated Sites

The nearest Natura 2000 sites are the Lower River Suir SAC, which is approximately than 8.3 km to the west, and the River Barrow and River Nore SAC, which is 12.5 km to the east.

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Title:

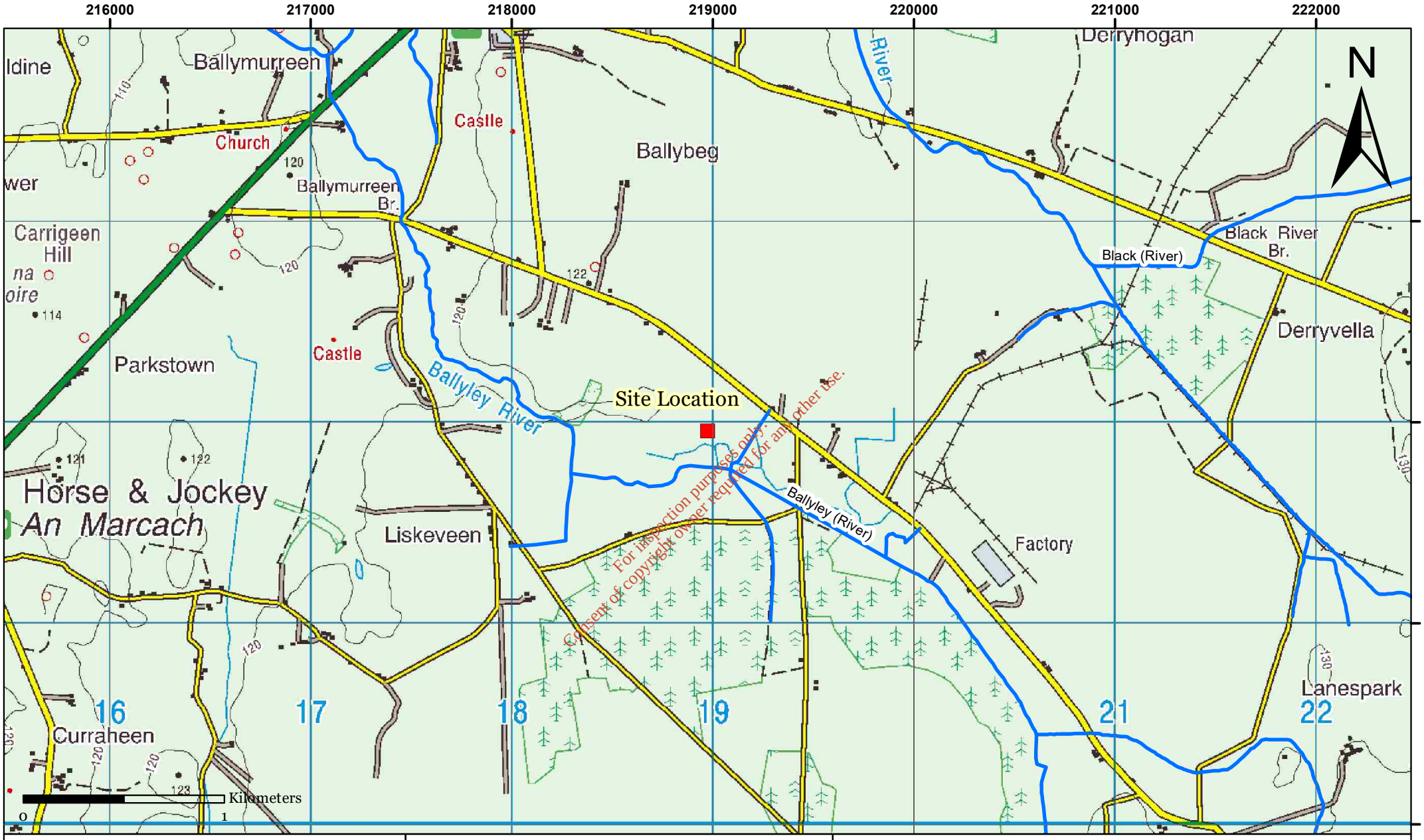
Figure 2.1 Site Location

Legend

-Site Location

Client:

Starrus Eco Holdings Limited



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Environmental Management for Business

CLIENT
Starrus Eco Holdings Limited

TITLE
Regional Drainage Pattern

Details:
- Site Location
- Rivers

Figure 2.2

3. SITE DESIGN

3.1 Site Layout

The site layout, when fully developed is shown on Drawing No. 18-173-300. The licence boundary will encompass 3.58 ha and includes the access road off the L4101; a weighbridge; the composting building (4,864 m^2); an annex on the northern elevation of the building that houses a fuel store, main control room, a mezzanine office and electrical substation; an odour control unit (biofilter) to the south of the building; a condensate holding tank bund; portakabin offices and welfare facilities at the northern boundary; a firewater reservoir lagoon; a firewater retention lagoon, paved yards and unpaved access roads. The licensed area is surrounded by a stock proof security fence as required by the DAFM Animal By-Product Approval.

3.2 Waste Processing Building

The building is divided into a primary processing area (also known as the 'dirty' area) and a secondary processing area (also known as the 'clean' area), as shown on Drawing No. 18-173-600. The primary processing area, when fully operational, will include the waste intake, twenty (20 No) aerated composting bays, a screening plant and four (4 No) Animal By-Product (ABP) pasteurisation bays. The secondary processing area, when fully operational, will house nine (9 No.) maturation bays and a finished product storage area. The existing and proposed primary and secondary processing bays are ca 30m long fitted with under floor aeration channels supplied by fans outside each bay.

3.3 Services

The site has connections to the main electricity supply and telecoms systems. Process water and water for the staff welfare facilities is obtained from an on-site well. There is no connection to the municipal foul sewer. Sanitary wastewater from the toilets is collected in an underground holding tank located in the northern yard. The contents are transferred by vacuum tanker to the waste intake area for composting.

3.4 Facility Roads, Access Roads & Hardstanding

The facility is accessed from the L4101 via a private roadway. The internal access roads and hardstanding are provided in accordance with Condition 3.4 of the current licence.

3.5 Site Buildings

All of the buildings are maintained in accordance with Conditions 3.5 and 3.6 of the current licence.

3.6 Waste Inspection and Quarantine Areas

The waste inspection and quarantine areas required under Condition 3.7 of the current licence are adjacent to the entrance to the main processing building.

EXISTING ROAD ENTRANCE TO FACILITY 1:500

EXISTING VEHICLE ENTRANCE, GATES, SIGHT LINES. AS GRANTED UNDER PLANNING REG. REF. 07511853. NO ALTERATION PROPOSED

2 m TALL PALLISADE SECURITY FENCING

SITE NOTICE

EXISTING 2 M TALL STEEL CHAIN LINK FENCING

SITE NOTICE

- SITE BOUNDARY
- GREEN AREA
- EXISTING CONCRETE YARD
- EXISTING GRAVEL DRIVE
- NEW GRAVEL DRIVE
- EXISTING BIO-FILTER
- WILLOW PLANTED AREA
- EXISTING TREES
- PROPOSED TREES
- EXISTING 2 M TALL STEEL CHAIN LINK FENCING
- PROPOSED 2 M TALL STEEL CHAIN LINK FENCING

EXISTING RIGHT OF WAY ACCESS TO BE KEPT CLEAR

EXISTING SURFACE WATER OUTLET AS PER PLANNING REG. REF. 07511853.

EXISTING 2 M TALL STEEL CHAIN LINK FENCING

EXISTING PRE-FAB BUILDING STAFF FACILITIES

EXISTING 2 M TALL STEEL CHAIN LINK FENCING

EXISTING TARMAC COVERED ROAD SURFACE

EXISTING 2 M TALL STEEL CHAIN LINK FENCING

OUTLINE OF POND TO BE RELOCATED

ADDITIONAL STAFF PARKING

EXISTING HOLDING TANK

EXISTING GRAVEL CAR PARK

BIKE STAND

EXISTING PETROL INTERCEPTOR

PROPOSED 2 M TALL STEEL CHAIN LINK FENCING TO MATCH EXISTING

CANOPY

LOADING DOCKS TO ENGINEERS DETAIL

EXISTING CONCRETE YARD

PROPOSED DEFINED WALKWAY

EXISTING POND

NEW POND

NEW 2 M TALL STEEL CHAIN LINK FENCING TO MATCH EXISTING

LAWN

EXISTING OPEN DRAIN

F.F.L=118.86m

PROPOSED DEFINED WALKWAY

PROPOSED EXTENSION

FLAT ROOF TO THIS SECTION OF THE BUILDING

PROPOSED EXTENSION

EXISTING WILLOW PLANTED AREA

NEW CONCRETE PATH

ROOF TOP GANTRY

EXTENSION TO BIO-FILTER

EXISTING BIO-FILTER

ACCESS STAIRS TO ROOF TOP GANTRY

NEW GRAVEL DRIVEWAY

NEW BIO FILTER CONDENSATE TANK TO ENGINEERS DETAIL

NEW CONCRETE PATH

NEW POND TO REPLACE EXISTING

EXISTING GRAVEL COVERED DRIVEWAY

EXISTING GRAVEL COVERED DRIVEWAY

FORM NEW GATE ACCESS TO WILLOW PLANTED FIELD

EXISTING MATURE HEDGEROW

EXISTING GATE AND 2 M TALL STEEL CHAIN LINK FENCING TO BE REPLACED

EXISTING OPEN DITCH TO BE PIPED. PIPE SIZE TO ENGINEERS DETAIL

PROPOSED SITE LAYOUT PLAN 1:500
SITE AREA BOUND IN RED: 3.58 HECTARES

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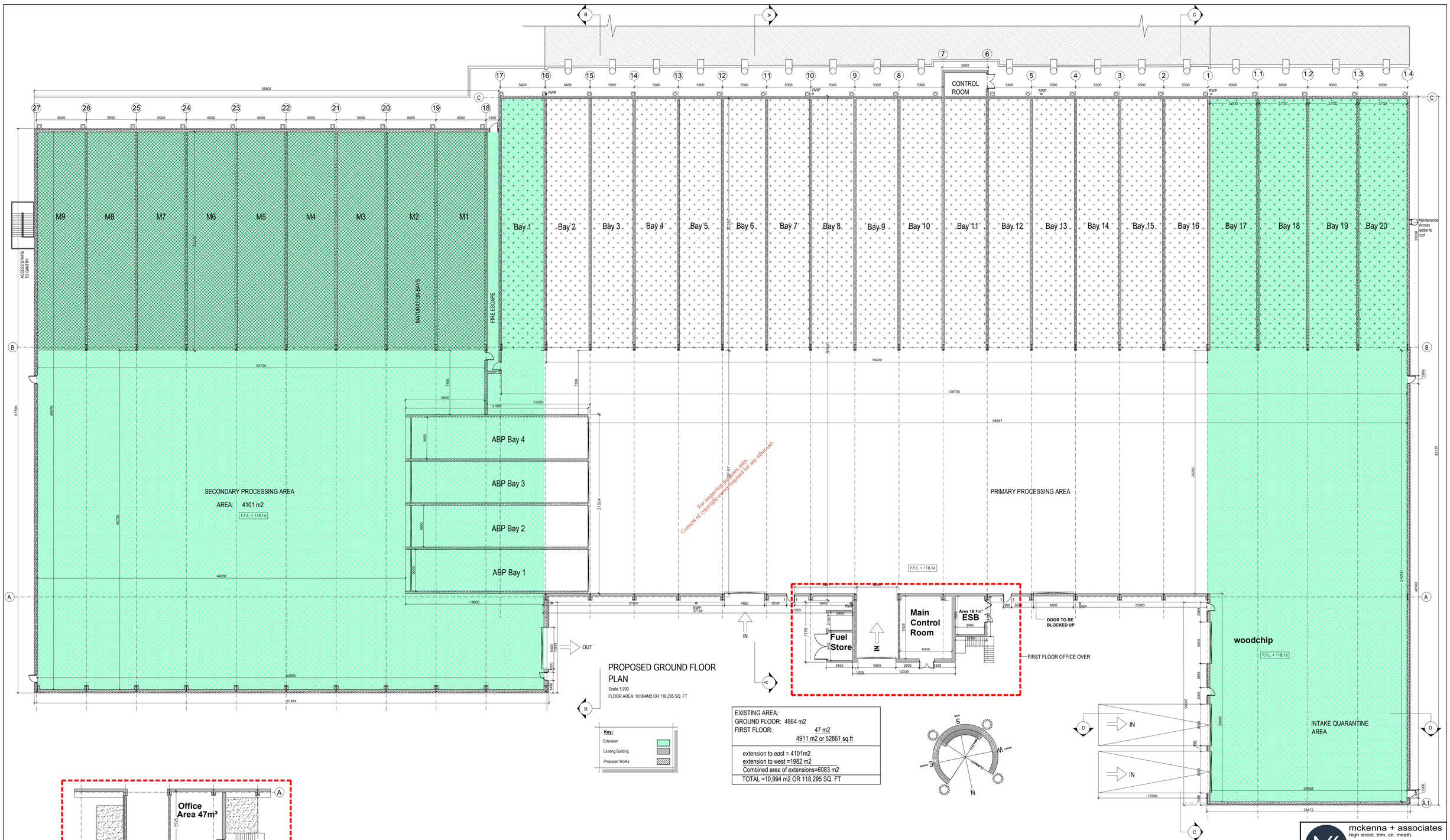
Client
ACORN RECYCLING

Project Title
EXTENSION OF RECYCLING PLANT AT
ACORN RECYCLING, BALLYBEG, LITTLETON, THURLES, CO. TIPPERARY

Drawing Title
PROPOSED SITE LAYOUT PLAN

Drawn By	Date	Scale
S.HUSSEY	24.04.2020	1:500 @ A1
Revision	**Drwg. Status**	**Drwg. No.**
	PLANNING	18-173-300



PROPOSED GROUND FLOOR PLAN

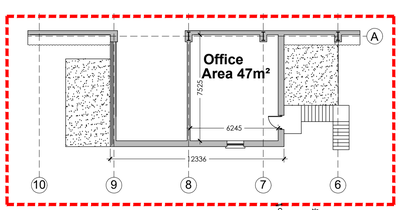
Scale 1:200

FLOOR AREA: 10,994M2 OR 118,295 SQ. FT

Key:
- Extension
- Existing Building
- Proposed Works:

EXISTING AREA:
GROUND FLOOR: 4864 m2
FIRST FLOOR: 47 m2
4911 m2 or 52861 sq.ft

extension to east = 4101m2
extension to west =1982 m2
Combined area of extensions=6083 m2
TOTAL =10,994 m2 OR 118,295 SQ. FT



FIRST FLOOR PLAN

Scale 1:200 AREA: 44.67M2

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Client
ACORN RECYCLING LTD

Project Title
EXTENSION OF RECYCLING PLANT AT
ACORN RECYCLING, BALLYBEG, LITTLETON, THURLES, CO. TIPPERARY

Drawing Title
PROPOSED FLOOR PLANS

Drawn By	Date	Scale
S.HUSSEY	24.04.2020	1:200 @ A1
Revision	**Drwg. Status**	**Drwg. No.**
	PLANNING	18-173-600

3.7 Wheel Cleaning

Wheel cleaning equipment is provided in accordance with Condition 3.9 of the current licence. Any waste water generated from the cleaning of wheels enters the process area surface water drainage system (see below).

3.8 Surface Water Controls

The treatment process does not generate a wastewater. The washwater from the vehicle wheel cleaning in the primary processing area is retained inside the building and absorbed by the incoming waste. Rainfall on the open topped biofilter accumulates in the filter media and is regularly removed and sent off site for treatment in an Irish Water wastewater treatment plant.

Rain water run-off from the northern section of the compost building and the paved northern yard discharges to a field drain at the northern site boundary via a silt trap and oil interceptor. The drain flows to the west and joins an unnamed tributary stream of the Ballyley River. The tributary joins the river approximately 750 m west of the site. Roof water from the southern section of the compost building discharges directly to a drain along the western site boundary. This drain flows to the south to join the Ballyley River.

There is a shut off valve upstream of the discharge point. In the event of an incident that has the potential to affect the quality of the run-off, for example a fire, the shut off valve is closed and the run-off diverted to the existing firewater retention pond in the north-west corner of the site.

3.9 Groundwater Controls

There are no direct or indirect emissions to ground. The most likely incident that could occur is an accidental discharge of oil or fuel either from the processing plant, or their associated storage tanks.

All waste activities are carried out internally within the main composting building. There is an annex on the northern elevation of the processing building that houses a fuel store, main control room, a mezzanine office and electrical substation and the area to the north of the compost building is paved.

The storage tanks are located within appropriately sized and constructed bunds, as per the Condition 3.17 of the current licence. Spill containment kits are provided and staff trained in their use.

3.10 Site Security

The operational area is surrounded by a 2m high chain link, stock proof security fence, with security gates at the entrance. The gates are locked at all times an only opened to allow vehicles to enter and leave the site. There are CCTV cameras at strategic locations across the site and out of hours remote monitoring is provided by a security company.

3.11 Monitoring Infrastructure

Sampling and monitoring points are clearly labelled and safe and permanent access is provided to all on and off-site locations, as required by Condition 3.16 of the current licence.

3.12 Fire Control

A Fire Risk Assessment has been completed for the facility and a copy of the report is in Appendix 1. The fire prevention planning includes:

- Control sources of ignition;
- Safe work practices in place for workers and contractors;
- Staff training;
- No smoking policy inside processing building;
- Maintenance and inspection programme;
- Security measures;
- Provision of emergency / quarantine area;
- Measures to reduce risk of self-combustion;
- Manage size and spacing of stockpiles;
- Monitoring of stockpiles;
- Appropriate fuel storage;
- Fire detection / alarms;
- Controls on vehicle exhausts, heating systems;
- Hot works permit system;
- Fire suppression – fire extinguishers, water lagoon and hose reels; and,
- Appropriate response in event of fire – Emergency Response Training.

Additionally, an Accident Impact Assessment has been completed that identifies the sensitive receptors that could be impacted by a major accident, and evaluates the likely impact on the sensitive receptors. The main findings are as follows:

- The only plausible potential major accident is considered to be a fire in the compost building.

- The only area where there is the potential for a fire to occur is inside the composting building, annex to the composting building where combustible materials are handled and stored, and the portakabin office/welfare facilities.

- The composting building has a span steel frame structure on top of 3 m high cast concrete walls topped with metal cladding. Internal fire walls minimise the risk of fire spread to the entire building.

- The Emergency Response Procedure (ERP) and out of hours security monitoring ensure a rapid response to a fire outbreak. A combination of the ERP and staff training ensures that the diversion valve on the surface water drains is activated to direct firewater run-off to the retention lagoon.

- The volume of firewater generated in the event of a fire is estimated to be 300 m^3. The firewater retention lagoon is 403 m^2 and approximately 1.5 m deep. The total storage capacity is 604 m^3; however as a precaution it is assumed that at the time a fire occurred 50% of the capacity is taken up by rainwater. This leaves a retention capacity of 302 m^3, which exceeds the estimated volume of firewater run-off.

- There is the potential for contaminated firewater to infiltrate to ground in unpaved areas; however, given type and thickness of the subsoils (1 m of peat and a minimum of 7 m of low permeability till) the risk of groundwater contamination is low.

- Given the distance between the compost building and the nearest residences it is unlikely a fire would require the evacuation of those houses, however a decision on this rests with the emergency services co-ordinator.

3.13 Fuel and Chemical storage

Diesel is stored in a 1,000 litre bunded tank in the bunded fuel store. Hydraulic oil, vacuum pump oil and grease used in the plant maintenance are also kept in the store.

4. OPERATIONS

4.1 Overview

The current licence authorises the acceptance of 45,000 tonnes of non-hazardous bio-degradable waste. These include;

- Wastewater Treatment Sludge, including sewage sludge,
- Food and Drink Industry Sludge,
- Source Segregated Food Waste (Brown Bin)
- Garden waste, and
- Organic fines from mechanically treated municipal solid waste (MSW).

The actual amounts of each waste type accepted can vary annually depending on market conditions. The current licence authorises the acceptance of other types of organic waste, subject to the Agency's prior approval.

It is proposed to increase the annual waste intake 80,000 tonnes. It is not proposed to accept any additional waste types to those already authorised, but approval is sought to retain the discretion to accept additional compatible organic wastes subject to the Agency's approval. As is the case at present, the actual quantities of the different waste types accepted annually will vary depending on market conditions.

4.2 Site Processes

4.2.1 Manufacture of Soil Improver

The process is static pile forced aeration composting and it takes approximately six weeks to complete. There are three treatment stages, primary processing, pasteurisation and secondary processing. To prevent cross contamination there is a strict separation between the primary and secondary processing stages.

In the primary stage the incoming materials are mixed with 'amendment' materials e.g. wood chip that enhance the flow of air through the material during the composting process and then placed in the primary composting bays.

The bays are formed by concrete walls, with roller shutter doors at the front. Once the bay is full temperature probes are inserted in the pile. These relay the temperature levels to a panel in the control room.

The bays have aeration channels in the floor that allow air to be distributed evenly through the pile and in these conditions the naturally occurring micro-organisms within the pile grow rapidly. The temperature levels are monitored and the aeration rate is varied as required until each batch has reached and maintained the optimum temperature of 60^0C. This usually takes between 7 and 8 days.

The piles are then removed from the bays and screened to reduce the particle size to 12mm. This takes out all non-organic materials (primarily plastics inadvertently placed in the brown bin) and 'overs' e.g. wood chip, which are returned to the waste in-take area for reuse in the process.

To comply with DAFM requirements on the treatment of waste that have the potential to contain animal by-products, the screened materials are moved to two ABP pasteurising bays where a temperature of 70°C is achieved and maintained for a minimum of one hour to kill any pathogens that may be present. This typically takes 3 to 4 days.

The pasteurised materials are then sent to the secondary processing area where curing or maturation occurs in the aerated bays for up to four weeks. The final product is stable and dry and is stored inside the building, before it is sent off site.

Schedule E of the EPA licence specifies a range of tests that must be completed on the final product to confirm it is suitable for use as a soil improver. SEHL carries out the relevant tests and maintains records for inspection by the EPA.

4.2.2 Biostabilistation

The purpose of the treatment is to stabilise the waste to meet the requirements of the Landfill Directive and the EPA licences issued to landfill operators. This stabilisation requires primary processing only and pasteurisation and secondary processing is not required.

4.3 Operating Procedures

SEHL has prepared a comprehensive set of Operating Procedures that cover all aspects of the day to day management of the installation and contingency measures. The procedures form part of the installation's Environmental Management System (EMS), which is required under Condition 2 of the current licence and are subject to regular review based on operational experience, legislative changes and improvements in best practice.

4.4 Site Management

SEHL has, in accordance with the requirements of the current licence, prepared a documented Environmental Management Programme (EMP) that serves as a guidance document for facility staff and describes operational control and management practices. All staff are provided with the appropriate and necessary training to complete their assigned tasks.

4.5 Operational & Waste Acceptance Hours

The waste acceptance hours are between 8.00 am to 7.00 pm Monday to Friday, and 8.00 am to 2.00 pm Saturday. The biological treatment is 24 hours a day, 7 days a week.

4.6 Access

The only access to the installation is via the main gate. The gates are locked at all times and only opened to allow vehicles to enter and leave the site.

4.7 Waste Types

The current licence authorises the acceptance of the non-hazardous bio-degradable waste listed in able A1 of the licence.

4.8 Waste Acceptance

All incoming waste is subject to a documented waste acceptance procedure (SOP ARB01). All deliveries arrive in fully enclosed vehicles that are weighed in at the weighbridge at site access road and the accompanying documentation is checked. The driver is then directed to the waste intake area.

An SEHL operative opens the door to allow the vehicle to enter the building and, when this has occurred, the door is closed. The wastes are off-loaded in a designated tipping area and inspected for unsuitable material. If any is identified, it is loaded directly back into the container/vehicle receptacle for removal off site. Once the waste has been inspected, the operative ensures the wheels and axle are washed to remove any debris prior to signalling the driver to leave the building.

4.8.1 Waste Collection Permits

Wastes are delivered by waste collectors that have up to date Waste Collection Permits. Wastes are not accepted from either members of the public, or commercial waste collectors that do not have a contract with SEHL.

4.8.2 Waste Characterisation

As required by Condition 8.1 of the current licence, the waste acceptance procedures provide for the off-site profiling, waste characterisation, preclearance, maximum contamination rates and characterisation of sludges and other non-municipal waste types accepted at the facility. The records of off-site profiling and characterisation are recorded.

4.8.3 Waste Inspection

All deliveries arrive in fully enclosed vehicles that are weighed in at the weighbridge at site access road and the accompanying documentation is checked. The driver is then directed to the waste intake area, where the wastes are off-loaded in a designated tipping area and inspected for unsuitable material. If any is identified, it is loaded directly back into the container/vehicle receptacle for removal off site.

4.8.4 Waste Records

Details of all waste deliveries, i.e. date and time of delivery, waste description including the LoW code, weight, waste producer details including vehicle registration, presence of hazardous or quarantined material, waste consignee details and waste source are recorded.

4.9 Compost & Biostabilisation Waste

Quality standards for both the compost and the biostabilisation waste are established in Schedule E: Standards for Compost Quality and Bio-Stabilisation, of the current licence.

In order not to be considered a waste, compost produced by the facility is required to comply with the Schedule E standards. Compost not meeting the standard set out in Schedule E of the licence is regarded as waste and, unless otherwise agreed by the Agency, is disposed of by incineration or by landfilling.

4.10 Plant & Equipment

The mobile plant include three front loading shovels to handle the waste. A jetting and suction truck is used to remove the biofilter water. The fixed screening plant comprises a hopper, feed conveyor, trommel and a flip-flow screen. A kerosene powered power wash (11 litres/minute) is used to clean the wheels of the waste delivery vehicles before they leave the primary processing area. There is a smaller power wash inside the entrance to the secondary processing area that is used to clean the vehicles exiting that part of the building.

4.11 Fuel & Chemicals

The maximum amount on site at any one time is given in Table 4.1.

Table 4.1 – On-Site Oil & Chemical Storage

Resources	Max at any one time
Diesel	1000 litres
Hydraulic Oil	200 litres
Kerosene	800 litres
Grease/Vacuum Pump Oil	100 litres

Oil spill containment and clean-up equipment are maintained at strategic locations around the site. Bund integrity testing is completed at 3-year intervals.

4.12 Health & Safety

SEHL has adopted an Accident Prevention Policy and prepared a Safety Statement that identifies and evaluates the major on-site potential hazards and describes the control measures in place. All site staff receive the appropriate training for their particular roles. All personnel and visitors are obliged to comply with site guidelines regarding access to and from the facility and on-site traffic movement. All site personnel are provided with and are obliged to wear, personal protective equipment (PPE) appropriate for their particular functions. PPE includes facemasks, gloves, safety glasses, steel-toed footwear, overalls, reflective jackets and helmets.

The current licence requires SEHL to ensure that an Emergency Response Procedure (ERP), which addresses any emergency/ incident that may occur and makes provisions for minimising the effects on the environment, has been prepared and communicated to all staff members.

4.13 Emissions

4.12.1 Surface Water

The emissions to surface water are rainwater run-off from the building roofs and access yards. This is weather dependent and periodic. The run-off from the northern section of the compost building and the paved yard at the front goes to a drain along the northern boundary. The run-off from the southern section of the roof goes to a drain along the western boundary.

4.12.2 Foul Sewer

The facility is not connected to the municipal foul sewer. Sanitary wastewater from the welfare facilities is collected in an underground holding tank. The contents are transferred to the waste intake area, mixed with the incoming waste and then composted.

4.12.3 Noise

The extraction and aeration fans are sources of continuous noise emissions. Waste transport vehicles, staff private cars and the mobile plant are sources of intermittent noise emissions occurring during the waste acceptance and processing.

4.12.4 Air

There are no fixed point emission sources associated with the operations. Potential fugitive emissions include odours, bioaerosols, dust and vehicle exhausts. Vehicle exhausts contain a range of compounds that affect air quality, for example carbon monoxide, methane, carbon dioxide, and particulates.

4.12.5 Ground & Groundwater

There are no direct or indirect emissions to ground and groundwater.

4.14 Emission Controls

4.14.1 Surface Water

Rainwater run-off from the northern half of the composting building and the paved northern yard is collected in a storm water sewer and passed through a Class I Oil Interceptor before discharging to a drain at the northern boundary. There is a shut off valve upstream of the discharge point. In the event of an incident that has the potential to affect the quality of the run-off, for example a fire, the shut off valve is closed and the run-off diverted to the existing firewater retention pond in the north-west corner of the site.

4.14.3 Noise

All waste reception, processing and storage is carried out inside the processing building. The only sources of noise generation outside the building are vehicle movements. Table B.3 of Schedule B of the current licence specifies day and night time noise emission limits.

4.14.4 Odours/Bioaerosols/Dust

As stated above, all waste acceptance and processing is carried out inside the processing building. Doors are kept closed and only opened to allow vehicles to enter and leave the building. The existing odour control system comprises an air extraction system that draws odorous air from inside the processing building and channels it to a biofilter which has a wood chip medium that supports a microbial population of bacteria and fungi.

The odour control system is designed to achieve an odour removal efficiency of >90% and meet the odour emission limits specified instable B.2 of Schedule B of the current licence for odorous compounds (ammonia, mercaptans and hydrogen sulphide). The biofilter is subject to a routine

maintenance programme and quarterly performance assessment that includes monitoring of pH, moisture content and the bacteria/fungi levels and the odour removal efficiency.

4.15 Nuisance Control

The site and immediate surroundings are inspected on a daily basis for nuisances caused by litter, vermin, birds, flies, mud, dust and odours.

4.15.1 Litter

SEHL implements the nuisance control measures specified in the current licence to mitigate the impacts of noise, dust, litter and odours and minimise the risk of site activities being a source of nuisance to neighbours and members of the general public.

4.16 Environmental Monitoring Programme

Schedule C of the current licence specifies the monitoring requirements for the facility as follows.

4.15.1 Emissions to Air

Table C.1.2, Table C.1.3 and Table C.2.3 of Schedule C specifies the monitoring requirements for emissions to air and for monitoring the performance of the odour control unit. The scope and frequencies are shown in Table 4.1.

Table 4.1 Emissions to Air Monitoring - Biofilters

Parameter	Monitoring Frequency
Dust	Bi-annually Note 1
Odour	Quarterly
Bacteria	Annually
Aspergillus fumigatus	Annually
PM_{10}	Bi-annually
Bed media	
Odour assessment	Daily
Condition and depth of biofilter	Daily
Moisture content	Bi-annually
pH	Bi-annually
Ammonia	Bi-annually
Total viable counts	Bi-annually
Inlet and outlet gas	
Ammonia	Bi-annually
Hydrogen sulphide	Bi-annually
Mercaptans	Bi-annually
Amines	Bi-annually
Ambient Dust	
Dust deposition	Monthly

Note 1: Twice during the period May to September, or as otherwise specified in writing by the Agency

4.15.2 Surface Water

Table C.2.1 of Schedule C requires bi-annual monitoring of the of the storm water discharge to the drain at the northern boundary for suspended solids and ammonia.

4.15.3 Noise

Table C.2.2 of Schedule C requires quarterly noise monitoring at two noise sensitive locations – NSL1 and NSL2.

4.15.4 Groundwater

Table C.2.3 of Schedule C requires annual groundwater monitoring for pH, nitrate, total ammonia, total nitrogen conductivity, chloride and organic compounds.

4.17 Incidents

An incident is: -

(i) an emergency;

(ii) any emission which does not comply with the requirements of this licence;

(iii) any exceedance of the daily duty capacity of the waste handling equipment;

(iv) any trigger level specified in this licence which is attained or exceeded;

(v) any indication that environmental pollution has, or may have, taken place.

In the event of an incident SEHL is required immediately:

(i) carry out an investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

(ii) isolate the source of any such emission;

(iii) evaluate the environmental pollution, if any, caused by the incident;

(iv) identify and execute measures to minimise the emissions/malfunction and the effects thereof;

(v) identify the date, time and place of the incident;

(vi) notify the Agency and other relevant authorities

SEHL has completed an Environmental Liability Risk Assessment (ELRA) as required by Condition 12.2.2 of the current licence that has identified the plausible risks associated with site operations, assesses the potential impacts linked to incidents and describes and costs the required remedial actions. The ELRA has been approved by the Agency.

4.18 Complaints

All complaints are recorded in a Complaint Record, as specified in Condition 11.9 of the Licence. The information recorded includes: -

- Date and time of the complaint;

- Name of the complainant;

- Details of the nature of the complaint.

The Facility Manager, or nominated Deputy Manager is responsible for its investigation and the implementation of any corrective measures. In the event that corrective actions are required SEHL records the actions and informs the complainant.

4.19 Annual Environmental Report (AER)

The scope of the AER is set out in Schedule F of the current licence. The preparation of the AER involves a review of the progress in achieving the Environmental Objectives and Targets, reports on site development works, resource consumption, changes to existing or introduction of new operating procedures and an assessment of the impacts of site activities.

4.20 Decommissioning

A Closure Restoration and Aftercare Management Plan has been prepared and approved by the Agency.

FIRE RISK ASSESSMENT AT ACORN RECYCLING FACILITY, BALLYBEG, LITTLETON, CO. TIPPERARY

Prepared for:

Acorn Recycling Ltd.
Ballybeg,
Littleton,
Co. Tipperary.

Prepared By:

John Rea, B.Sc. MIEnv.Sc.
Project Manager
JRE Ltd.

JRE
Environmental Consulting

3238
February 20th, 2017

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ARB-D01 – Standby Capacity Drawing – Emergency Exit Routes

ATTACHMENTS

1. INTRODUCTION

Acorn Recycling Ltd. (Acorn) operate a composting facility at Ballybeg, Littleton, Co. Tipperary. The site currently operates under an Environmental Protection Agency Industrial Emissions Licence (Ref. W0249-01). In June 2016 an amendment was made to the site Industrial Emissions Licence to include an additional licence Condition 9.5. Under the new Condition 9.5:

The licensee shall arrange, within six months of the date of this amendment and every three years thereafter or as directed by the Agency, for the completion, by an independent and appropriately qualified consultant, of a fire risk assessment for the facility. The assessment shall examine all relevant factors on site that impinge on fire risk and prevention. The assessment shall have regard to the EPA Guidance Note: Fire Safety at Non Hazardous Waste Transfer Stations, 2013 and the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016. Any recommendations in the fire risk assessment report shall be implemented by the licensee within twelve months of the date of this amendment.

This document incorporates a Fire Risk Assessment (FRA) for the Acorn facility prepared with reference to the EPA Guidance Note: Fire Safety at Non Hazardous Waste Transfer Stations, 2013 and *the* EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016. As part of the storage requirements for assessing fire risk from the storage of loose waste or compost piles on site the assessment was also prepared with reference with Appendix 1 of the 'Reducing Fire Risk at Waste Management Sites (Waste Industry Safety and Health Forum 2014)'. The scope of work completed for the fire risk assessment is provided below.

Site Description

Acorn Recycling Ltd. operates a composting facility at Ballybeg, Littleton, Co. Tipperary, for the aerobic composting of non-hazardous biodegradable organic waste (BMW) for the production of a Class 1 compost and the stabilisation of biosolids including organic fines produced from the mechanical processing of mixed municipal waste (MMW) and was originally licensed by the EPA in October 2009. The facility consists of one main Building that accommodates all site processing and a site administration office located above, but external to, the process shed. Site welfare facilities (e.g., canteen and washing / changing areas) are located in pre-fabricated units across the site yard from the process building. The process building is divided into three main areas:

1. Primary composting area (i.e., dirty end where feedstock is received, mixed and then processed in the composting tunnels).
2. The sterilization tunnels where material from the screened compost material (following primary composting) is sterilized to meet the requirements of the Animal by-Products Regulations; and
3. Secondary composting area after the sterilization process (i.e., maturation area where the compost material is stored and turned until it is biostabilized to create a compost product.

The process building construction is a steel portal frame design featuring 3m high reinforced concrete walls at the building base and galvanised steel purlins with steel clad panels on a structural steel portal frame. The process tunnels in the primary and secondary process areas have mass- concrete walls up to 3 m from the facility floor and then have blockwork from the mass-concrete wall to the tunnel roof. The roof across all process tunnels is a mass-concrete construction. The facility is located inside a security fenced area with CCTV coverage as an added security measure, see Drawing ARB D-04.

Site Operations and Facilities

The process building is divided into two separate areas consisting of a primary processing area (dirty area) and a post composting and sterilization area (clean area). Organic waste material is delivered to the waste acceptance area located in the primary processing area of the building. The material is mixed with a bulking agent (e.g., wood chip) if required and transferred to one of the eleven (11) primary composting bays for in vessel processing. Waste is processed in the composting bays for approximately 1 week. It is then transferred across to the feed hopper where it is double screened down to <12mm diameter. Any organic overs may be returned to the process for further processing and any residual plastics are removed at the fine screening stage and stored in a specified area at the end of the fine screen system. The fine compost material is transferred to the ABP bay where it is sterilized to meet the Animal By-Product Regulation requirements. Following the sterilization process the material is removed from the clean end of the ABP bay and placed in one of the four maturation bays in the clean area of the facility. The material is monitored until it is deemed to be biostabilized and matured. Once the material meets the criteria of a grade 1 compost it is stored in a dedicated storage bay for transfer off site for use as an organic fertilizer.

2. SCOPE OF WORK

The tasks completed in the scope of work for the preparation of the FRA for the Acorn facility were based on those outlined in Part 3 of the EPA Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, 2016 and included:

- Identification of existing and potential fire hazards;
- Assessment of fire risks inside and outside the facility building;
- Identification of existing fire control measures and recommendations on further reduction of fire risk;
- Assessment of fire prevention planning;
- Assessment of fire detection and warning systems;
- Assessment of fire-fighting systems in place on site;
- Recommendation for fire quarantine location in facility;
- Assessment of controls to limit fire spread on site;
- Assessment of security arrangements on site
- Access for emergency services in the event of a fire; and
- Preparation of a site plan showing fire-fighting and prevention systems, quarantine area, building layout, high risk areas and utility locations; and

For the preparation of this document the following guidance documents were referenced;

- Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, EPA, 2013
- Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities, EPA, 2016
- Fire Prevention Plans - Environment Agency, 2015
- Reducing Fire Risk at Waste Management Sites (Waste Industry Safety and Health Forum 2014) and Environment Agency Technical Guidance Note (TGN7.01).

3. FIRE HAZARD RISK ASSESSMENT

Fire hazard risk assessment was undertaken by completing a site walkover and inspection, including; observation of site operations, infrastructure and equipment, storage of compost, amendment material storage, screened waste material storage and site characteristics to assess potential fire risks associated with the site both internally and externally. Details of the fire risk assessment are provided below.

3.1. Potential Sources of Ignition and Combustible Material

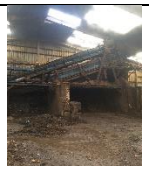
With reference to Chapter 2 of the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, 2013; the main sources of ignition at the Acorn facility were identified based on the site operations and materials handled on site observed during the site walkover completed on February 1st, 2017. A list of the potential sources of ignition are provided in Table B below.

Table B – Potential Ignition Sources

Ignition Source
Smoking
Vehicle Exhausts
Frictional generated heat from mechanical equipment
Poorly installed or maintained equipment motors
Static charge from conveyor belts
Faulty or misused electrical equipment
Light Fittings too close to stored waste
Obstruction of equipment ventilation
Heating of processing or maturing compost piles
Malicious ignition (arson / vandalism)

Combustible material on the Acorn site consisted of screened plastics, vehicle fuel, non-composted organics etc. that is stored on site. The combustible materials identified during the site walkover completed on February 1st, 2017 are outlined in Table C below.

Table C – Combustible Materials Observed on Acorn Site

Combustible Material	Location	
Diesel Fuel Storage Tank	Locked Storage shed immediately north of the primary process area. The shed is of concrete construction and connected to, but outside the main process shed.	
Kerosene / Diesel Storage Tank for Power-washer	Locked Storage shed immediately north of the primary process area. The shed is of concrete construction and connected to, but outside the main process shed.	
Screened Plastic / Orgainic mixed Material	Stored at end of trommel screen in southeast corner of primary processing area. Plastic material with residual organics is dried in process tunnel 1 for return back through the composting process.	
Organic oversized material and wood chip amendment material.	Screened off at trommel for return through the composting process. Wood chip may also be imported and stored on site if there is not sufficient overs material for blending with the organic feedstock prior to primary processing.	
Lubricating Oils	Stored in Locked Storage shed immediately north of the primary process area. The shed is connected to, but outside the main process shed. There are also oil containers stored in the electrical control room located beside the fuel storage shed.	
Paper and other materials in office	Site office located on a mezzanine level above the process shed. The site office is external to the process shed.	
Furniture	Wood desks and other furniture located in site office.	
Wood Chips	Wood chips are used in the biofilter located to the south of the processing building.	
Synthetic wall or ceiling covering	No synthetic covering observed on the wall or ceiling of the processing building.	

4. IDENTIFICATION AND ASSESSMENT OF ALL POTIENTAL FIRE RISKS

To assess the potential fire risk both inside and outside the facility the combination of ignition source, combustible material and presence of oxygen (fire triangle) were determined. The potential for fire was broken down into specific areas of the facility to provide an area based assessment of the site. The areas considered as part of the initial assessment were:

Internal Facility Building - Primary Processing

- Waste Reception Area
- Composting Tunnels
- Material screening area
- Screened plastics storage area
- Screened overs storage area

Internal Facility Building - Secondary Processing

- Maturation Tunnels
- Compost Storage Area

External Rooms Connected Facility Building and Yard Area

- Site Office
- Fuel Storage Shed
- Electrical Control Room
- BMS Control Room

Ancillary Buildings and Yard Area

- Welfare Facilities in Pre-fabricated Unit across yard from Process Building
- Wood Chip Biofilter
- Fire Suppression Water Pump and Generator

Potential High Risk Activities

- Hot works – cutting or welding

4.1. Initial Fire Risk Assessment

The Risk Associated with each area was scored based on the existence of the fire triangle and the likelihood of all three aspects being present at the same time to cause a fire situation. It does not include the fire controls in place at the site, this is discussed in the following sections and the revised risk assessment scores based on the inclusion of those controls are provided in Section 8

Likelihood	Severity		
	1	2	3
	2	4	6
	3	6	9

Internal Facility Building - Primary Processing		
FIRE RISK ASSESSMENT		
Risk Assessment Index No. **Acorn-01**		
Area/Activity	**Risk**	**Risk Rating**
01A - Waste Reception Area	Overheating of Material or ignition due to hot material in feedstock	Potential for ignition is low due to inspection of material at intake and high moisture content of material - **L1 x S2 = 2 - Low**
01B - Composting Tunnels	Overheating of Material and self ignition in tunnels.	Air, ignition source and fuel are available but severity would be isolated to individual tunnels **– L2 x S2 = 4 - Medium**
01C - Material Screening Area	Friction from belts or burnout of motors igniting fine dust material at screener	Air, ignition source and fuel are available with potential to spread if not detected **– L2 x S3 = 6 - High**
01D - Screened plastics storage area	Overheating of material and self ignition of pile. Friction from belts or burnout of motors igniting the material pile.	Air, ignition source and fuel are available with potential to spread if not detected **– L2 x S3 = 6 - High**
01E - Screened overs storage area	Overheating of material and self ignition of pile. Friction from belts or burnout of motors as source of ignition of the material pile.	Air, ignition source and fuel are available with potential to spread if not detected **– L2 x S3 = 6 - High**

Internal Facility Building - Secondary Processing		
FIRE RISK ASSESSMENT		
Risk Assessment Index No. **Acorn-02**		
Area/Process	**Risk**	**Risk Rating**
02A - Maturation Tunnels	Overheating of Material and self ignition in tunnels.	Air, ignition source and fuel are available but severity of any fire would be isolated to individual tunnels **– L2 x S2 = 4 - Medium**
02B - ABP Tunnels	Overheating of Material and self ignition in tunnels.	Air, ignition source and fuel are available but severity of any fire would be isolated to individual tunnels **– L2 x S2 = 4 - Medium**
02C - Compost Storage Area	Overheating of material and self ignition of large compost pile.	Air, and fuel are available but limited potential for ignition source in area. Material is isolated from other areas of building by bunker walls and distance **– L1 x S2 -= 2 - Low**

External Rooms Connected Facility Building and Yard Area		
FIRE RISK ASSESSMENT		
Risk Assessment Index No. **Acorn-03**		
Area/Process	**Risk**	**Risk Rating**
03A - Site Office	Electrical fire due to overheating or power surge or malicious intent.	Air, potential ignition source and fuel are available but likelihood is low and severity of any fire would be limited **– L2 x S2 = 4 - Medium**
03B - Fuel Storage Shed	Cigarette discarded at shed or malicious ignition of fuel.	Air, limited ignition source and fuel are available but severity of any fire would be isolated to the shed due to construction **– L3 x S2 = 6 - High**
03C - Electrical Control Room	Overheating of electrical panels or power surge burn out equipment and cause fire in control room.	Air, and potential ignition source are available but limited fuel source in area. May be low potential for spread to adjacent fuel storage shed **– L2 x S3 = 6 - High**
03D - BMS Control Room	Overheating of electrical panels or power surge burn out equipment and cause fire in control room.	Air, and potential ignition source are available but limited fuel source in area.**– L2 x S3=6 - High**

Ancillary Buildings and Yard Area		
FIRE RISK ASSESSMENT		
Risk Assessment Index No. **Acorn-04**		
Area/Process	**Risk**	**Risk Rating**
04A - Welfare Facilities in Pre-fabricated Unit across yard from Process Building	Electrical fire due to overheating or power surge, malicious ignition or cooker fire in canteen.	Air, potential ignition source and fuel are available but likelihood is low and severity of any fire would be limited to welfare building **– L2 x S2 = 4 - Medium**
04B - Wood Chip Biofilter	Hot pockets in wood chip in biofilter if proper air distribution not maintained. Burnout of motors or fans in air extraction system during dry weather conditions.	Air, limited ignition source and fuel are available but severity of any fire would be isolated to the biofilter which is isolated from the facility building **– L2 x S2 = 4 - Medium**
04C - Fire Suppression Water Pump and Generator	Burnout of electrical wiring related to the pumps or backup generator.	Air, and potential ignition source are available but limited fuel source in area. Would be low potential for spread due to isolated distance from rest of site **– L2 x S1 = 2 -- Low**

Ancillary Buildings and Yard Area		
FIRE RISK ASSESSMENT		
Risk Assessment Index No. **Acorn-05**		
Area/Process	**Risk**	**Risk Rating**
05A – Hot Works including cutting and welding throughout the facility	Ignition source from sparks or hot slag may cause flammable material to burn causing risk to personnel and property.	Air, potential ignition source and fuel are available but likelihood is medium and severity of any fire could be high as it could potentially start anywhere in facility **– L3 x S3 = 9 - High**

5. FIRE PREVENTION PLANNING

5.1. Fire Prevention Measures

Fire prevention measures at any site are designed to meet three main objectives:

- minimise the likelihood of a fire happening;
- aim for a fire to be detected and extinguished as soon as possible; and
- minimise the spread of fire within the site and to neighbouring sites.

The fire prevention measures at the Acorn Recycling facility are based on those preventative measures outlined in Chapter 2 of the EPA Guidance Note: Fire Safety at Non-Hazardous Waste Transfer Stations, 2013. The preventative measures employed by Acorn Recycling were observed during the site walkover completed by JRE on February 1st, 2017 and are provided in Table D below.

Table D – Fire Prevention Measures

Activity	Fire Prevention Measure
Control Sources of ignition	The control of potential ignition sources on site are: • All motors and fans associated with the air extraction system are located outside the main process shed on a concrete wall and are isolated from the biofilter. • The trommel screen is inspected and cleaned on a regular basis with preventative maintenance completed to reduce potential for burnout of motor or ignition of fine dust. • Vehicles are parked away from potential flammable material.
Ensure Staff and contractors follow safe working practices when undertaking hot works.	If welding or cutting works are taking place, if possible it will be completed away from any combustible material. If the work must be completed inside the facility building then a hot works permit must be obtained prior to the work being completed, see Attachment 1. The staff member or contractor must have a heat shield in place to avoid sparks or hot slag providing ignition. Also, a fire extinguisher must be in place at all times where hot works are being completed. Hot works permits are required for all hot works undertaken in the Acorn Recycling facility. It is also a requirement to revisit the work area at 30 minute and 60 minute intervals to ensure hidden sparks have not started to smoulder. It is also a requirement to ensure that no hot works are completed near the end of day to avoid a situation of inspection not being carried out.
Ensure Training for Personnel on site	Acorn Recycling provides training for all new and existing staff, including: • Fire fighting equipment awareness and safe use • Emergency Evacuation Drills • First Aid. A record of operative training is filed in the site office as part of Acorn's ISO18001 compliance.
Ensure that visitors are aware of correct safety and fire prevention procedures while on site.	All visitors are escorted on site by a member of staff and are advised of proper safety and fire prevention procedures as necessary. Signage confirming all visitors must report to Reception located in main Office along with signage confirming no unauthorised entry allowed into the facility.
No smoking policy inside the facility	Acorn Recycling have a no smoking policy at the facility with the exception of a designated smoking area located outside the canteen room located across the yard, south of the main facility building.

Activity	Fire Prevention Measure
Regular maintenance and inspection programme and ensure good housekeeping.	Acorn Recycling have a regular preventative maintenance schedule and daily and weekly cleaning programmes in place for all process and mobile equipment on site, see Attachment 2. The process equipment is maintained and serviced by Acorn Recycling staff as per the manufacturers instructions. The floor of the facility is regularly cleaned to remove any residual waste material that could be a fire hazard.
Security Measures	The Acorn Recycling facility is located within a secure site with security fencing, The site is manned 24 hours per day for 6 days per week so reaction time to any fire incident would be very rapid. The site also has 12 CCTV surveillance cameras linked to the Netwatch system. The main gate is locked and can only be opened using the code pad (codes are strictly controlled) or by ringing a correct number from a pre-approved telephone number.
Appropriate firefighting equipment available including all vehicles fitted with fire extinguishers	All mobile equipment at the Acorn Recycling facility have fire extinguishers fitted in the vehicle cabs and personnel have been trained in their use. In addition, Acorn Recycling has located fire extinguishers at the main entrances and exits to all buildings and there is a centralised fire water suppression system whereby 3 fire hoses located at the main process building are connected to a pumped water suppression lagoon. There is a standby generator in place at the lagoon in the event of power failure to the pumps.
Provision of an emergency / quarantine area.	At all times during operations inside the composting facility the centre of the process shed is kept clear to ensure that access is maintained to the screened compost and screened overs at the screening plant, the screening plant feed hopper, the reception area, the animal by-products tunnels and the primary processing tunnels. Access to these areas is essential for the facility to function. In an emergency fire situation this open floor area that allows access to these areas would be available to act as a fire quarantine area, as normal operations would cease. In the event of a fire within one of the composting tunnels the maximum volume of material that would need to be removed would be 450 cubic meters. The area available on the concrete floor in the centre of the process shed will have a minimum floor area of 300m^2 at all times which would provide capacity to quarantine up to 900 cubic meters of material, assuming pile height of 3 meters, see Drawing ARB-01. However, as each of the composting tunnels are fully separated by a firewall, a fire in more than one of the composting tunnels at the same time is considered extremely unlikely. In the unlikely event of widespread fire in the plant (involving more than one composting tunnel), material could be removed from inside the facility onto the concrete yard at the front of the building. In this event the surface water from the yard would be diverted to the fire water retention pond, to prevent any discharge of contaminated run-off, see Drawing ARB-D04.
Put measures in place to reduce risk of self-combustion	Due to the consistent monitoring completed at the facility and the ability to control the core temperature of process piles through air introduction, the potential for the material to reach temperatures whereby they could ignite is considered low. Also, the moisture content of the material is between 40-60% and would not be readily conducive to ignition.
Manage size and spacing of stockpiles	A review of waste storage is included in Section 7 of this document.
Consider Enclosing stockpiles / stacks	All stockpiles of feedstock and compost material are stored in designated concrete tunnels. The concrete walls and roof act as a physical fire break between each tunnel. Matured compost is stored in a designated concrete bay area in the Secondary process area and is isolated from the maturation tunnels.
Monitoring of Material Stockpiles to prevent overheating / combustion	All material stockpiles are stored in the facility buildings which are enclosed and allow for monitoring and fire controls. The temperatures of all process stockpiles are constantly monitored to ensure that the core temperatures do not reach levels whereby they may be an ignition source. The temperatures within the stockpiles are controlled by increasing or decreasing air flow through the tunnels. Temperature checks on stockpiled compost material

	in the secondary processing area is completed with regular turning of the material completed to reduce core temperatures if required.
Fuel Storage	All fuel was located in a locked dedicated storage shed. The security on the shed reduces the potential for unauthorised access . The shed is constructed of materials (concrete) that would not readily burn.
Fire Detection	A fire alarm system is installed on site. The system includes linear heat cables and brake glass units in the composting building and smoke detection in the offices. The system gives an alarm onsite and gives test messages alerts to Acorn management. There is also a fire suppression system in the control room and BMS room. The alarm system and fire suppression is maintained quarterly by Firecrest Safety Systems Ltd and records are held in the inspection/maintenance folders in the Acorn office.

5.2. Ignition Source Prevention

Based on the site inspection completed at the Acorn Recycling facility on February 1st, 2017 the controls outlined on Table E were observed to be in place to minimise and prevent ignition potential on site.

Table E: Ignition Sources and Fire Control Measures

Ignition Source	Control Measure
Smoking	Acorn have a strict no smoking policy inside the facility building. Anybody smoking must do so at the designated area outside the canteen located on the opposite side of the yard from the facility building.
Vehicle Exhausts	Vehicles are not parked close to flammable material to avoid potential ignition and vehicles are parked in a designated safe area during out of hours. All vehicles have fire extinguishers in cab and all personnel have been trained in used of fire extinguishers.
Heating Systems	No heating in the process building. Only electrical storage heaters in site office and welfare facilities.
Hot Works	Hot works permits are required for all hot works undertaken in the Acorn facility. It is also a requirement to revisit the work site at 30 minute and 60 minute intervals to ensure hidden sparks have not started to smoulder. If welding or cutting works are taking place, if possible it will be completed away from any combustible material. If the work must be completed in the proximity of combustible material it shall be ensured that the staff or contractor has a heat shield in place to avoid sparks or hot slag providing ignition. Also, a fire extinguisher will be in place at all times where hot works are being completed.
Frictional generated heat from mechanical equipment	Frequent preventative maintenance and servicing on process equipment prevents wearing of bearings etc. that may give rise to frictional generated heat. Scheduled cleaning of process equipment removes any flammable material from the equipment.
Poorly installed or maintained equipment or electrics	Equipment and electrical fittings are only installed and maintained by fully trained and certified technicians / electricians and maintained in line with manufacturers guidelines. A record of maintenance is maintained on site.
Static charge from conveyor belts	Frequent preventative maintenance and servicing on process equipment prevents wearing of belts or belt slipping on equipment. Conveyors are constantly monitored by the operative clearing out screened material and a heat line is in place over the trommel to detect any potential ignition situation.
Faulty or misused electrical equipment	All electrical equipment and fittings are installed repaired and maintained by a qualified electrician with appropriate certification.
Light Fittings too close to stored plastic waste	Screened plastic waste is stored at the end of the trommel screen before being transferred into Tunnel 1. The material is stored no more than 3 metres from the floor of the facility. Light fittings are approximately 12 meters from floor surface.
Obstruction of equipment ventilation	A walkway is maintained around process equipment. This will prevent the storage or placement of objects within close proximity of the equipment that could block ventilation and cause overheating.
Spontaneous ignition of organic waste material	Compost material in the process tunnels are monitored for temperature on an ongoing basis. The material is typically has a moisture level of between 50% and 60% and is not readily combustible. Each process tunnel operates on a forced air system whereby the volume of air forced through the process tunnels can be increased or decreased to achieve optimum composting conditions. The constant monitoring of the process tunnels allows for the core temperature to be controlled to no higher than 78°C by adjusting the volume of air forced through the pile. The typical core temperature in each process tunnel is approximately 70°C which is not considered high enough to cause spontaneous ignition. A fire line is in place across the top of the entrance to each process tunnel to warn of any potential fire situation. The fire line is connected to the on-site fire alarm system.

Ignition Source	Control Measure
Spontaneous ignition of screened plastic material	Plastic material is screened from the incoming feedstock in the primary processing area. This material is mixed with some residual organic material. The plastic/organics material is piled at the end of the trommel screen in front of process tunnel 1 and is then transferred to tunnel 1 for drying. The process tunnel is monitored for temperature on an ongoing basis to ensure that temperatures do not reach levels whereby the material may ignite. The tunnel operates on a forced air system whereby the volume of air forced through the tunnel can be increased or decreased to achieve optimum temperature conditions. The constant monitoring of the process tunnel allows for the core temperature to be controlled by adjusting the volume of air forced through the pile thereby minimising the potential for spontaneous ignition..
Ignition of fine dust at trommel screen	The material in and around the trommel screen is monitored by the operative operating the mini digger that cleans the fine material from under the screen. As well as ongoing removal of fine screened material there is scheduled cleaning of the trommel on a daily basis to remove all fine dust from around motors and other potential ignition sources.
Housekeeping	At the end of each shift housekeeping tasks take place, this involves the clean down of plant machinery such as conveyer belts and shredders as well as a wash down of the mobile plant machinery
Malicious ignition (arson / vandalism)	The facility is located within a secure site with personnel on site 24 hours per day, 6 days per week and also has security and CCTV surveillance. All doors are locked when the facility is not manned to restrict access.

5.2.1. Persons at Risk

Based on the day to day operations at the Acorn facility the main persons at risk are the facility employees and delivery drivers that service the facility on a daily basis. The main risk to people in the facility is from fire but there may also be significant risk to people's health from smoke related to the fire.

5.2.2. Fire Detection

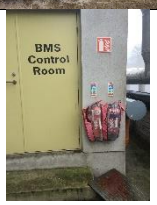
Acorn have a fire alarm system in place at the facility. The primary and secondary processing areas have heat cable lines in place for detecting fire situations in the main process areas. There are also break glass units in place at the site emergency doors and in the site office. There are also smoke detectors in place in the site office. The fire detection system is linked to an on-site alarm system and also to a text alert system to site management.

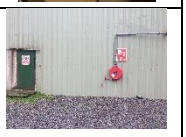
The fire alarm system is serviced and maintained by Firecrest Safety Systems and all service callouts are recorded and filed in the site office as part of the ISO18001 compliance.

6. FIRE FIGHTING PROVISIONS

On-site fire suppression measures include three fire hose reels inside and outside the main process building. The site has a dedicated fire suppression water lagoon connected to the fire hoses that can be used in the event of a fire, the location of the lagoon is outlined on Drawing ARB D-04. In addition to the fire hydrants there are a number of fire extinguishers located within the process building and ancillary rooms and facilities on site. All mobile equipment working in the facility have fire extinguishers in the cabs and all personnel have been trained in the use of this fire-fighting equipment. The fire alarm and suppression equipment located at and immediate to the Acorn facility are outlined in Table F. The service certificate for the fire extinguishers at the Acorn facility is provided in Attachment 3.

Table F – Fire Suppression and Alarm Equipment at Acorn Facility

Fire Fighting Equipment	Location	
2 Dry Powder Fire Extinguishers	Located on south wall beside BMS Room for suppression of fires related to the 14 air extraction unit motors	
2 Dry Powder Fire Extinguishers	Located beside door of BMS Control Room located at the rear (south) of the processing building.	
1 Dry Powder and 1 CO_2 Fire Extinguisher	Located on front of process building on wall beneath steps to the site office	
2 Dry Powder Fire Extinguishers	Located on front of process building on wall between the fuel storage shed and the electrical control room.	
3 Dry Powder Fire Extinguishers	Located in cab of mini-excavator and front loader operating in the primary processing area and in the cab of the front loader operating in the secondary processing area.	
1 Dry Powder Fire Extinguisher & Fire Alarm (break glass unit)	Located inside pedestrian entrance / exit door on front (south) wall of secondary processing area.	
Centralised dry powder suppression system	Located inside the electrical control room.	
1 foam and 1 CO_2 Fire Extinguisher Fire Alarm (break glass unit)	Site Office	

Fire Fighting Equipment	Location	
1 Dry Powder Fire Extinguisher and 1 Fire Blanket	Site Canteen	
Fire hose connected to centralised fire suppression system water lagoon.	Located outside pedestrian entrance / exit door on southeast wall of processing building (primary processing area).	
Fire hose connected to centralised fire suppression system water lagoon.	Located outside pedestrian entrance / exit door on west wall of processing building (Secondary Processing Area).	
Fire hose connected to centralised fire suppression system water lagoon.	Located inside processing building at entrance to processing tunnel 10 (Primary Processing Area) and inside the emergency door.	
Fire Alarm (break glass unit)	Located outside pedestrian entrance / exit door on west wall of secondary processing area.	

In the event of a major fire at the facility the alarm system will alert the Thurles Fire Service at Brittas Road, Gortataggart, Thurles that will have a response time of approximately 20 minutes.

7. MATERIAL PROCESSING AND STORAGE - FIRE BREAKS

7.1. Storage Walls/Storage Bays

A review of the suitability of process and storage bays (and dividing walls) was completed assess if they would limit fire spread. This included whether the walls were of robust and imperforate construction, if they are constructed to inhibit fire spread and if they possess the capacity to withstand knocks from plant and machinery.

7.1.1. Processing Tunnels

All process tunnels located in the primary and secondary processing areas of the facility building consist of a mass concrete wall to approximately 3m high, this is to provide a robust wall structure that will not be damaged by process equipment transferring material in to, and out of, the processing tunnels. Above the mass concrete the remainder of the tunnel walls are then concrete blockwork construction to the roof of each process tunnel. The roof of the process tunnels is a concrete slab construction which effectively isolates each process tunnel from the one beside it. The construction of the tunnels provides a physical fire barrier between each process tunnel that would ensure that any fire event in a processing tunnel would be localised to that bay only.

7.1.2. Freeboard

The process and storage areas were inspected to ensure that adequate freeboard existed to prevent overtopping of waste material over bay walls and over spilling of waste material beyond the sides of bay walls. The standard operating procedure on site is that the maximum height that material in any tunnel is piled to is 3 m. The construction of the tunnels allows for significant freeboard in each tunnel and encloses each process area so that they are stand-alone and material will not cross-over between process areas.

7.1.3. Processing Tunnels

Each processing tunnel holds approximately 150 tonnes of feedstock at any one time which is at a height of approximately 3 metres from the facility floor. The height of the processing tunnels are approximately 6 meters tall allowing 3 meters of freeboard within each tunnel. The construction of the tunnels is such that they are all fully separated by concrete walls and there is no chance of overtopping the tunnels or over-spilling of materials beyond the bay walls.

7.1.4. Screened Material

The areas beneath the trommel screen were clear on the day when the site walkover was completed. Each area for the separation of various fraction sizes are separated by concrete walls and the material is continuously removed to avoid build-up of material beneath the screens, see Plates 1 & 2 below.

Plate 1: Removal of Screened material

Plate 2: Divisions between screened Material Areas

7.2. Stockpiles Sizes

Appendix 2 of the Reducing Fire Risk at Waste Management Sites (Waste Industry Safety and Health Forum 2014) guidance document is concerned with the maximum allowed stack sizes and minimum separation distances between wastes stored internally. Stack sizes for internally stored waste (e.g., organic waste) are provided in Table 1 of Appendix 2 of the guidance document. This table is re-created below as Table G.

Table G – Internal Stockpile Sizes

Parameter	Standard	Commentary
Maximum floor area for internal individual stacks	300 m^2	No maximum length or width, but overall must be 300m^2 as a maximum. For example, an individual stack 15 m wide and 20 m long would comply.
Maximum height of stacks	5 m for loose storage 4 m for baled storage	These maximum stack heights also apply to bunkered / enclosed storage of waste
Minimum distance between individual stacks*	5 m	Or, provision of an adequate firewall between stacks, such as with bunkered / enclosed waste storage – the walls of such bunkers / enclosures must be to an appropriate standard.

Taking the above guidance as a conservative guideline the storage areas within the Acorn facility were assessed and are included on Table H below.

Table

Area Ref.	Floor Area	Max Stockpile Height (m)	Volume for storage area (m^3)	Fire Break
Primary Processing Area - Composting				
Plastics Storage	114 m^2	3	342 m^3	Facility Floor – open area separated from other material by approximately 2 metres
Bay 1	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 2	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 3	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 4	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 5	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 6	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 7	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 8	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 9	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 9B	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 10	150 m^2	3	450 m^3	Concrete Separation Wall
Storage Bay 1	150 m^2	3	450 m^3	Concrete Separation Wall
Storage Bay 2	150 m^2	3	450 m^3	Concrete Separation Wall
Overs Storage Area	212 m^2	3.5	742 m3	Concrete Bunker – separated from other material by approximately 3 metres
ABP Sterilization Area				
ABP Bay 1	150 m^2	3.5	525 m^3	Concrete Separation Wall
ABP Bay 2	150 m^2	3.5	525 m^3	Concrete Separation Wall
Secondary Processing Area - Maturation				
Bay 11	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 12	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 13	150 m^2	3	450 m^3	Concrete Separation Wall
Bay 14	150 m^2	3	450 m^3	Concrete Separation Wall
ABP Quarantine	75 m^2	3.5	262 m^3	Concrete Bunker
Product Storage	307 m^2	4.5	1,384 m^3	Concrete Bunker – separated from other material by approximately 5 metres

The largest area for stockpiling material at the Acorn site is the finished compost product located in the secondary processing area of the building. This material has been matured in the maturation bays and would not be considered microbially active enough to heat to a level that it would be a potential heat or ignition source. All other storage areas are less than 300 m^2 in area and piled to a height not exceeding 3.5 m and are mainly contained within physical fire barriers of fire breaks to limit any fire spread within the facility building.

7.2.1. Storage Time to Avoid Self Heating and Combustion

Section 5.1 of the Environment Agency Technical Guidance Note (TGN7.01) outlines the maximum storage time that green waste, wood chips or fines material should be stored for to reduce the potential for spontaneous combustion. The timeframes set in the guidance is outlined in Table I below.

Table I – Maximum Storage Time for Waste to Avoid Self Heating and Combustion

Guidance Document	Maximum Storage Time Period to Avoid Spontaneous Combustion
Section 5.1 of the Environment Agency Technical Guidance Note (TGN7.01)	**6 Months** - Green material, wood and wood products, general waste including RDF and fines

All compost material at the Acorn facility is stored internally pending shipment for use as a fertilizer. All material is rotated through the process on an on-going basis and as such there is no material on the Acorn site that would be stored in excess of 6 months.

7.3. Potential for Fire Spreading Posed by Other On-Site Buildings

The potential for fire spread posed by other buildings on site and fire spread posed from higher risk ancillary rooms within the facility (i.e., electrical room, plant room and fuel storage shed) was assessed based on the fire breaks in place at each of these areas. All ancillary rooms that have higher risk for fire are all of concrete construction which would have a fire rating of over 2 hours. The BMS and electrical room have a dedicated fire suppression system that would initiate long before that fire rating was reached, thus significantly reducing the potential for fire spread from those areas.

The fuel storage shed is also of concrete construction and is bunded to collect any released fuel or fire suppression agent. Because the shed is locked and only used by authorized personnel, and the fact that the site is manned 24 hours per day, six days per week, the potential for a fire to go undetected and spread from that shed to any other part of the facility is considered low.

7.4. Accurate Laminated Site Plan

A layout of the process building exists on the front of the entrance to the secondary processing area of the main building, see Plate 3. A new site layout plan has been recently erected on the front entrance.

Plate 3: Building Layout Plan

It is recommended that a site plan be developed outlining the building, main storage areas and potential high risk fire areas on the site. The site plan should also indicate where fire suppression equipment is located, utility cut of locations and site drainage layout.

7.5. Fire Escape

There are a number of escape routes within each area of the process building of the facility. Acorn have an escape route plan developed for each area of the building, see Drawing ARB-D01. All exits have signage posted above or beside the escape route to alert personnel and contractors / visitors of their closest fire escape and emergency lighting with battery backup, see Plate 4 below. Acorn also complete fire drills on a six month basis to ensure they meet ISO 18001 criteria. The emergency muster area is located on the south side of the facility yard beside the welfare buildings.

Plate 4: Fire Emergency Door at Acorn

Plate 5: Emergency Muster Area

The locations of escape doors for the process building are detailed on the Drawing ARB-D01 and are outlined in Table J.

Table J – Fire Escape Door Locations in Acorn Process Building

Building Area	Escape Door Location
Primary Processing	Main entrance/exit roller door and emergency exit pedestrian door at front of building
Primary Processing	Emergency pedestrian exit door on side (southeast) wall of building
Secondary Processing	Main entrance/exit roller door and emergency exit pedestrian door at front of building
Secondary Processing	Emergency pedestrian exit door on side (northwest) wall of building

A walkway is maintained to the front of the composting tunnels in the Primary Processing Area to ensure access to the escape doors at the southeast wall of the process building. The walkway extends to the west where a pedestrian emergency exit exits to the secondary processing area and then on to the pedestrian emergency exit door on the northwest wall of the Secondary Processing area. It was observed that the walkway was free of obstruction to allow unhindered egress from the facility if necessary.

8. FIRE RISK ASSESSMENT FOR ACORN RECYCLING

Based on the initial risk assessment completed in Section 2 of this document that only included the potential fire risk a revised risk assessment was completed to include the fire controls and preventative measures that are in place at
the Acorn site. The revised risk assessment scores are provided below.

Internal Facility Building - Primary Processing				
			FIRE RISK ASSESSMENT	
Risk Assessment Index No.: Acorn-01				
Area/Activity	**Risk**	**Risk Rating**	**Control Measures**	**Revised Risk Rating**
01A - Primary Process Area – Waste Reception Area	Overheating and possible ignition of feedstock may be a risk to personnel working in the Process Building	**L1 x S2=3 Low**	The site operates under ISO 18001 and have a number of controls to prevent and suppress any fire in the area. Fire Alarm and Detection System installed and maintained on site include: • High Output Electronic Sounders to give a minimum of 90db. • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • Fire Extinguishing Appliances are sited in the building and in all mobile vehicles for immediate suppression of fire upon detection. Extinguishers are inspected and tested in accordance with IS 291:2015. There is a service agreement in place with the installer to replace extinguishers/reels as required and to service all extinguishing appliances thoroughly each year. • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night.	**L1xS2=3 Low**
01B - Primary Process Area – Composting Tunnels	Overheating of material and self ignition in tunnels. may be a risk to personnel working in the Process Building	**L2 x S2 = 4 Medium**	• The core temperature of all process tunnels are constantly monitored and the air input adjusted accordingly. This mimimizes the potential for overheating of any pile and a self ignition situation from occurring. The moisture content of the process material is around 50% in the tunnels so the chance of the material catching fire is considered very low. • Fire Line detector located above the front of the composting tunnels and above the trommel screen is linked to internal fire alarm system and external text alert system; • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L1xS2=3 Low**

01C - Primary Process Area – Material Screening	Friction from belts or burnout of motors igniting fine dust material at screener may be a risk to personnel working in the Process Building	**L2 x S3=6 High**	• Fire Line detector located above the trommel screen is linked to internal fire alarm system and external text alert system; • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L2 x S2=4 Medium**
01D - Primary Process Area – Screened Plastics	Overheating of Material and self ignition on floor or in tunnel 1. may be a risk to personnel working in the Process Building	**L2 x S3=6 High**	• The temperature of the mixed organics/plastics material is moved from the floor to tunnel 1 as soon as possible. The temperature in tunnel is constantly monitored and the air input adjusted accordingly. This mimimizes the potential for overheating of pile and a self ignition situation from occurring. • Fire Line detector located above the front of the composting tunnels and above the trommel screen is linked to internal fire alarm system and external text alert system; • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L2 x S2=4 Medium**
01E - Primary Process Area – Screened Overs	Overheating of material and self ignition of pile. Friction from belts or burnout of motors igniting the material pile. may be a risk to personnel working in the Process Building	**L2 x S3=6 High**	• Material is constantly removed and blended into feedstock so overs material is not stockpiled for long periods at the screen. • Fire Line detector located above the trommel screen is linked to internal fire alarm system and external text alert system; • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L1 x S3=3 Low**

Internal Facility Building - Secondary Processing				
			FIRE RISK ASSESSMENT	
Risk Assessment Index No.: Acorn-02				
Area/Activity	**Risk**	**Risk Rating**	**Control Measures**	**Revised Risk Rating**
02A - Secondary Process Area – Maturation Tunnels **02B** - Secondary Process Area – ABP Tunnels	Overheating of Material and self ignition in tunnels. may be a risk to personnel working in the Process Building	**L2 x S2=4 Medium**	• The core temperature of all process tunnels are constantly monitored and the air input adjusted accordingly. This mimimizes the potential for overheating of any pile and a self ignition situation from occurring. The moisture content of the process material is around 50% in the tunnels so the chance of the material catching fire is considered very low. • Tunnel walls act as fire breaks to minimize any potential fire spread. • Fire Line detector located above the front of the maturation tunnels is linked to internal fire alarm system and external text alert system; • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L1xS2=3 Low**
C - Secondary Process Area Compost Storage Area	Overheating of material and self ignition of large compost pile	**L1 x S2 = 2 Low**	• Fire Line detector located secondary process area is linked to internal fire alarm system and external text alert system; • Material has been matured and would not be expected to heat to temperatures whereby self-ignition would occur. • Storage bay walls and distance from tunnels and other areas of the facility act as fire breaks to minimize any potential fire spread. • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and hose reels in the area for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015.	**L1 x S2 = 2 Low**

External Rooms Connected to Facility Building and External Areas				
			FIRE RISK ASSESSMENT	
Risk Assessment Index No.: Acorn-03				
Area/Activity	**Risk**	**Risk Rating**	**Control Measures**	**Revised Risk Rating**
03A - Site Office	Electrical fire due to overheating or power surge or malicious intent.	**L2 x S2=4 Medium**	• Smoke Detection System in offices connected to central fire alarm. • The Fire Detection and Alarm is connected to a 24hr Monitoring Centre which complies with IS228 & SR41 • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers in the office for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015. • Training has been provided to personnel on the correct operation of extinguishers.	**L1xS2=3 Low**
03B - Fuel Storage Shed	Cigarette discarded at shed or malicious ignition of fuel.	**L3 x S2 = 6 High**	• Fuel Shed is locked at all times when not in use and access is restricted. • Structure is bunded and is mainly a concrete and metal construction which will act as fire restrictor and reduce potential for spread of any fire. • Break glass alarm located adjacent on the main process building is linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers located on the external wall of the process building for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015. • Training has been provided to personnel on the correct operation of extinguishers.	**L2xS2=4 Medium**
03C - Electrical Control Room	Overheating of electrical panels or power surge burn out equipment and cause fire in	**L2 x S3 = 6 High**	• The Fire Detection and Alarm is connected to a 24hr Monitoring Centre which complies with IS228 & SR41 • Break glass alarm linked to central fire alarm system. • The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be	
03D - BMS Control Room		**L2 x S3 = 6 High**		

	control room.		immediate response to any fire incident in this area of the facility, day or night. • There is a dedicated fire suppression system in both the Electrical Room and BMS Control room that will extinguish any detected fire immediately. There are also fire extinguishers located on the wall outside each room. • Training has been provided to personnel on the correct operation of extinguishers.	

External Rooms Connected to Facility Building and External Areas				
			FIRE RISK ASSESSMENT	
Risk Assessment Index No.: Acorn-04				
Area/Activity	**Risk**	**Risk Rating**	**Control Measures**	**Revised Risk Rating**
04A – Welfare Facilities	Electrical fire due to overheating or power surge, malicious ignition or cooker fire in canteen.	**L2 x S2=4 Medium**	• The Fire Detection and Alarm is connected to a 24hr Monitoring Netwatch Centre • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area of the facility, day or night. • There are fire extinguishers and fire blankets in the canteen for fire suppression Fire Extinguishing appliances inspected and tested in accordance with IS 291:2015. • Training has been provided to personnel on the correct operation of extinguishers.	**L1xS2=2 Low**
04B - Wood Chip Biofilter	Hot pockets in wood chip in biofilter if proper air distribution not maintained. Burnout of motors or fans in air extraction system during dry weather conditions.	**L2 x S2=4 Medium**	• The air distribution to the biofilter is automatically controlled and monitored to ensure even distribution of air throughout the biofilter. • Air extraction fans and motors are located on concrete walls and are separated from the biofilter media • On-going checks and maintenance is completed on fans and motors to avoid burnout; • There are fire extinguishers and hose on the back wall of the process building for fire suppression. Fire Extinguishing appliances are inspected and tested in accordance with IS 291:2015.	**L1 x S1=2 Low**
04C - Fire Suppression Water Pump and Generator	Burnout of electrical wiring related to the pumps or backup generator.	**L2 x S1=2 Low**	• The isolated location of the pump and generator are such that any fore would be small and isolated to the fire suppression water lagoon area located approximately 30 metres from the main building. • The site is manned 24 hours per day, 6 days per week so there is a significant chance that there will be immediate response to any fire incident in this area day or night. • There are fire extinguishers on the external wall of the main process building for fire suppression if required	**L1 x S1=2 Low**

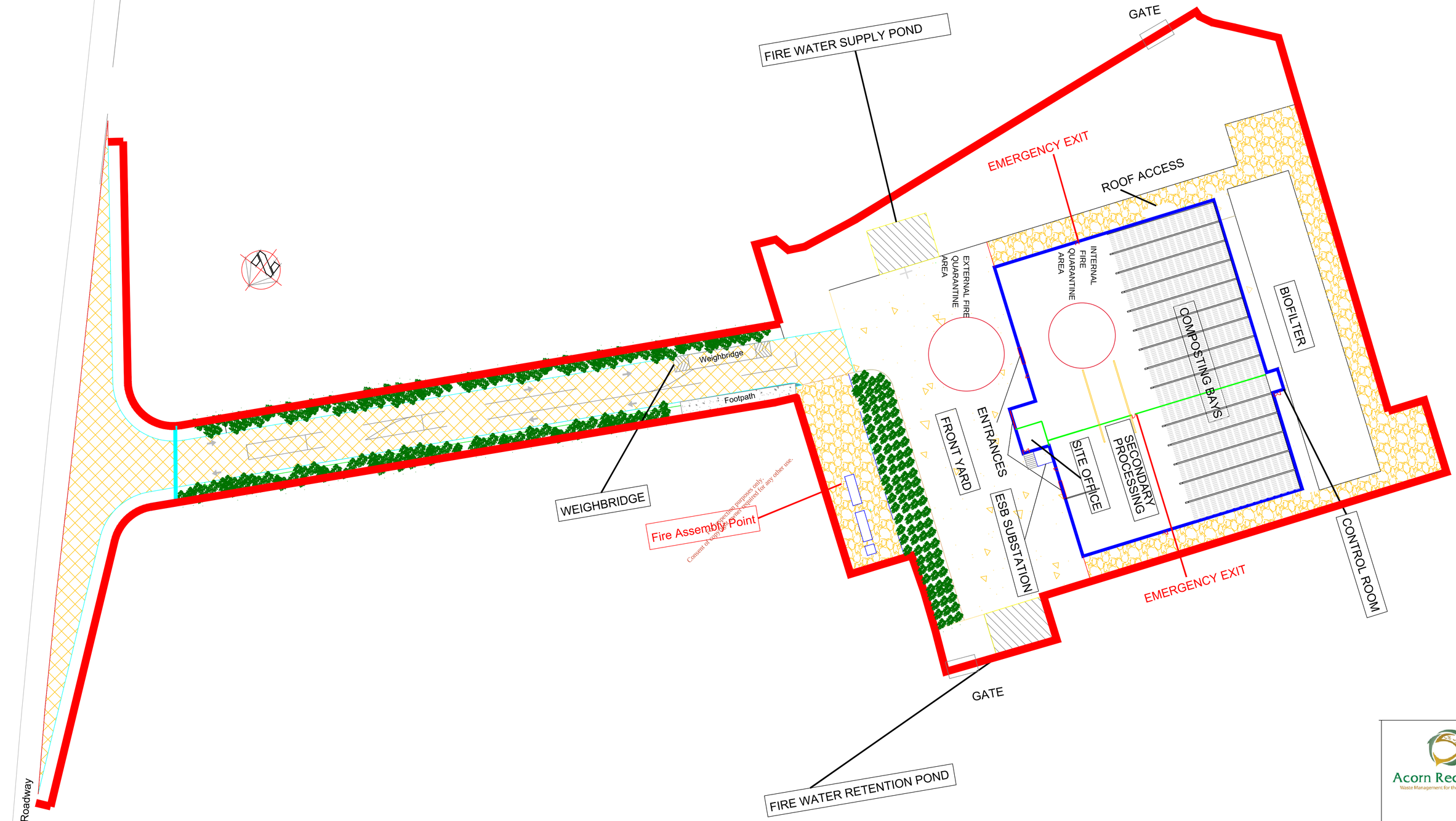
Site Activities that May Be High Fire Risk And Site Fire Controls in Place				
			FIRE RISK ASSESSMENT	
Risk Assessment Index No.: Acorn-05				
Area/Activity	**Risk**	**Risk Rating**	**Control Measures**	**Revised Risk Rating**
05A - Hot Works	Personnel working in the building	**S3xL2=6 High**	Before starting hot work, the operator/contractor must obtain a hot work permit from the site manager Before a hot work permit is issued, the issuer must inspect; • the area where the work will be carried out • the operator to ensure he is trained to use the equipment • the equipment to ensure it is in good working order • emergency procedures • fire equipment and necessary personal protection is available The operative / contractor carrying out the hot work must have a person to watch for fire. Following the completion of works a final inspection will be completed and permit signed and retained. The post hot work fire watch must be completed for a period of approximately 90 minutes.	**S3xL1=3 Low**

9. ACCESS AND FACILITIES ON SITE FOR FIRE SERVICES

The site has an emergency response procedure in place whereby in the event of a fire and the alarm is raised then the site manager and the fire services are notified immediately. The site is manned 24 hours per day 6 days per week so the site would be accessible to the fire service during normal operating hours. During the short times when the site would not be manned then the site manager would provide access to the site for the fire services. The presence of the fire water suppression lagoon provides access to a ready source of water for suppression and the front and sides of the main process building could easily be accessed by fire truck.

DRAWINGS

- **ARB D-04 – Site Services Plan**
- **ARB-D01 – Standby Capacity Drawing – Emergency Exit Routes**



99.90 Existing Level

xx.xxm Proposed Level

Extent of Asphalt Topping

Extent of Gravelled area

Extent of Footpath

Extent of Concrete Hardstanding

Notes.

All dimensions are in millimetres.

All levels are in metres.

This drawing is to read in conjunction with all other relevant drawings and specification.

The contractor shall inform the engineer of any discrepancies found in relevant documents.

Acorn Recycling
Waste Management for the next generation

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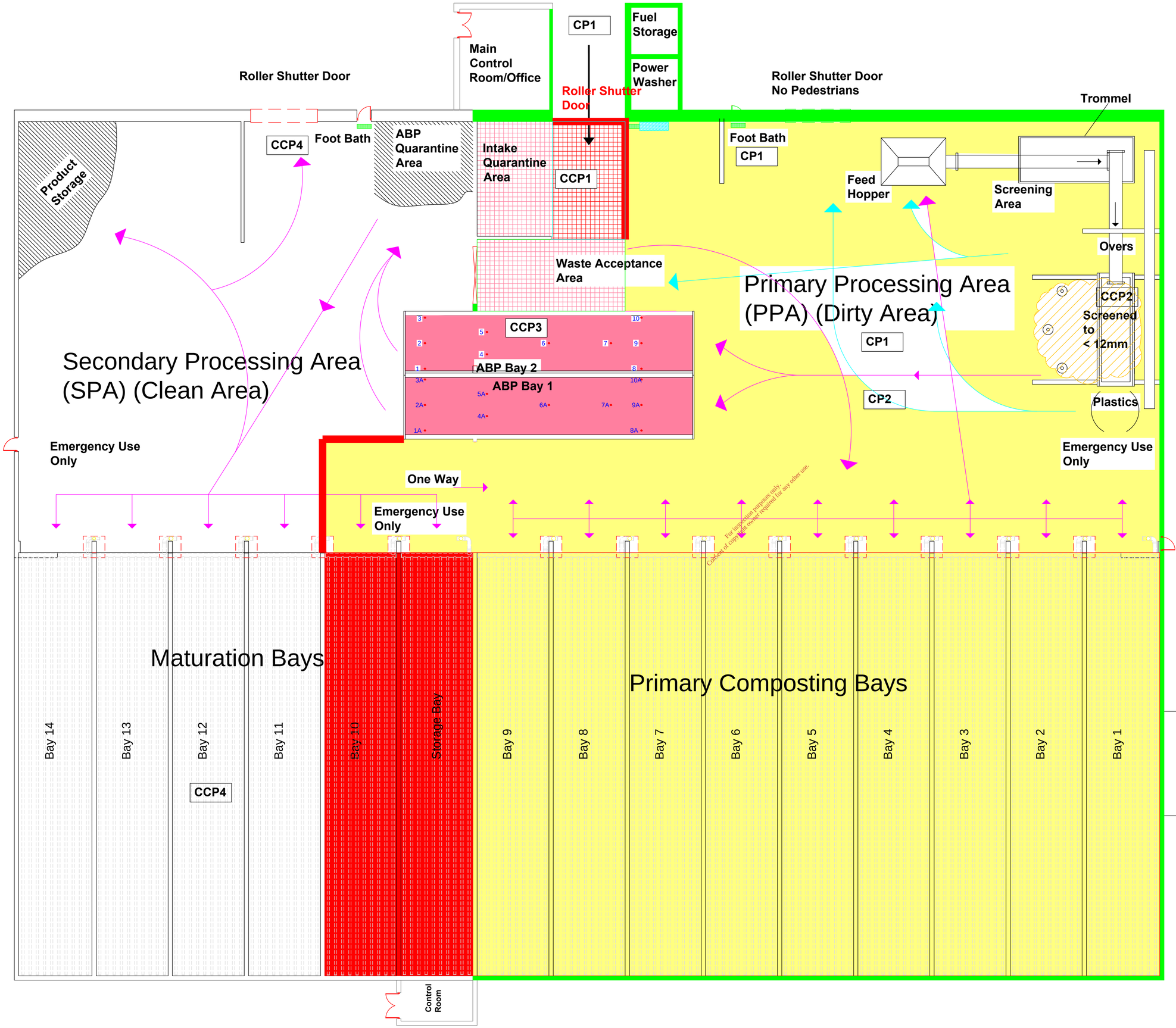
Project:
Ballybeg Composting Facility

Drawing Name:
Site Services Plan

Drawn By:	Scale:
GP	Not to Scale
Drawing Number: ARB D-04	Rev:



Critical Control Points

CCP1	Waste Acceptance
CCP2	Screening Before ABP Sanitisation
CCP3	Failure to Meet EU ABP Processing Standard
CCP4	Microbiological Sampling During Storage or Prior to Dispatch

Control Points

CP1	Dirty Area Operations
CP2	Loading and Unloading ABP Processing Bays
CP3	Product Put To Appropriate Use

NOTES:

All proposed changes marked in red

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Waste Management for the next generation

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Project:
Ballybeg Composting Facility

Drawing Name:
ABP Process Flow Diagram

Drawn By: GP	Scale: Not to Scale
Drawing Number: ARB-D01	Rev: A

Main Control Room

Foot Bath

Micro Sampling Area

Waste Acceptance Area

Foot Bath

Trommel

Feed Hopper

Screening Area

Overs

Product Storage

Emergency Exit Route

Emergency Exit Route

Proposed Fire Quarantine Area

Screened to < 12mm

Loader Turning Circle

R3580

ABP Bay B

ABP Bay A

Plastics

Plastics Storage

Emergency Exit

Overs/Wood Chip Storage

Emergency Exit

Emergency Exit Route

Emergency Exit Route

Maturation Bays

Primary Composting Bays

Plastics

Bay 14 | Bay 13 | Bay 12 | Bay 11 | Bay 10 | Bay 9B | Bay 9 | Bay 8 | Bay 7 | Bay 6 | Bay 5 | Bay 4 | Bay 3 | Bay 2 | Bay 1

Base to Access ladder

Control Room

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Waste Management for the next generation

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Project: Ballybeg Composting Facility

Drawing Name: Stand By Capacity Drawing

Drawn By: GP

Scale: Not to Scale

Drawing Number: ARB-D01

Rev:

ATTACHMENT 1

Hot Works Permit Example

Hot Works Permit

Acorn Recycling
Waste Management for the next generation

	Document Ref: HS ARB08 Hot Works Permit
Title: Permit to Work – Hot Work Permit	***Authorised By: Sam Bowden***
Acorn, Ballybeg	***Number of Pages: 1***

Date: .....

Location: .....

Contractor/Employee: .....

This permit is valid from: _____ am/pm On: .....

This permit is valid until: _____ am/pm On: .....

Description of works: _____

_____

Note: The following section of this permit must be completed and signed by the authorised person(s) before work is to proceed and only work listed above may be completed.

The following equipment will be used during the works (all equipment to be used is in good working order and is fit for use):

☐ Welder/soldering iron ☐ Angle grinder ☐ Saw

Other (please specify): .....

The following services have been shut off AND isolated for the duration of the works:

☐ Flip-flop screen/trommell & conveyors ☐ Flip-Flop Screen ☐ Fan

Other (please specify): .....

The following control measures have been implemented for the duration of the works:

☐ Area wetted down ☐ Area cleaned ☐ Water on standby

Other (please specify): .....

Authorisation

Permit Issued To:

..... _____ _____

(Print name) (Signature) (Date)

Permit Issued By:

..... _____ _____

(Print name) (Signature) (Date)

Cancellation/completion of permit

Permit cancelled/completed by:

....

(Print name) (Signature)

Cancelled/completed at: ..... am/pm On: .....

Reason for cancellation : .....

.....

Final Sign Off

The worksite has been inspected by me at following the cancellation/completion of the hot works and declared safe for normal operations to resume.

..... _____ _____

(Print name) (Signature) (Date)

ATTACHMENT 2

Site Cleanup Checklist Sheets

RS ARB23 MAN2 Scheduled Cleaning & Maintenance Week:

Day	Task Description	Done ✓	Signed/ Comments
Monday	Check 4 Rollers/wheels on trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Grease Screener & oil trommell feed conveyer chain		
	Check Fire Pump Generator & 3 No. fire hoses		
	Spray ACF-32 on fresh waste, overs and under screen		
	Checks on Leachate truck: oil, water, grease shaft. Blow out cyclones		
	Leachate 1-10 & aqua channel sumps.		
	Grease Screener & oil trommell feed conveyer chain		
Tuesday	Check 4 Rollers/wheels on screening trommell & clear material from above trommell motor. Wash bottom flip flop feed roller		
	Spray ACF-32 on fresh waste, overs and under screen		
	Check footbaths & Refill if required		
	GA2 inspection on loaders, grease loaders (shafts & auto greaser). Wash out under high tip rams. Wash Radiators		
	Check front pedestrian door is clear & clean		
	Leachate 1-10 & aqua channel sumps		
	Grease Screener		
Wednesday	Check 4 Rollers/wheels on screening trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Spray ACF-32 on fresh waste, overs and under screen		
	Check tracking on all belts		
	Grease Screener & oil trommell feed conveyer chain		
	Leachate 1-10 & aqua channel sumps. Blow out cyclones on truck		
Thursday	Check 4 Rollers/wheels on screening trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Clean walkways on screening plant		
	Check inside & outside of all emergency pedestrian doors are clean		
	Spray ACF-32 on fresh waste, overs and under screen		
	Leachate 1-10 & acco channel sumps		
	Clean out compost under Screen		
	Suck & wash interceptor, wash gullies & SW line		
	Grease Screener		
Friday	Check 4 Rollers/wheels on screening trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Grease Screener & oil tromell feed conveyer chain		
	Tidy power washer, diesel sheds, EMPTY all bins on site		
	Check inside & outside that all emergency pedestrian doors are clear & clean.		
	Wash out all ACCO Channels (clean and dirty side)		
	Spray (ACF-32) on fresh waste, overs and under screen		
	Leachate 1-10 & Aqua channel sumps. Blow out cyclones on Masko		
	Sweep yard with mechanical brush		
	Wash mats on flipflop		
Saturday	Check 4 Rollers/wheels on trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Leachate 1-10 & aqua channel sumps		
	Wash out radiator on L90E		

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	Leachate 1-10 & aqua channel sumps.		
	Grease Screener & oil trommell feed conveyer chain		
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	Check footbaths & Refill if required		
	GA2 inspection on loaders, grease loaders (shafts & auto greaser). Wash out under high tip rams. Wash Radiators		
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	Clean walkways on screening plant		
	Check inside & outside of all emergency pedestrian doors are clean		
	Spray ACF-32 on fresh waste, overs and under screen		
	Leachate 1-10 & acco channel sumps		
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	Grease Screener & oil tromell feed conveyer chain		
	Tidy power washer, diesel sheds, EMPTY all bins on site		
	Check inside & outside that all emergency pedestrian doors are clear & clean.		
	Wash out all ACCO Channels (clean and dirty side)		
	Spray (ACF-32) on fresh waste, overs and under screen		
	Leachate 1-10 & Aqua channel sumps. Blow out cyclones on Masko		
	Sweep yard with mechanical brush		
	Wash mats on flipflop		
Saturday	Check 4 Rollers/wheels on trommell & Clear material from above trommell motor. Wash bottom flip flop feed roller		
	Leachate 1-10 & aqua channel sumps		
	Wash out radiator on L90E		

ATTACHMENT 3

Fire Extinguisher Service Certificate

CERTIFICATE

This is to certify that the fire extinguishers at:

ACORN RECYCLING

BALLYBEG

THURLES Co. TIPPERARY

Have been inspected and satisfied the requirements of Irish Standard 291 : 2015

Date of Inspection: 26/7/16

Company Representative: MARTIN EVERARD

EVERARD FIRE

Ref.

Docket No. 2196 (Certificate invalid unless completed)

Signed Martin Everard (for and on behalf of Everard Fire Ltd)

Everard Fire Ltd., The Ragg, Thurles, Co. Tipperary. Tel: 0504 51369
Martin Everard Director 087 2624570
email: martineverard@eircom.net

APPENDIX 1

Fire Risk Assessment