COUNTRYCLEAN
RECYCLING LIMITED

Country Clean Recycling Ltd.,
The Mill Castletownroche, Co.Cork

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Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use,
EPA Headquarters,
P0 Box 3000,
Johnstown Castle Estate,
Co. Wexford
18-Oct-11

REF: W0257-01 - Country Clean Recycling Ltd

Re: Notice in accordance Article 14(2(b) (ii) of Waste Management (Licensing) Regulations

Dear Sir/Madam,

Please find enclosed an original and one hardcopy, plus 16 copies on CD-ROM digital format of information requested in accordance Article 14(2(b) (ii) of Waste Management (Licensing) Regulations in April 2011.

I trust this is satisfactory, if you require any additional information please do not hesitate to contact me.

Yours sincerely

Environmental Health Safety Officer
Country Clean Recycling Ltd

COUNTRYCLEAN
RECYCLING LIMITED

Article 12 & 13 Requirements

Waste License Application

Waste License WO257-01

October 2011

Head Office:
Country Clean Recycling Ltd
The Mill,
Castletownroche,
Co. Cork

Site Address:
Country Clean Recycling Ltd,
Churchfield Industrial Estate,
John F Connolly Rd,
Churchfield, Cork.

Foreword

The response takes the form of two sections;

- **Section 1** contains the requested Non-Technical Summary.
- **Section 2** contains each individual response to the additional information requested in accordance with Article 14(2)b(ii) to comply with articles 12 & 13 of the Waste Management (Licensing) Regulations.

Appendices

The additional information response in section 2 is supported with additional information which is contained in 10 attached appendices.

Section	Description	Relevance to Waste License Application Form
Appendix A	Waste facility permit reference 02/07	Attachment B.3
Appendix B	Hours of Operation	Attachment C.3 Hours of Operation
Appendix C	Amended Notice to the Relevant Planning Authority	Attachment B.3 – Appendix B.3.1
Appendix D	Odour abatement system	Attachment I.1 & Summary A1.8
Appendix E	Odour Modelling Report	Attachment I.1
Appendix F	Insurance Details & Bank Reference	Attachment L.2, Fit and Proper Person
Appendix G	Scaled maps all yard areas which will discharge storm	Attachment D.1 – Appendix D.1.3
Appendix H	Facility Operation	Attachment D.2
Appendix I	Complete Table H 1 (ii)	Table H 1 (ii) Waste Other Waste Recovery/Disposal
Appendix J	Table G.1	Table G.1

Drawings

These appendices include 3 maps/drawings in A3 size.

Strom Waste Discharge to Foul Sewer; 1094_01_08

Strom Waste Discharge to Foul Sewer (current); 1094_01_09

Process Layout; Drawing 10

1. Non-Technical Summary

Your reply to this notice should include a revised non-technical summary (Application Form and EIS) which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary.

The non-technical summary has been revised to reflect the information supplied in this Article 12 compliance.

A1.2. Quantity and Nature of the Waste

The facility is permitted to process non-hazardous material. The quantities and types of non-hazardous waste processed for 2010 are outlined in Table 1.

Table 1 Permitted Waste Types processed in 2010 under current Waste Management Permit

Cardboard packaging & paper packaging	15 01 01	1,084
Plastic packaging	15 01 02	0
Wooden packaging	15 01 03	0
Metallic packaging	15 01 04	0
Glass packaging	15 01 07	931
Other WEEE	16 02 14	0
Glass from End of Life Vehicles	16 01 20	27
Tyres	16 01 03	0
Lead batteries	16 06 01	3
Mixture of concrete, bricks, tiles and ceramics	17 01 07	1,600
Wood from construction and demolition waste	17 02 01	2,239
Glass from construction and demolition waste	17 02 02	161
Plastic from construction and demolition waste	17 02 03	8
Copper, brass, bronze from construction and demolition waste	17 04 01	0.2
Aluminium from construction and demolition waste	17 04 02	0.5
Lead	17 04 03	0
Zinc	17 04 04	0
Iron & Steel	17 04 05	0
Mixed metals from construction and demolition waste	17 04 07	840
Cables from construction and demolition waste not containing dangerous substances	17 04 11	3

Rubble Top Soil from C&D	17 05 04	1,750
Plasterboard gypsum-based construction materials	17 08 02	55
mixed construction and demolition wastes (Non-Hazardous)	17 09 04	0
Glass	19 12 05	0
Wood (Non-Hazardous)	19 12 07	
Mechanically Treated Waste	19 12 12	980
Paper & Cardboard	20 01 01	0
Glass	20 01 02	0
Biodegradable kitchen and canteen waste	20 01 08	57
Clothes	20 01 10	19
Textiles	20 01 11	0
Discarded electrical and electronic Equipment	20 01 35*	0
Discarded electrical and electronic Equipment	20 01 36	0
Wood (Non Hazardous)	20 01 38	0
Plastic from municipal sources	20 01 39	50
Metals	20 01 40	0
Biodegradable Waste	20 02 01	0
Soil & Stone	20 02 02	0
Mixed Residual Waste	20 03 01	28,470
Mixed Dry Recyclables	20 03 01	10,327
Bulky Waste	20 03 07	40

The facility currently accepts municipal waste arising in County Cork, Limerick, South Tipperary, Waterford, Kilkenny and Cork City from domestic and commercial sectors. The facility also provides it own collection service for the customers. Additional contracts taken on for the collection of wheelie bin household waste means that there will be a increase in Mixed Municipal Waste, Dry Recyclable, Glass and clothes from 2011 onwards It is proposed to increase the annual waste intake capacity to 100,000 the breakdown of which is shown in Table 2.

Table 2 Proposed Waste Types and Quantities

Household and Commercial Waste	**10,000**
Dry recyclable waste	**22,000**
Construction and Demolition Waste	**13,000**
Mixed Municipal Waste	**55,000**
Proposed Annual Permitted Waste Intake	**100,000**

*Please note that the quantities of the above waste types may not directly correspond to the maximum tonnes specified. Notwithstanding this the total amount of waste processed will be within the proposed permitted waste intake tonnage of 100,000 per annum.

A1.6 Operations

The facility proposes to operate seven days a week, 24 hours a day as follows:

05:00 to 21:00	24 hours

*The Normal hours during which the facility accepts waste. Waste consignments may need to be delivered outside these houses due to customer requests or waste collection vehicle break down during the day.

The following non-hazardous waste categories are accepted and processed at the facility for subsequent disposal and recovery.

- Mixed Municipal Waste
- Construction and Demolition Waste
- Source segregated waste (dry recyclables, plastic bottles and containers, tetrapak, cardboard, metal cans, Aluminum, packaging material.
- Wood
- Glass
- Cardboard
- Soil and Stone
- Bulky Waste
- Clothes
- Metals
- Plasterboard
- Garden Waste
- Kitchen and Canteen Food Waste

All inbound wastes are weighed on a weighbridge near the site entrance and the following information is noted:

- Waste Description including European Waste Code (EWC) code
- The origin of the waste
- The weight of the load.

The material is inspected prior to finally accepting the load. Any suspect loads are removed and stored in the quarantine area for further inspection and if non-compliant are returned to the customer.
As part of the process hazardous material e.g. batteries are indirectly received at the facility and separated for transfer to licensed recovery facilities.

Waste from Skip collection operations is tipped into the upper shed in the Material Recovery Facility and after initial sorting out of large bulky waste (i.e. mattress, pallets etc), the remainder of the waste is sent through on site waste processing system, that sorts the waste into various fractions which are sent onto waste licensed/permitted facilities for material recovery.
Waste from refuse trucks that collect wheelie bin waste from household and commercial premises i.e. residual municipal waste, dry recyclables, cardboard, glass (packaging), and clothes are tip into designated waste storage bays in the material recovery facility. This waste in either stored temporarily on site to be bulked transported to other waste facilities or this waste is treated/processed on site before being transported off site. Source segregated waste is baled and sent for recycling.
It is planned to process residual mixed municipal waste on site mainly by trommelling, shredding and ballistic separator to separate the organic fines from the residual waste. Timber is shredded on site and sent for recovery.

A1.8 Emissions and Treatment

Impact on Water

Activities at the facility will not have an impact on the area. Waste will be stored within the Material Recovery Facility, thereby minimising the likelihood of process lechate production at the site. Any accidental chemical spillage will be contained on site and treated immediately.

Foul Water

All waste handling and storage takes place on concrete hard standing areas. The processing of input materials, which comprise household and dry recyclable material, construction and demolition, and commercial waste, occurs within the main building. Although a dry recyclable facility, water present within crevices in the waste and water
tracked into the buildings on heavy machinery gives rise to effluent which is collected in a sump within the Materials Recovery Facility. The effluent from the sump is treated via a Class I full retention interceptor which separates the oil and solids from the water. The oil is separated through the application of coalescing devices to draw the oil droplets together to retain the oil safely until it is removed. The water subsequently discharges to Cork City Council (CCC) foul pipeline which runs through the northern section of the site. Sewage effluent from activities onsite discharges into Cork City foul sewer located to the south west of the site. All unroofed paved yard drainage also drains to the City Council foul sewer via the same inceptor. Drainage from the proposed wheel wash and onsite truck wash discharges to the foul sewer via the on site interceptor in compliance with Cork City Council planning permission T.P. 09/33682.
Country Clean Recycling has obtained an effluent discharge license from Cork City Council (WP(S) 629/10) for process effluent to the Cork City Council public sewer.

Emissions to Surface Water

Surface water runoff from the hard standings areas around the site (except the roof) is directed through a Class I Bypass Interceptor to reduce the oil and solids content before entering the foul sewer. In accordance with Cork City Council planning permission T.P. 09/33682, the drainage system will be altered so all drainage from unroofed yard drainage must be directed to the Storm sewer and at a quality suitable for such using suitable by pass interceptor/Slit Trap at a controlled flow rate conditioned by Cork City Council.

Impact on Air

There will not be any significant impacts to air quality as a result of operations at the facility. This is due to:

- Quick turn-around time for waste entering and leaving the facility.
- Prevention of point source emissions.
- The processing of waste material within buildings at the Material Recovery Facility.
- Exhaust emissions from vehicles entering and leaving the facility will have a minimal effect on ambient air quality.

The potential emissions to air from the operation of the facility are dust and odour.

Odour

The processing of mixed municipal waste and the acceptance of segregated organic waste has the potential to emit odours. All waste related activities of this waste fraction will be restricted to within main waste building and segregated organic waste is sorted in covered receptacle thereby mitigating potential nuisance from odour. In addition, biodegradable waste which may have the potential to cause odour nuisance is removed off-site within 48 hours of delivery.

The potential for odour emissions is minimised by; work practices such as quick waste turn around time, mitigation measures of having two rotary atomisers' waster misting odour suppression units in odour sensitive locations.

It is also proposed to implement a number of structural changes to further help deal with any potential odour nuisances;

- Interlock all doors, to reduce the possibility of a number of doors opened at the one time.
- Seal building fabric (e.g along apex eves, along concrete push wall, flashing on doors and at the top of doors).
- Reduce the opening on the doors that are opened/closed regularly through out the day by fitting with suitable curtains to reduce the surface area of the doors to 26m2.

Odour nuisances from the facility have not been observed in the past. Nor have any complaints relating to odour been received or lodged by the public. Through the continued good work practices and the implementation of infrastructural changes odour nuisance should not arise.

Noise Emissions

There may be noise emissions associated with the operation of this facility. The primary
sources of noise at the Waste Transfer Station are outlined as follows:

- Heavy goods vehicles (HGV's) delivering waste to and collecting waste from the site.
- HGV's tipping waste materials in the waste inspection area within the main waste
- building at the site.
- Operation of an excavator for handling waste/recyclables within the main waste building.

The noise emissions from the facility are mitigated by restricting the majority of wastehandling activities to the main waste building. The facility is located near John F. Connolly Road a distributor road which services the industrial estate and is subject to background noise levels associated with traffic, and operations from neighbouring sites.

The noise produced from CCR is broadband in nature and hence does not travel significant distances. The boundary noise measurements ranged from 42.3-69.0 LA90
daytime (15min) to and LA90 34.1-41.9 nighttime. The report noted that onsite monitoring locations were influenced by activities occurring in the nearby industrial estate and traffic passing on the road.

Two Noise Sensitive Locations (NSL) located in agricultural lands to the north and east of the site were monitored. Results were noted to be in compliance with the Environmental Protection Agency limits of 45 dB(A) LAeq during the night- time, and 55 dB(A) LAeq at during the daytime.

A.9 Impact of Emissions

As a result of the nature of the waste streams accepted on the site and with the implementation of efficient site operating procedures, and enclosure of the Timber Shredding unit, it is unlikely that there will be any significant impacts on air quality due to dust or odour as a result of operations at the facility.

It is not expected that storm water discharged to the surface water sewer will have an impact on the environment. Stormwater will be conveyed to an attenuation tank and discharged to the public storm sewer. Runoff from the site will be discharged at a controlled rate.

Foul sewage and paved area runoff will be collected and discharged to the public system. The foul water will be treated by Cork City Council.

Noise emissions may arise from the operational plant at the facility as well as traffic to and from the site. However, compaction operations will be housed to minimise noise emissions and traffic movements will be limited to normal opening hours and so operations at the facility will not be expected to have a significant impact on existing background noise levels.

There will be no discharges to ground or groundwater, therefore the facility is not expected to impact the ground water.

Provision of Information related to Section 40(4) of the Waste Management Act Compliance with Emission Standards Best Available Technology (BAT)

Country Clean Recycling Ltd will employ site practices and best available technology in accordance with BAT principles to avoid any environmental pollution and prevent and mitigate any nuisance emissions from the facility.

2. Further Information

1. Provide a copy of the existing Waste Facility Permit for the facility (referred to as 02/07 in the licence application).

Please find attached in Appendix A a copy of the waste facility permit reference 02/07 issued by Cork City Council. That should have been in enclosed within attachment B.3 of the original application.

2. Clarify if the proposed hours of operation are from 0700 to 1900 (Monday to Sunday). (The waste licence application and associated EIS refer to hours of operation as 0700 - 0700 (Monday to Sunday)).

Country Clean Recycling Ltd wishes to operate on a 24 hour basis. At present all sorting and waste processing operations normally take place between the hours of 5am to 8pm. But as the site is manned 24 hours a day some light sorting of waste and cleaning takes place outside of these hours. Country Clean Recycling Ltd intent to operate and process waste on a 24 hour basis as it has done so in the past. This is in line with other waste licensed facilities throughout the country which were granted permission to handle, accept and operate on a 24 hour basis. Furthermore to CCR's past experience we need the facility is manned 24 hours a day to accept waste from refuse trucks that might have broken down during the day. Under waste collection permits regulations refuse trucks containing waste cannot be parked overnight in a location that does not have a waste license or waste permit. Therefore to comply with our waste collection permits we need to have access to a licensed or permitted waste facility with non restrictive hour of opening to deliver waste to at any hour. Additionally Country Clean Recycling need to have the site available 24 hours as clients sometimes require CCR to have supply them with skips on a night-time basis due to Local Authority requirements i.e. road maintenance that is only allow that require road closures may only be permitted to take place at night by Cork City Council, to negate daytime traffic congestion.
The different proposed hours of operation are reflected in the submitted Non-Technical Summary and an amended Attachment C.3 is contained in Appendix B.

3. Provide a revised copy of written notice of the licence application to the relevant planning authority. The notice should include the information specified in Article 6 of the Waste Management (Licensing) Regulations 2004-2008.

Appendix C contains the relevant revised copy of written notice of the licence application to the relevant planning authority. This was sent to Cork City Council's Planning Directorate in June 2011 containing all information as required in Article 6 of the said regulations.

4. Describe the methods, processes and operating procedures for handling and processing of municipal waste and pre-treated municipal waste accepted at the facility.

At present(October 2011) municipal waste received on site from refuse wheelie bin collections or skip collections that may be described municipal solid waste (MSW) is stored on site in a dedicated waste storage bay within the Material Recovery

Building. All such MSW waste for disposal is stored overnight at the facility and is removed from the facility within 24 hours of its arrival on site.
Any waste sent to landfill will comply with EPA waste guidance document Municipal Solid Waste - Pre-treatment & Residuals Management.
Details of proposals to treat mixed municipal waste are contained in Attachment D.2 see figure D.2.1d (in appendix H). The proposed treatments mechanically removing the organic fines fraction of the waste as well as removing ferrous, non ferrous metals and plastics.

5. Provide details of the number of air changes proposed for the Materials Recovery Building.

Country Clean Recycling Ltd had an EIS carried out in January 2009, a dust monitoring report in April 2010 and an odour dispersion modelling assessment in September/October 2011 none of these reports recommended any form air extraction system/odour abatement system to be implemented on site. Therefore no air changes are proposed for the Material Recovery Building.

6. Provide details of the odour abatement system currently in place within the Material Recovery Building.

Two rotary atomisers (supplied by PCP Group) waster misting unit are positioned in the upper shed were the MSW and compost waste is stored. These units include a feed pump that allow odour suppression chemicals to be mixed with the water (at the required dilution) to suppress fugitive odours that may emanate from stored MSW and compost waste. Details and specifications of these rotary atomisers from the PCP Group are contained in Appendix D.

7. Provide information in relation to all the vents/extraction points to atmosphere from the existing and proposed Materials Recovery Building.

There is one vent from an exhaust outlet from the trommel diesel engine machine situated in the lower shed; this vent is located on the roof of the lower shed.

As the facility stands there are no vent or extraction points to the atmosphere from any air extraction treatment technology within any of the buildings on site.
Country Clean Recycling Ltd had an EIS carried out in January 2009, a dust monitoring report in April 2010 and an odour dispersion modelling assessment in September/October 2011 none of these reports recommended any form air extraction system/odour abatement system to be implemented on site. Therefore there are no vents/extraction points are proposed or envisaged from any air extraction and treatment technology.

8. Provide an odour dispersion modeling assessment for the emission from the activity based on the acceptance and handling of the maximum quantity of biodegradable/odorous wastes, as specified in the licence application. The information submitted should include:
(i) A printout of the input files and output data for the odour dispersion model.
(ii) Electronic copies of the input and output files and a copy of the meteorological data used should also be submitted on CD.

(iii) Details of the predicted impact at nearby odour sensitive receptors.
(iv) Proposed recommendations to minimise odour emissions, where applicable.

An odour modelling assessment was carried out by *Odour Monitoring Ireland* between June to October 2011, the completed report with recommendations is attached in appendix E, electronic copies of the input data is included with the attached report, and within the electronic copies of this response.

9. In relation to Section L.2, Fit and Proper Person, of the licence application, provide information to show that the person is likely to be in a position to meet any financial commitments or liabilities that may have been or will be entered into or incurred in carrying on the activity to which the application relates or in consequence of ceasing to carry out the activity.

Appendix F includes details of applicant's current insurance cover along with a reference letter from Country Clean Recycling Ltd Bank as evidence that the applicant will be in a position to meet any financial commitments or liabilities.

10. Identify on a suitably scaled map all yard areas which will discharge storm water to the foul sewer system.

Appendix G contains two scaled map. One of all yard areas which discharge storm water to the foul sewer system, at present (September 2011); Map Ref *1094_01_09 Strom Waste Discharge to Foul Sewer (current).*
The second map details yard areas which discharge storm water to the foul sewer system as per the conditions of Country Clean Recycling Ltd latest planning permission TP 09/33682; Map Ref *1094_01_08 Strom Waste Discharge to Foul Sewer.*

11. Provide details in relation to the noise abatement measures for the Materials Recovery Building and for on-site wood shredding.

The noise survey carried out for Country Clean Recycling's Waste License application which was included in Attachment E.5 (Noise Emissions) of the original application concluded in relation to noise sensitive location (NSL) results were in compliance with the Environmental Protection Agency Limit of 45 dB (A) LAeq during the night-time and 55 dB(A) LAeq during the daytime. However Country Clean Recycling Ltd is willing to explore and undertake a number of possible noise abatement measures in agreement with the Agency where it has been revealed that noise level are at an unauthorised level. Such measure will be undertaken with reference to the EPA's "Guidance Note for in Relation to Scheduled Activities" (2nd ed.). Possible details of abatement measures include;

- Undertaking noisy activities indoors (including wood shredding), where practicable, or in areas of the site that are remote from NSLs;
- Using acoustic enclosures / screens around plant or equipment or near noise sensitive locations. Such enclosure could include strategically placed wooden walls to buffers noise from the wood shredder.

- Minimise the operation of significant noise generating equipment or plant at night.
- Continue to implementing a regular maintenance programme for waste handling and processing plant and equipment;
- Ensure, where practicable, that enclosures or doors in the Material Recovery Buildings are properly sealed or closed when noisy waste handling and processing equipment or plant is operating inside the enclosure or building.

12. Provide a copy of attachment D.2 - Facility Operation.

Appendix H contains Facility Operations Details, including a scaled map of process operation locations. This section includes details of handling of municipal waste.

13. Complete Table H 1 (ii) Waste Other Waste Recovery/Disposal to include information in relation to all wastes currently and proposed to be sent off-site for disposal or recovery, including the recovery and disposal method, location and undertaker, where applicable. Include mixed/mechanically treated municipal waste and any additional commercial wastes, where applicable.

Completed amended table H1 (ii) is contained in Appendix I

14. Complete Table G.1 of waste licence application form to include Risk and Safety Phrases, where applicable.

Amended table G.1 is contained in Appendix J

Your reply to this notice should include a revised non-technical summary (Application Form and EIS) which reflects the information you supply in compliance with the notice, insofar as that information impinges on the non-technical summary.
In the case where any drawings already submitted are subject to revision consequent on this request, a revised drawing should be prepared in each case. It is not sufficient to annotate the original drawing with a textual correction. Where such revised drawings are submitted, provide a list of drawing titles, drawing numbers and revision status, which correlates the revised drawings with the superseded versions.

-END-

Appendix A

Comhairle Cathrach Chorcaí Cork City Council

Environment Department
1st Floor,
12 Mary Street,
Cork.

Fón/Telephone: 021 4924000
Faics/Facsimile: 021 4924054
Líonra/Website: www.corkcity.ie
R-phost/E-mail: environment@corkcity.ie

Ref:

Country Clean Recycling Ltd.,
Churchfield Industrial Estate
John F. Connolly Road,
Cork

September 25, 2007.

Re: Permit

DearSir/Madam

I enclose herewith permit, No: 02/07, Register No 902, under Waste Management (Permit) Regulations 1998 for the period to 30th June 2010. Please keep this reference number for your records.

Apologies for any inconvenience caused.

Yours sincerely

Jeremiah T. Moynihan,
Administrative Officer
Environment.

Waste Management Act, 1996
Protection of the Environment Act 2003
Waste Management (Permit) Regulations 1998. S.I. No. 165 of 1998

Register No. 902 . **Date 19/07/2007**
Permit No. 02/07.

A Permit, under the Waste Management (Permit) Regulations 1998 S.I. No. 165 of 1998, is hereby granted by Cork City Council, to Country Clean Recycling Ltd., to carry on waste recovery activities under paragraph 5 of Part I of the First Schedule of the Regulations of 1998, paragraph 13 of the Third Schedule of the Waste Management Act, 1996 and Protection of the environment Act 2003, and paragraphs 2, 3, 4, & 13 of the Fourth Schedule of the Waste Management Act, 1996 and Protection of the Environment Act 2003, from 1st July 2007 to 30th June 2010, at Churchfield Industrial Estate, John F Connolly Road, Cork, in accordance with the Application and plans received on 1st August 2000, further information received on 23rd January 2001, 5th April 2001, 12th April 2001, 18th December 2001, and 4th July 2003, and Map 15th September 2003 and in accordance with the following conditions:

Conditions

1. Materials Management

1.1 Only wastes described in the application and included in the following: mixed municipal waste, glass, paper, cardboard, metal, plastic, rubble, topsoil, rubble, wood, hedging & garden type, textiles, may be managed at the facility on the site.

1.2 Materials other than those for which a permit has been granted shall be removed from the site to an approved facility.

1.3 Recovered waste streams such as cardboard, plastic, and wood, shall be sent to approved recycling companies only.

1.4 Residual waste, following recovery, shall be sent to approved facilities only. Waste, including residual waste or mixed dry recyclables, intended for export from the state for recovery must be shipped under transfrontier shipment procedures of Council Regulation (EEC) No. 259/93, and may not be exported from the state for direct landfilling.

2. Water Quality and Groundwater Protection

2.1 There shall be no discharges to sewer, other than domestic type discharge for the use of operators of the facility, to the public foul sewer, and surface water runoff to the public surface water sewer.

2.2 Measures shall be put in place to ensure that surface water discharges from the site are free from all contaminants, and particularly contaminants such as oil, diesel, brake fluid. If it is anticipated that surface water from the site may contain contaminants, or if the operation of the facility proves this to be the case, then an oil interceptor trap shall be placed and maintained, in the surface water system for the site, to ensure that contaminants do not enter the public surface water drainage network, or any watercourse. The interceptor shall be cleaned regularly and waste from it shall be disposed of at an approved facility.

2.3 It shall be ensured that contamination of groundwater e.g. by oil and diesel, is not caused by the operation of the facility.

2.4 It shall be ensured that discharges of List1 and List 11 substances of Directive 76/464/EEC to surface water or groundwater are prevented.

2.5 A solid impermeable surface shall be maintained under the operational portion of the facility. All damaged or cracked surfaces shall be repaired immediately. It shall be ensured that the structure of the existing pit is sound and impermeable. If the pit shown to be permeable, or if there are grounds for suspecting it is impermeable, steps shall be taken immediately to ensure it's impermeability.

3. Emissions to Atmosphere

There shall be no emissions to atmosphere. In addition there shall be no dust or odours of significant environmental level, or nuisance, caused by the operation of the facility beyond the site boundary. There shall be no burning of any materials at the facility.

4. Noise

4.1 Noise from activities on the site shall not give rise to noise levels off the site exceeding 55dB(A) Leq, 15 minutes during the hours of 0800 - 2200 and 45 dB(A), Leq 15 minutes during the hours 2200 – 0800. There shall be no audible tonal or impulsive noise.

4.2 In the event that the levels of 4.1 levels are exceeded, and noise nuisance is caused to other receptors off site, corrective measures shall be put in place to ensure compliance.

5. Hazardous Waste

5.1 Hazardous waste shall not be accepted at the facility.

5.2 Procedures shall be put in place for dealing with any hazardous wastes, e.g. asbestos, paint tins, waste oil, pesticides, batteries, which might be inadvertently brought onto the site. Such procedures shall include segregation form other waste, safe handling and storage of these wastes and their subsequent removal to an approved facility under C1 procedures by a licensed carrier. Staff training in these procedures shall be put in place. The storage areas for each hazardous waste type shall be clearly labelled. Attention is drawn to the further information received on 5th April 2001.

6. Fuel Storage

6.1 There shall be no storage on the site of petrol, or any Class I, or Class II fuels.

6.2 Secure and safe structures, tanks, plant and equipment shall be installed for the storage and dispensing of diesel fuel. Diesel fuel shall not be stored in an enclosed space. Diesel storage shall be either:

(a) Approved type external fuel storage tank/tanks which shall be bunded. Bunding volume shall be at least 110% of the volume of the storage tanks. Storage tanks and bunding shall be impervious to the fuel being stored, and drainage plugs and valves must be kept closed at all times, except when draining down of surface water, if this is found to be necessary. All fuel storage tanks shall be clearly labelled.

Or

(b) Approved type double skinned buried storage tank/tanks. The tanks shall be fitted with an alarm to detect leaks. Tanks shall be fitted with breather pipes.

7. Litter and Flytipping

7.1 Measures shall be taken to ensure that the operation of the facility does not give rise to dirt or litter on the public road, footpaths or open spaces. Such dirt or litter shall be removed immediately. Responsibility for removal shall rest with the Permit holder.

7.2 Measures shall be taken to prevent flytipping. Flytipped waste shall be removed immediately to an approved facility. Responsibility for removal shall rest with the Permit holder.

7.3 The site shall be kept clean, neat and tidy.

8. Notification and Record Keeping

8.1 Records shall be kept of all materials entering and leaving the facility.

A record shall be kept of each load entering the site including (a) name of carrier (b) registration no. of vehicle (c) type of waste (d) quantity of waste.

A record shall be submitted to Cork City Council by 31st January of all waste managed in the previous year. The record shall show the total quantities in tonnes of each waste type, EWC code, name of site accepting waste for recycling, recovery, disposal. A record shall also be kept of other waste e.g. domestic type, hazardous waste. The format of 'Table 4' in the permit application shall be used when submitting waste information.

8.2 Records shall be kept of all complaints relating to the facility. Records of complaints shall include (a) date and time of complaint (b) name and address of complainant (c) details of complaint (d) action taken on foot of complaint (e) details of response to complainant.

8.3 Records shall be kept of all environmental incidents. Records shall include (a) date and time (b) list of contaminants (c) areas affected by incident (d) action taken (e) reports by environmental consultants and Cork City Council.

8.4 Cork City Council shall be notified of environmental incidents, immediately upon their occurrence.

8.5 Records shall be kept of all correspondence with Cork City Council and other statutory bodies e.g. EPA, HSA.

9. Contingency Plans

9.1 Fire fighting procedures shall be put in place. All staff shall be trained in basic fire prevention and fire fighting. Adequate fire fighting equipment shall be maintained on the site. In the event of a fire, which cannot be brought under control, occurring at the facility, the Fire Brigade shall be notified.

9.2 In the event of an environmental incident i.e. where pollution to air, water, soil, plants, animals, or persons is caused by the operation of the facility, the following procedure shall apply:

Measures shall be taken be prevent further pollution e.g. sealing of gullies and drains; Cork City Council shall be informed immediately; outside normal working hours the Fire Brigade shall be informed; measures shall be taken, in consultation with Cork City Council, to clean up the pollution caused; measures shall be put in place to prevent a reoccurrence of the incident.

10. Facility Management

10.1 The site to which this permit relates is at Churchfield Industrial Estate, John F Connolly Road, Cork, and is as shown on the four drawings prepared by Wood Environmental Management Ltd, and one drawing prepared by Raymond Barrett Associates, submitted as part the application. The drawings are:
(1) Map 1 - Site Location Map. Site outlined in red
(2) Map 2/Figure 2 – Map Showing Ownership of Adjoining Land and Location of Site Notice.
(3) Map 3 – Site Layout (Prepared by Raymond Barrett Associates).
(4) Map 4 – Cork Mini Skips Site Layout.
(5) Map 5/Figure 5 – Map showing Proposed Site Monitoring.
(6) Site Location – Churchfield Permit Extension, dated 15/09/03 prepared by Nigel Barnes & Associates, Consulting Engineers.

Note: The site for which this permit is granted is as outlined in blue in "Site Location – Churchfield Permit Extension," dated 15/09/03 prepared by Nigel Barnes & Associates, Consulting Engineers.

10.2 It is the responsibility of the permit holder to ensure that all the requirements, including procedures and measures, of this permit are adhered to.

10.3 The permit holder shall submit an annual report to Cork City Council by 31st January, relating to the activities of the previous year. The report shall comprise of
(a) a report on all environmental incidents
(b) a summary of all complaints
(c) details of the materials managed at the facility as outlined in paragraph No 8 above

10.4 A copy of this permit shall be kept on the site at all times, and shall be made available for inspection by authorised personnel at all reasonable times.

10.5 A notice board shall be erected and maintained at the entrance to the site, outlining the activities of the facility, the working hours, and contact persons with telephone numbers, for emergency purposes as well as for other queries.

10.6 In the event of any material change in the facility, or the operation of the facility, Cork City Council shall be informed immediately. Cork City Council shall be informed of any changes to the information submitted in the application of 1st August 2000 and subsequent information submitted on 23 rd January 2001, 5th April 2001, 12th April 2001 and 18th December 2001.

10.7 The site shall be maintained in a visually presentable condition at all times. Structures, including boundary walls and fences, shall be maintained securely. Finishes to structures shall be kept clean and shall be touched up as necessary.

10.8 Security at the site shall be maintained at all times to prevent break in and subsequent damage or theft.

10.9 Scavenging at the site is prohibited.

10.10 Measures shall be put in place to prevent and control vermin at the site. Refer to the information submitted in paragraph 12 of the application form.

10.11 Procedures shall be put in place to ensure that a person is available at all reasonable times to meet an Authorised Officer of Cork City Council at the site. Full access to the facility shall be granted at reasonable times, to authorised personnel.

10.12 Procedures shall be put in place to ensure that information regarding the operation of the facility is made available to the public.

11. General Responsibilities

11.1 The granting of this permit does not exempt the permit holder, the site owner, this development, any other development, from compliance with other legislation, and in particular with planning legislation.

11.2 The permit holder is legally responsible for all aspects of the operation and maintenance of the facility. Nothing in this permit reduces the legal liabilities of the permit holder, and of the site owner.

11.3 The permit holder shall be responsible for all necessary rectification of damages, including environmental damages, arising out of the operation of the facility.

11.4 The permit holder shall immediately inform Cork City Council of the issue by a court on any order in respect of the site under Sections 57 or 58 of the Waste Management Act 1996 or Section 35 of the Protection of the Environment Act 2003. The permit holder shall immediately inform Cork City Council of any conviction of the holder for an offence prescribed under section 34(5) or 40(7) of the Waste Management Act 1996 or Section 48 or 49 of the Protection of the Environment Act 2003.

12. Contributions

12.1 The permit holder shall pay to Cork City Council such annual contributions towards the cost of monitoring the operation of the facility, as Cork City Council considers necessary for the performance of it's duties under this Act as follows:

(a) Not later than 30th August 2007, the permit holder shall pay to Cork City Council, a contribution of €500.

(b) In subsequent years, the permit holder shall pay to Cork City Council an annual amount of not less than €500 updated in accordance with the Consumer Price Index from the date of the grant of this permit to the value pertaining at the time of payment of each annual contribution. This amount shall be paid before 30th August each year.

(c)Notwithstanding the foregoing, the rate of contribution each year shall take account of the actual costs of monitoring as incurred by Cork City Council in the previous year and as estimated for the next year.

Appendix B

C.3 Hours of Operation

Attachment C 3 should contain details of hours of operation for the waste facility, civic waste facilities and other facilities.

(a) Proposed hours of operation.
(b) Proposed hours of waste acceptance/handling.
(c) Proposed hours of any construction and development works at the facility and timeframes (required for landfill facilities).
(d) Any other relevant hours of operation expected.

The proposed hours of operation are outlined below:

(a) The Facility will operate 24 hours per day Monday to Sunday inclusive.

(b) The facility will accept waste from 05:00 to 21:00 Monday to Sunday inclusive

(c) Not applicable

(d) Collection/deliveries may be required outside normal operational hours to facilitate customer demand waste collection vehicle break down during the day. These abnormal hours will be recorded.

Appendix C

Country Clean Recycling Ltd.,
The Mill Castletownriche, Co.Cork

Tel: 022 46848
Fax: 022 46956
Email: sales@countryclean.ie
Web: www.countryclean.ie

COUNTRYCLEAN
RECYCLING LIMITED

Head of Planning,
Planning and Development Directorate,
Cork City Council,
Anglesea Street,
City Hall
Cork

15th June 2011

Re: Amended Notice to the Relevant Planning Authority-Waste Licence Application for Country Clean Recycling Ltd.

Dear Sir /Madam,

In accordance with Article 9 of the Waste Management (licensing) Regulations 2004 - 2008, Country Clean Recycling Ltd, notified Cork City Council in December 2007 (copy of original letter attached) of its intention to apply for a waste license with the Environmental Protection Agency (EPA) . Due to a correspondence received from the EPA (11.April.2011) Country Clean Recycling Ltd wish to update this written notice to include all the information specified in Article 6 as required by Article 9 of the said regulations. This update is as follows;
Country Clean Recycling Ltd, of Churchfield Industrial Estate, John F Connolly Road, Cork wishes to gives notice that in February 2009 it made make an application to the EPA for a Waste Licence in respect to extending their existing Material Recovery Facility located in Churchfield Industrial Estate, John F. Connolly Rd, Churchfield, Cork- National Grid Reference as follows: E566068, N573642.

Country Clean Recycling Ltd. propose to extend their existing facility which currently operates under a Waste Permit from Cork City Council and increase the annual intake to 100,000 tonnes per annum of non-hazardous waste.
The Classes of Waste Disposal and Recovery Activities applied for as per the Third and Fourth Schedules of the Waste Management Act, 1996 to 2003 are as follows:

Third Schedule

Class 11 -Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
Class 12 - Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
Class 13- Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Fourth Schedule

Class 2- Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes).
Class 3- Recycling or reclamation of metals and metal compounds.
Class 4- Recycling or reclamation of other inorganic materials
Class 11- Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
Class 12 - Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.
Class 13- Storage of waste intended for submission to any activity referred to in a preceding

COUNTRYCLEAN
RECYCLING LIMITED

Country Clean Recycling Ltd.,
The Mill Castletownriche, Co.Cork

Tel: 022 46848
Fax: 022 46956
Email: sales@countryclean.ie
Web: www.countryclean.ie

paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

The Principal activity at the site is Class 4 of the Fourth Schedule as detailed above.

The application is accompanied by an Environmental Impact Statement (EIS).
A copy of the Waste Licence Application and EIS and such further information relation to the application as may be furnished to the Agency in the course of the Agency's consideration of the application will, as soon as is practicable is available for inspection and purchase, at the Headquarters of the Environmental Protection Agency, Johnstown Castle Estate, Wexford.

Please note that the EPA has not made any decision on this application to date, waste license reference WO257-01.

Trusting this is to your satisfaction. If you have any further queries in relation to this matter please do not hesitate to contact me.

Yours Sincerely,

Flor Crowley

Environmental Health & Safety Officer

Country Clean Recycling Ltd

C.C. Stuart Huskisson, Environmental Licensing Programme Office, Office of Climate, Licensing & Resource Use, Environmental Protection Agency, Headquarters, PO BOX 3000, Johnstown Castle Estate, Co. Wexford.

Appendix D

ROTARY ATOMISER

Technical Information Sheet – Rotary Atomiser

Description

The Miniat Atomiser device uses a rotating metal gauze cylinder to create droplets of uniformed size (monodispersed).
The Atomiser works by injecting water into the cylinder head spinning at 12,000 rpm, dividing the liquid into an incredible 238 billion droplets per litre.
Independent Research on the Miniat has shown that the droplets created by the Miniat Atomiser combine most effectively with odour molecules and dust particles in the atmosphere.

Main Advantages

The pattern and droplets formed by the Miniat Atomiser result in a dramatic increase in efficiency for all spraying methods, creating the perfect droplet size, thereby reducing wasted liquid as is produced by conventional nozzle systems.
Large droplets waste water because they do not adhere to particulates in the air and fall to the ground too early. On the other hand droplets too fine can drift away from the target area and evaporate too quickly. The ideal is a consistent spray pattern, with uniform droplet size. The Miniat Atomiser comes with a flow meter as standard, which allows a variable flow rate of liquid into the cylinder head. The flow rates can be regulated from 1 litre an hour up to 180 litres an hour, easily and quickly.

Maintenance problems eliminated

The Miniat Atomiser has overwhelming advantages compared to conventional nozzle systems, which tend to become blocked and deformed with use. Conventional nozzles have to be replaced, regularly maintained (filter changes etc) and of course do not allow a variable flow rate.

The Miniat Rotary Atomiser

- Never blocks - no need for filters
- Uses less water than nozzle systems
- Needs little or no maintenance
- Greater coverage
- Portable
- Quickly installed

Uniformed droplets reducing the risks from Legionella

Ballymore Eustace, Co. Kildare
Tel: +353 45 863 220 Fax: +353 45 864 146
E-mail: info@pcpgroup.ie

Operation And Maintenance

Manual

Odour & Dust Control Specialists

Prepared for

PCP group

Tel: 045 863 220

Fax: 045 864 146

Web: www.pcpgroup.ie

Contents

The use of sprayed water to dispel dust in all areas is a well-entrenched idea, even if operators have recognized for years that it is wasteful of water, profligate with electricity, and not particularly effective.

Even so, it has been the best solution available, and there has been little choice but to use it whatever its defects. But now, PCP group has developed a new system for controlling dust which is dramatically better than sprayed water on all counts -- cost of installation, cost of usage, and above all, effectiveness.

PCP group took an idea, which in principle, has been around for many years - atomising water to create a light and enduring mist with droplets of a precise size chosen for each situation, rather than the traditional, haphazardly controlled spray, which soon falls to the ground.

A single Miniat Atomiser can create a fog and propel it for 30 linear meters, taking almost all the dust out of the atmosphere in the process. Typically, a single litre of water is as effective as up to 100 litres in a conventional system. Miniat Atomisers can produce an effective fog from as little as 2 litres per minute .

The machines can be wall-mounted or floor-mounted, for intensive unsupervised use. PCP even offer a remote control version, so an operator can use a key fob remote control unit to switch the atomiser on and off as conditions change without even leaving his working position.

The new design means:

- there is little chance of blockage, a major problem with traditional nozzles
- PCP Atomisers can operate in dust-loaded and aggressive environments

Since the atomizing head uses only 200w of electricity, and the whole system needs only around a kilowatt, they can be run off a standard 240v single phase or 415v three-phase electricity supply.

Miniat Atomisers work with most liquids and for dust suppressing situations water is typically used - PCP group is in the later stages of research work on an additive, which contains surfactant reagents that reduce the surface tension of the water and make it even more effective at combining with dust particles.

Warranty
12 months from

CAUTION: All necessary steps have been taken to ensure, as far as is practical, that Miniat Atomisers are designed and manufactured to be safe when used properly. These instructions are however, general and it is important that the user observes all statutory plant and other safety requirements. It is further assumed that the Miniat Atomiser will be installed and used by appropriately qualified, experienced and competent people, for whom these instructions have been written.

Intended use

All PCP group Miniat Atomisers are specifically designed to operate as Odour Control & Dust suppression systems, unless otherwise stated.

Under NO circumstances should a Miniat Atomiser be used for any other purpose other than that which it was originally intended without prior consultation and approval in writing from PCP Group

Any work undertaken to modify any aspect of the Atomiser, including purpose of use, must not take place without prior consultation and approval in writing from PCP group, failure to do so will render any warranty, guarantee and CE marking (if applicable) invalid.

No chemical additives of any type should be used with the Miniat Atomiser system without prior consultation and approval in writing from PCP group, failure to do so will render any warranty, guarantee and CE marking (if applicable) invalid.

NOTE Use only PCP group spares to maintain warranty.

If in doubt please contact

PCP group
Tel: 353 45 863 220
Fax: 353 45 864 146

EC DECLARATION OF CONFORMITY

i. As detailed under the European Machinery Directive 89/392EEC (amended by 91/368/EEC) and under the UK legislation the supply of Machinery (Safety) Regulations 1992 (SI 1992/3073).

ii.The Electromagnetic Compatibility Directive 89/336/EEC (amended by 91/263/EEC & 92/31/EEC) and the UK legislation, the Electromagnetic Compatibility Regulations 1992
iii.The European Low Voltage Directive 73/23/EEC (amended by 93/68/EEC) and the UK legislation, the Electrical Equipment (Safety) Regulations 1994 the Declaration of Conformity is provided for the following equipment:-

Equipment Miniat Atomising Control Unit

Manufacturer & Supplier into the EU.
PCP Group.
PCP House
Ballymore Eustace,
Co. Kildare
Ireland

Transposed Harmonised Standards
BSEN 292-1 & 2; BSEN 294; BSEN 953;
BSEN 60204-1
BSEN 50081 Part 2,
BSEN 50082 Part 2
Other Standards
BS 5378 Parts 1 & 3

Name & Address of the Responsible Person within the EU

Name: Ross Murphy
Address: PCP Group
PCP House
Ballymore Eustace,
Co Kildare

Signature of the Responsible Person (or Person Empowered to Sign on their behalf)

Signature.....*Ross Murphy*.....

Name.....Ross Murphy.....

Date.....4 February 2005.....

Operating Procedure

Start up procedure

1. Check mains water valve is set to the **on** position

2. Set isolator to **on** position
3. Turn on toggle switch to activate the probe unit
4. Check isolator on Panoramic enclosure is set to **on**
5. Check AiroNaut™ level, replenish if necessary
6. Set flow meter to desired level – 0 to 180 litres per hour

Shut down procedure

1. Switch off Miniat atomiser toggle switch
2. Set isolator to **off** position on main control panel
3. Close main water valve if required

Refer to main electrical drawings enclosed in this manual

Fault Finding

System won't start: -

- Turn off isolator, check fuses. If blown replace fuse, switch isolator on.
- If still no start contact PCP group immediately.

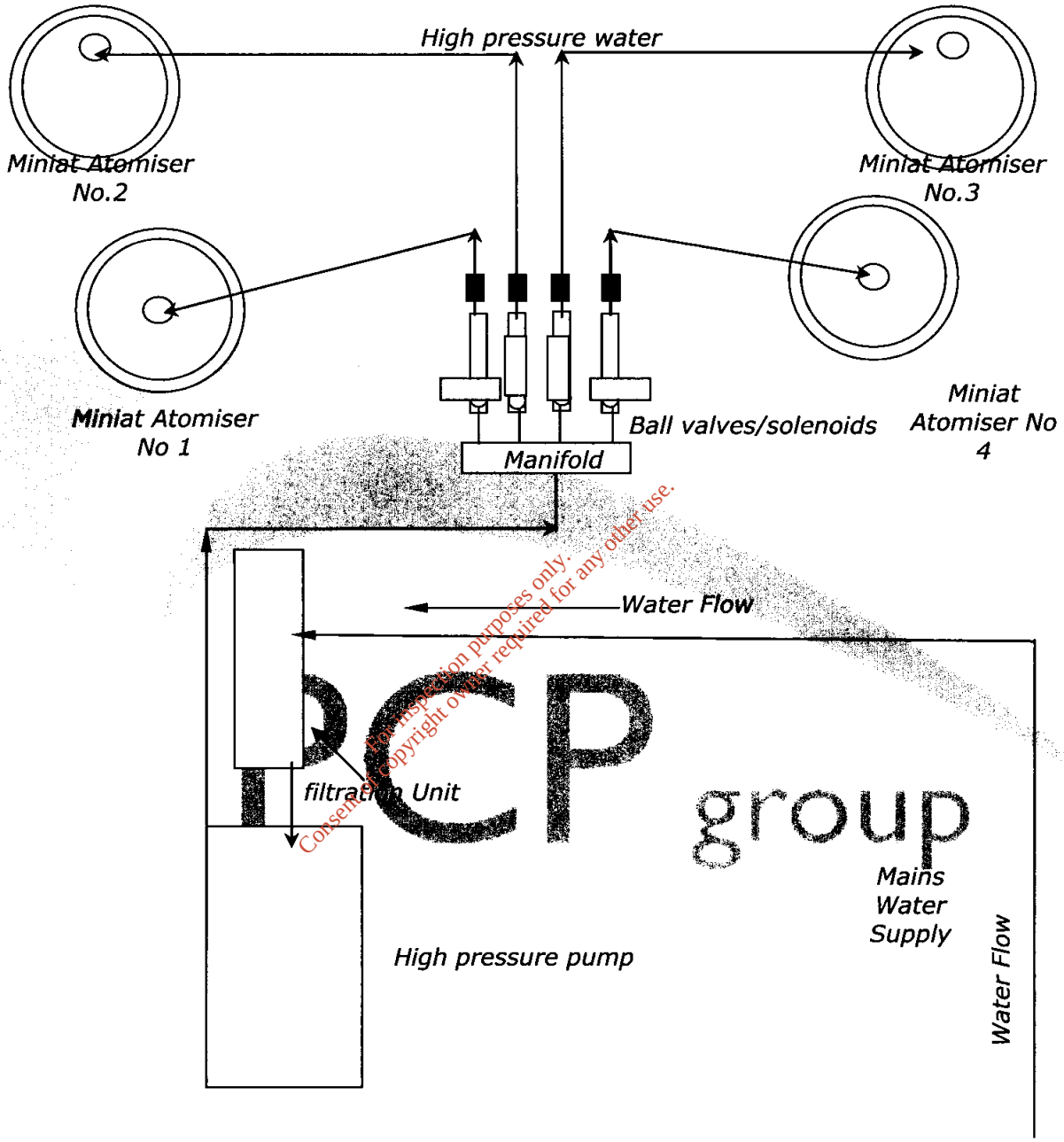
Odalim/Odaneut not dosing: -

- Check water valve is in the on position and going through dosing pump and that water is at full pressure
- Push down black bleed valve on top of dosing pump to release any trapped air (refer to Prosatron handbook)

If in any doubt please contact PCP group: 00 353 45 863 220

Water Supply

Mains Water supply is delivered to the High pressure pump, via cartridge Filter (1/5 micron) and is then sprayed from the Miniat Atomiser head (2 ltrs/min). Each head is individually controlled via manual ball valve/ solenoid



Electrical Supply

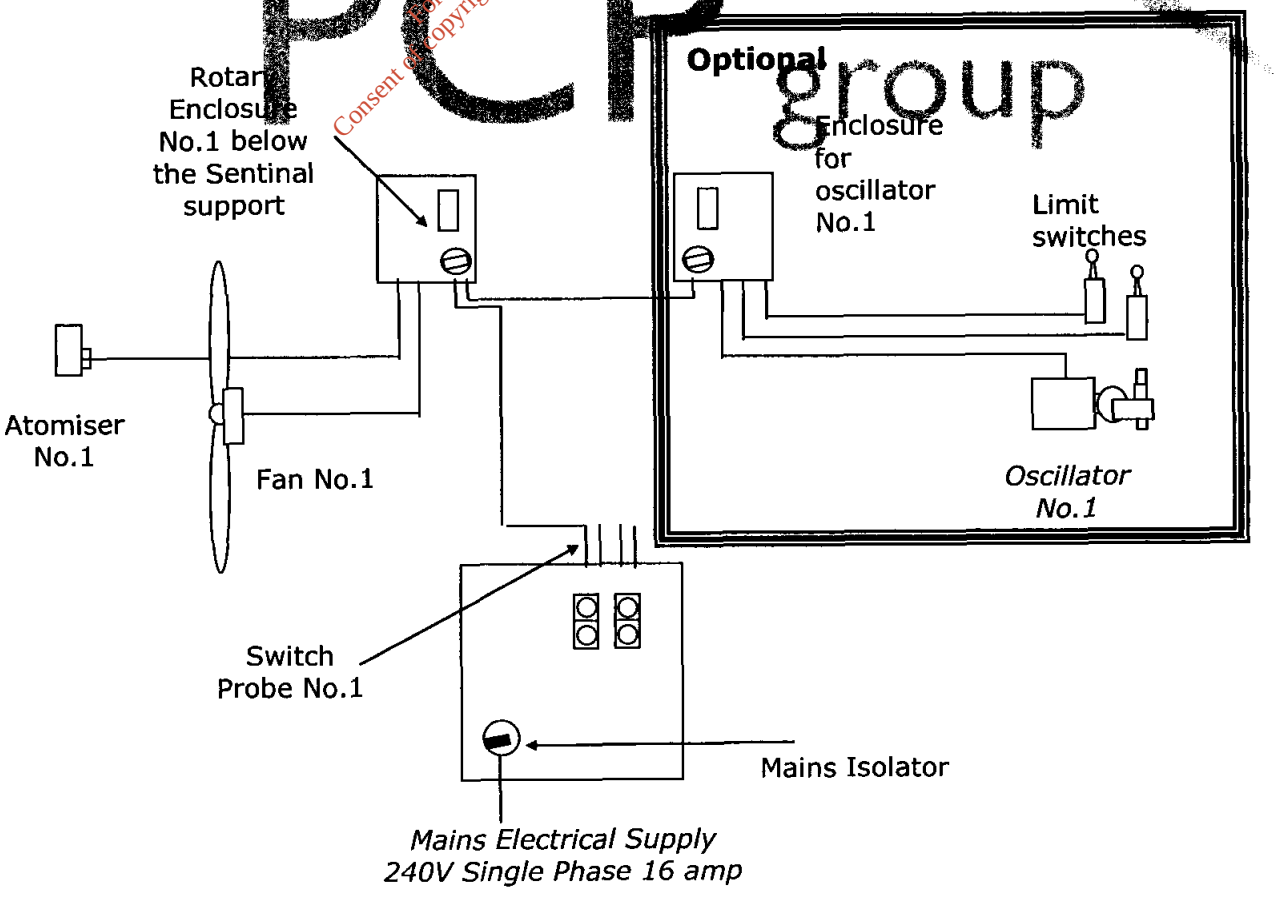
Inverter Parameters

The operation and characteristics of the inverter are controlled by parameters, which are entered from a keypad, shown on a liquid crystal display and stored in a non-volatile memory in the unit.

Full details of the procedure to read and change the parameters are given in the supplied Mitsubishi Inverter handbook enclosed.

DO NOT try and make alterations to inverter. Expensive damage will occur which you will be charged for!

It is important that when making any adjustment to the Miniat Atomizing unit, the operator is kept out of the danger zone. The unit must be isolated from the electricity supply.



Electrical Diagram

Miniat Specification
Using a 450mm fan mounted at the back of the cowl to blow air over the Miniat Atomiser head which propels the droplets up to 15 metres up to 30 metres from the Atomiser.

Number of droplets per litre of Liquid

It should be noted that the Miniat Atomiser is capable of producing a 5 to 47 micron droplet.

Miniat Rotary Atomiser

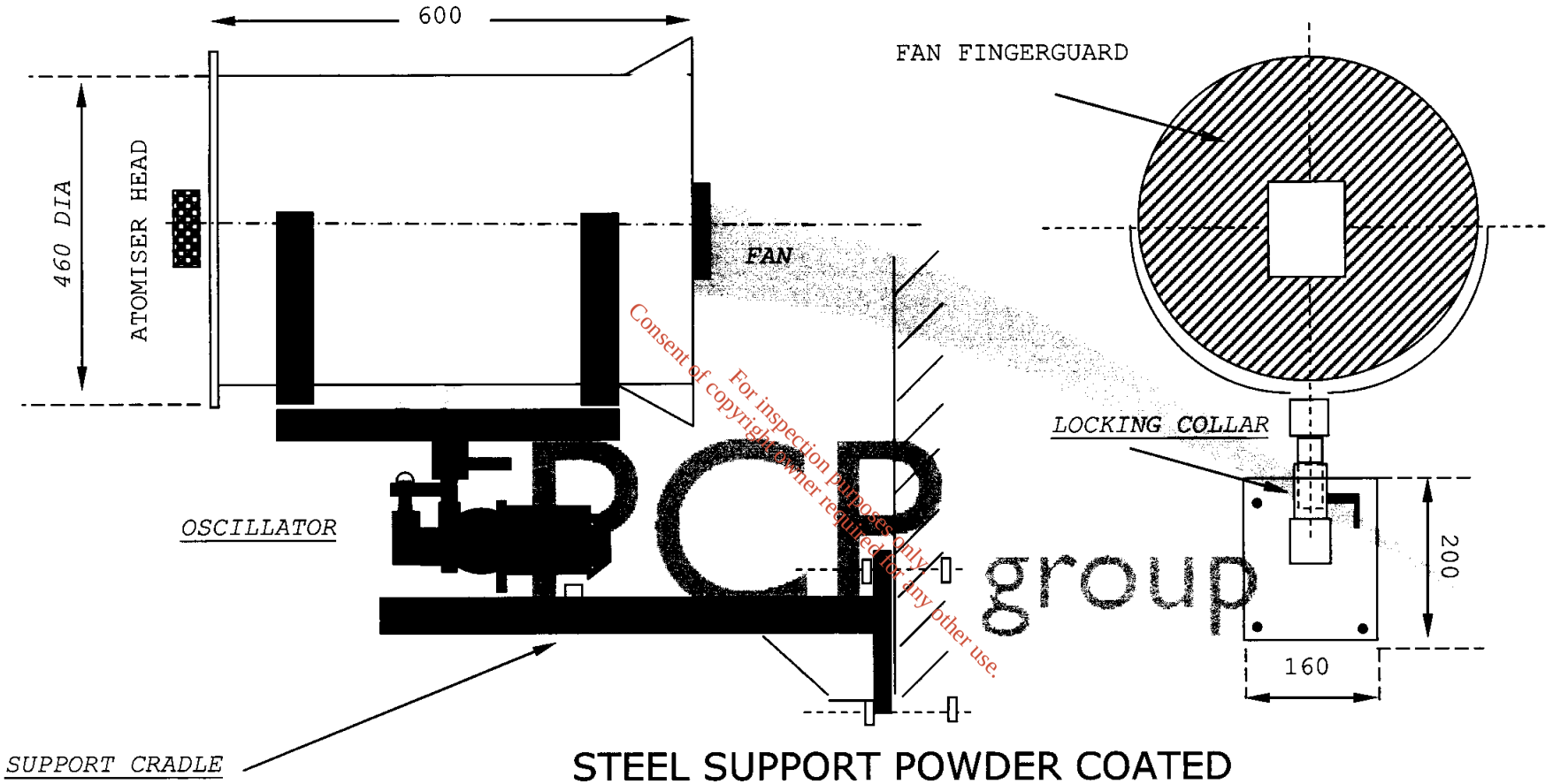
Dimensions	225 L x 110 W x 125 H
Power Input to Inverter	240 V AC single phase 415 V AC three phase
Droplet size	5 – 47 microns VMD
Noise Level	Below 40 dB(A)
Weight	.4 Kg
Flow rate	2 litres per min

Fan Cowl housed in support Cradle

Dimensions	450 Diameter 600 length
Power Input	240 V AC single phase 415 V AC three phase
Volume of Air	3000 m³/hour
Noise level with atomiser	Below 70 dB(A)
Total Weight: Fan, Cowl, Atomiser, Cradle	37 Kg
Motor Protection rating	IP54

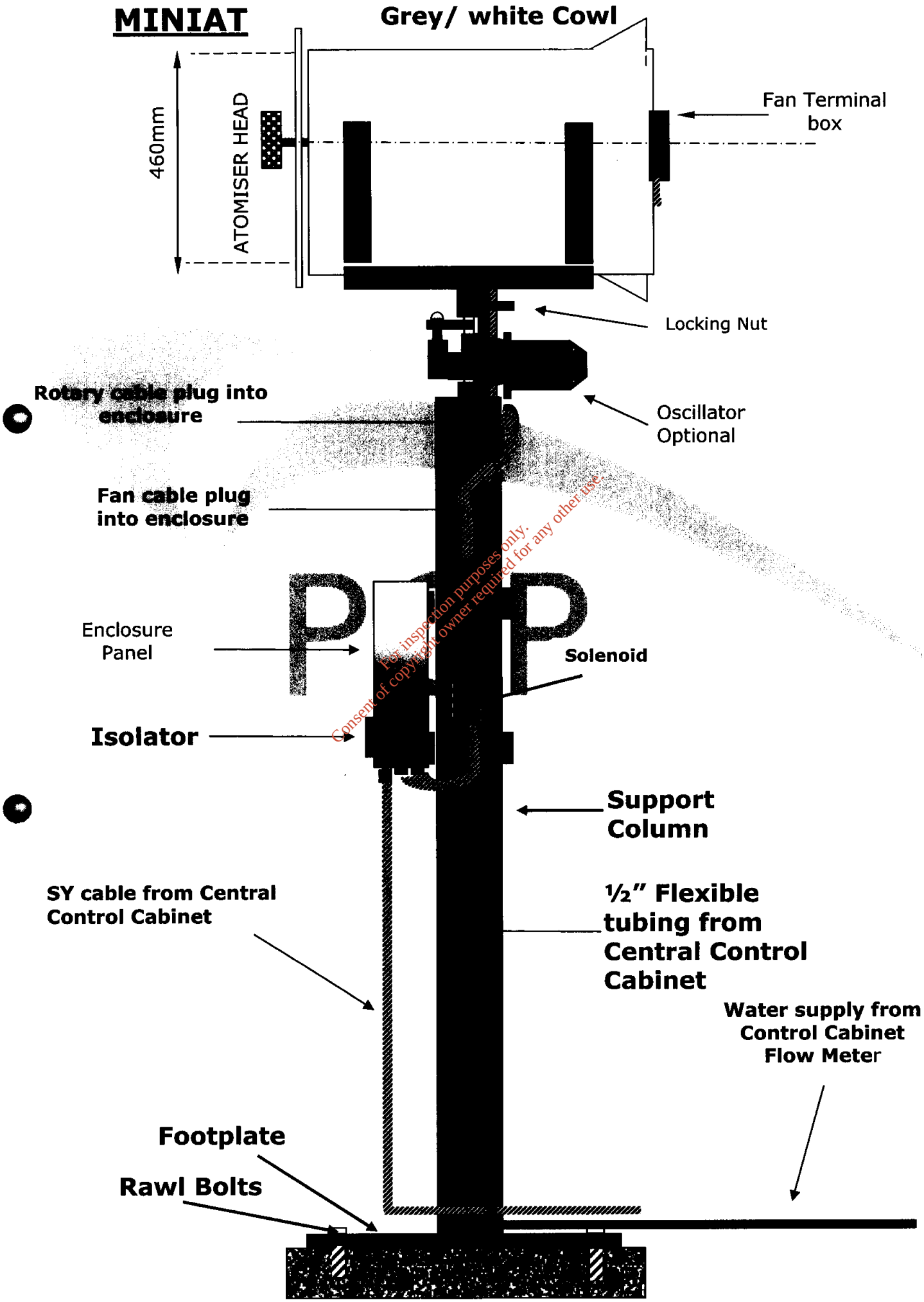
Power Consumption

Test equipment used	Econtrol VIS System 3 Energy Analyser Serial No.1632 Data below for **4 Miniat Oscillating Atomisers.**			
Base voltage Level	Red Phase & N –244.2 volts Yellow Phase & N –244.3 volts Blue Phase & N –247.0 volts			
With all miniats running phase currents are as follows:	Red Phase 6.9 Amps	Yellow Phase 3.17	Blue Phase 4.78	
Power consumption with all 4 probes running			3.350kW	
Peak power on start up for a very short duration			6.7kW	
Recommended power supply	220 volts	1 Phase	16 Amps	Preferably 32 Amps



STEEL SUPPORT POWDER COATED BLUE

MINIAT OSCILLATOR DIAGRAM



Maintenance

It is important when making any adjustment on the Miniat Atomising unit that the operator is kept out of the danger zone. The unit must be isolated from the electricity supply and mains water supply.

The Miniat Atomiser requires very little maintenance. However detailed below are a few tips to get the best out of your system.

Fan

a. Brush the fan guard at the rear of the Gray Cowl to prevent dust build up. We recommend this procedure once a quarter depending on the environment in which units are located

Dosing Unit

a. Please refer to your Proportional Injector Users Manual Dosatron

Inverter

Please refer to your Inverter Manual

Filtration

a. Please ensure that the filter cartridge is replaced at least every month.

Sterilization

a. Please refer to your Ultra Violet lamp module Manual for service schedule

Note:

As water vapour is generated by our atomizers, we strongly recommend the use of UV sterilization on the water being supplied to our system. This sterilization should take place immediately prior to the High pressure pumps.

Appendix E

ODOUR & Environmental Engineering Consultants

Unit 32 De Granville Court, Dublin Rd, Trim, Co. Meath

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ODOUR IMPACT ASSESSMENT OF COUNTRY CLEAN RECYCLING LTD LOCATED IN CHURCHFIELD INDUSTRIAL ESTATE, JOHN F CONNOLLY RD, CORK.

PERFORMED BY ODOUR MONITORING IRELAND ON BEHALF OF COUNTRY CLEAN RECYCLING LTD

PREPARED BY:	Dr. Brian Sheridan
DATE:	06th October 2011
REPORT NUMBER:	2011A300(2)
DOCUMENT VERSION:	Document Ver. 002
REVIEWERS:	Mr. Flor Crowley

TABLE OF CONTENTS

Document Amendment Record

Client: ***Country Clean Recycling Ltd.***

Title: Odour impact assessment of Country Clean Recycling Ltd located in Churchfield Industrial estate, John F Connolly Rd, Cork.

Project Number: 2011A300(2)			**Document Reference:** Odour impact assessment of Country Clean Recycling Ltd located in Churchfield Industrial estate, John F Connolly Rd, Cork.		
2011A300(1)	Document for review	BAS	JWC	BAS	01/10/2011
2011A300(2)	Minor amendments	FC	BAS	BAS	06/10/2011
Revision	**Purpose/Description**	**Originated**	**Checked**	**Authorised**	**Date**

1. Executive Summary

Odour Monitoring Ireland was commissioned to perform an odour impact assessment of the existing and proposed operations to be implemented in the Country Clean Recycling Ltd facility. The site operations involve the separation, bulking and transfer of waste from the site. This process occurs at present in the absence of odour complaints from nearby industrial receptors.

The proposed operations will involve the installation of an organic separation process for municipal solid waste (MSW) through the installation of a shredder, trommel drum screen and associated conveyors and picking stations / baler. The addition of this separation process has the capacity to significantly increase odour emissions from the existing site operations.

Potential odour sources were identified and were used to construct the basis of the modelling assessment. Odour emission rates/fluxes were calculated from collected olfactometry data gathered on site during existing operations. Odour dispersion modelling was used to perform an impact assessment of three scenarios and allow comparison of impact area with established odour dose response impact criteria. The displaced volumetric airflow rate from the recycling building was calculated using building characteristics and input factors from the Warren Springs model and the operation sequence of doorways.

Three data sets for odour emission rates were calculated to determine the potential odour impact of Country Clean Recycling Ltd operations. These included:

Ref Scenario 1: Predicted overall odour emission rate from existing Country Clean Recycling facility operations (*see Table 4.2*).

Ref Scenario 2: Predicted overall odour emission rate from proposed Country Clean Recycling facility operations with the implementation of odour mitigation (*see Table 4.3*).

Ref Scenario 3: Predicted overall odour emission rate from proposed Country Clean Recycling facility operations with the implementation of further odour mitigation (*see Table 4.4*).

Aermod Prime (11103) was used to determine the overall odour impact of each Scenario as set out in odour impact criteria presented in *Section 3.4.4*. The output data was analysed to calculate:

Ref Scenario 1:

- Predicted odour emission contribution of overall existing Country Clean Recycling facility operation (*see Table 4.2*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 15 Ou_E/m^3 (*see Figure 8.2*) for 5 years of screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 1.

Ref Scenario 2:

- Predicted odour emission contribution of overall proposed Country Clean Recycling facility operation (*see Table 4.3*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 6.0 Ou_E/m^3 (*see Figure 8.3*) for 5 years of screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 2 – Stage 1 mitigation.

Ref Scenario 3:

- Predicted odour emission contribution of overall proposed Country Clean Recycling facility operation (*see Table 4.4*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 3.0 Ou_E/m^3 (*see Figure 8.4*) for 5 years of

screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 3 – Stage 2 mitigation.

These computations give the odour concentration at each Cartesian grid receptor location that is predicted to be exceeded for 2% (175 hours) of five years of hourly meteorological data providing approximately 43,350 hourly computations with the worst case year selected for data presentation.

It was concluded that:

1. The current site processes are operating in the absence of generated odour complaints from nearby industrial receptors and therefore requires no mitigation techniques to be installed. Good housekeeping techniques (such as keep yard area clean, ensure all wet waste is bulked and transferred within 24 hrs and closed door management, etc) should be improved and maintained on the site to ensure no generation of complaints.
2. With regard to Scenario 1 and 2, in accordance with odour impact criterion in *Table 2.2*, and in keeping with current recommended odour impact criterion in this country, a number of industrial residences in the vicinity of the proposed operations may perceive odour impact as a result of emissions from the new processes if odour mitigation is not implemented. No complaints pertaining to odours have been received by the facility and the facility is located in a light industrial estate with no residential receptors in close proximity.
3. With regards to Scenario 3, In accordance with odour impact criterion in *Table 2.2*, and in keeping with current recommended odour impact criterion in this country, no odour impact should be perceived by industrial neighbours in the vicinity of the facility if odour mitigation as detailed within the report is implemented into the facility design.
4. Management, operational and odour mitigation protocols will lead to a reduction in overall emissions of offensive odours and markedly reduce the odour impact area. It is predicted that no industrial neighbours will perceive odour impact following the implementation of these protocols. Those management and mitigation strategies discussed throughout this document should be considered and implemented to ensure no odour impact and best international practice should be maintain in the operation of the facility in terms of odour mitigation.

The following recommendations were developed during the study:

1. Maintain and improve good housekeeping practices (i.e. keep yard area clean, building floor and waste transfer activities indoors, clean roughly any residual solids from the building, etc.), closed-door management strategy and interlocked throughout the building in which this process is to be located (i.e. to eliminate puff odour emissions from the building).
2. Ensure separated organic material is stored within enclosed vessels / bays and removed off site within 24 hours of acceptable / generation.
3. Ensure MSW material is stored within a bay and removed off site within 24 hours of acceptable / generation. Any leachate generated should be drained to closed sumps and all spillage area cleaned up at end of working day.
4. For stage 1 implementation, interlock all doors, seal apex, eves, along concrete push wall, flashing on doors and at top of doors etc to improve building integrity.
5. An odour management plan and auditing procedure should be operated and maintained throughout facility operations.

2. Introduction

Odour Monitoring Ireland was commissioned by Country Clean Recycling Ltd to perform an odour sampling and odour dispersion modelling assessment of the existing / proposed operations to be located in Country Clean Recycling Ltd, Churchfield Industrial Estate, John F. Connolly Rd., Cork.

The existing and proposed site operations involve the separation, bulking and transfer of various waste streams from the site. This report will only consider odourous waste streams such as source segregated food waste and municipal solid waste (MSW) streams. At present, the facility accepts MSW into the facility and this is then bulked and transported off site with a 24 to 48 hour time period. Source segregated waste streams are also accepted into the facility and this is bulked and transported off site for further treatment. This process occurs at present in the absence of any odour complaints from nearby industrial receptors.

For proposed mechanical separation operations, library based odour emission data gathered on other similar waste management facilities was used in conjunction with actual gathered data on site to develop an odour emission data set for the proposed facility operations.

This document will present the collected odour threshold concentration data and the dispersion modelling scenarios generated for the existing and proposed site operations. Materials and methods, assumptions, results and discussion and conclusions are presented within this document.

3. Materials and Methods

This section will describe the materials and methods used throughout the study period.

3.1. Odour sampling and analysis

3.1.1. Odour sampling techniques

In order to obtain air samples for odour assessment, a static sampling method was used where air samples were collected in 40 to 60 litre pre-conditioned Nalophan^{NA} bags using a vacuum sampling device over a 5 to 10 minute period. The sampler operates on the 'lung principle', whereby the air is removed from a rigid container around the bag by a battery powered SKC vacuum pump at a rate of 5 to 9 *l* min^{-1}. This caused the bag to fill through a stainless steel and PTFE tube whose inlet is placed in ambient air, with the volume of sample equal to the volume of air evacuated from the rigid container. Samples were taken within the headspace of the building. Doors 1 and 2 were open during the sampling exercise.

3.1.2. Olfactometry

Olfactometry using the human sense of smell is the most valid means of measuring odour (Dravniek et al, 1986) and at present is the most commonly used method to measure the concentration of odour in air (Hobbs et al, 1996). Olfactometry is carried out using an instrument called an olfactometer. Three different types of dynamic dilution olfactometers exist:

- Yes/No Olfactometer
- Forced Choice Olfactometer
- Triangular Forced Choice Olfactometer.

In the dynamic dilution olfactometer, the odour is first diluted and is then presented to a panel of screened panellists of no less than four (CEN, 2003) Panellists are previously screened to ensure that they have a normal sense of smell (Casey et al., 2003). According to the CEN standard this screening must be performed using a certified reference gas *n*-butanol. This screening is applied to eliminate anosmia (low sensitivity) and super-noses (high sensitivity). The odour analysis has to be undertaken in a low odour environment such as an air-conditioned odour free laboratory. Analysis should be performed preferably within 8 to 12 hours of sampling.

3.1.3. Odour measurement in accordance with the EN13725:2003

An ECOMA TO8 dynamic yes/no olfactometer was used throughout the measurement period to determine the odour threshold concentration of the sample air. The odour threshold concentration is defined as the dilution factor at which 50% of the panel can just detect the odour. Only those panel members who pass screening tests with n-butanol (certified reference gas, CAS 72-36-3) and who adhered to the code of behaviour were selected as panellists for olfactometry measurements (CEN, 2003). Odour measurement was carried out in an odour free laboratory in accordance with EN13725:2003. The analyses were carried out in the laboratory of Odour Monitoring Ireland in Trim Co. Meath.

3.1.4. What is an odour unit?

The odour concentration of a gaseous sample of odourant is determined by presenting a panel of selected screened human panellists with a sample of odourous air and varying the concentration by diluting with odourless gas, in order to determine the dilution factor at the 50% detection threshold. The Z_{50} value (threshold concentration) is expressed in odour units (Ou_E m^{-3}).

The European odour unit is that amount of odourant(s) that, when evaporated into one cubic metre of neutral gas (nitrogen), at standard conditions elicits a physiological response from a panel (detection threshold) equivalent to that elicited by one European Reference Odour Mass (EROM) evaporated in one cubic meter of neutral gas at standard conditions. One EROM is that mass of a substance (n-butanol) that will elicit the Z_{50} physiological response assessed by an odour panel in accordance with this standard. *n*-Butanol is one such reference standard and is equivalent to 123µg of n-butanol evaporated in one cubic meter of neutral gas at standard conditions (CEN, 2003).

3.2. Volumetric airflow rate calculation.

In order to ascertain the volumetric airflow rate as a result of the wind positive pressure on the building envelope, the Warren Springs model was used whereby, the total area of potential leakage was estimated based on the building characteristics and fitted to the model equation and average high wind speed for this area of Ireland. An average wind flow of 5 m/s was taken from a combination of meteorological file analysis and data presented by the Irish Meteorological Society.

The following equation was used: Q_1=0.75 AU

Where Q_1 = infiltration rate (m^3/s)
A = infiltration area (m^2)
U = wind speed (m/s)

The excess heat generated by the process is not accounted for in this calculation and the maximum wind speed used is based on an average high for the locality. This therefore remains on the relaxed side in terms of the overall infiltration rate and displacement from the building. It is likely that the infiltration rate and displacement volume will always be greater at average high wind speeds.

In addition, following a review of the building fabric, it was assumed that the existing building fabric would incur a minimum leakage rate of approximately 10 m^3/m^2 clad surface/hr. Two doorways remain open at present throughout daily operations. It is assumed that half the open doorway will act as an air inlet and half will act as an air outlet. Leakage from the building fabric is assumed to only occur from the building roof when doorways are closed (as the building will tend not to pressurize when doorway are opened.

In terms of door management, this can be improved through a number of mechanisms to include:

- Ensure doorways 1 and 2 are interlocked so that either or door cannot be opened at the same time, thereby forming wind tunnel effects within the building.
- Consider the installation of doors that open and close in a faster time period. Currently, it takes 3 minutes for 1 door to fully open and close in one sequence.
- Where possible attach curtains to the top of the door so as to reduce the open surface area of the doorway and thereby reduce odour emissions from the open doorway.
- Ensure that doorway 3, 4 and 5 remain close and also are interlocked into the process.

These changes will lead to a significant reduction in the level of odour emissions leaving the facility building. Typically, odour levels will reduce by up to 50% from open doorways as a result of these changes.

In terms of the building fabric, the following considerations should be implemented where possible. These include:

- Ensure all clad surface is in good condition and no clad is missing of any building area,
- Ensure all gaps in the building clad are filled in, closed up and flashed appropriately,

- Consider the sealing of the eves, apex, rising concrete push wall, corners of building and all flashed surfaces with expanding foam so as to improve the leakage rate on the building.

Since doorways will be closed and building pressurisation will become a more common occurrence including wind pressure effects on the building, this will lead to a significant reduction in odour emissions leaving the building. It is anticipated that the expanding foam application (to surfaces where it is needed to improve integrity including clad sheet interface between sheets) and flashing (around doorways, rising concrete push wall etc) will bring the air leakage rate down to a value of 5 m^3/m^2 clad / hr.

The overall volumetric airflow rate from each identified source is presented in *Table 4.1* for each scenario.

3.3. Odour emission rate calculation.

The measurement of the strength of a sample of odourous air is, however, only part of the problem of quantifying odour. Just as pollution from a stack is best quantified by a mass emission rate, the rate of production of an odour is best quantified by the odour emission rate. For a chimney or ventilation stack, this is equal to the odour threshold concentration (Ou_E m^{-3}) of the discharge air multiplied by its flow-rate (m^3 s^{-1}). It is equal to the volume of air contaminated every second to the threshold odour limit (Ou_E s^{-1}). The odour emission rate can be used in conjunction with dispersion modelling in order to estimate the approximate radius of impact or complaint (Hobson et al, 1995).

Area source mass emission rates/flux were calculated as either Ou_E m^{-2} s^{-1} or Ou_E s^{-1} depending if they are being represented as discrete point sources or area sources in the atmospheric dispersion model.

3.4. Dispersion modelling

3.4.1. Atmospheric dispersion modelling of odours: What is dispersion modelling?

Any material discharged into the atmosphere is carried along by the wind and diluted by wind turbulence, which is always present in the atmosphere. This process has the effect of producing a plume of air that is roughly cone shaped with the apex towards the source and can be mathematically described by the Gaussian equation. Atmospheric dispersion modelling has been applied to the assessment and control of odours for many years, originally using Gaussian form ISCST 3 and more recently utilising advanced boundary-layer physics models such as ADMS and AERMOD (Keddie et al. 1992). Once the odour emission rate from the source is known, (Ou_E s^{-1}), the impact on the vicinity can be estimated. These models can effectively be used in three different ways: firstly, to assess the dispersion of odours and to correlate with complaints; secondly, in a "reverse" mode, to estimate the maximum odour emissions which can be permitted from a site in order to prevent odour complaints occurring; and thirdly, to determine which process is contributing greatest to the odour impact and estimate the amount of required abatement to reduce this impact within acceptable levels (McIntyre et al. 2000). In this latter mode, models have been employed for imposing emission limits on industrial processes, odour control systems and intensive agricultural processes (Sheridan et al., 2002).

3.4.2. AERMOD Prime

The AERMOD model was developed through a formal collaboration between the American Meteorological Society (AMS) and U.S. Environmental Protection Agency (U.S. EPA). AERMOD is a Gaussian plume model and replaced the ISC3 model in demonstrating compliance with the National Ambient Air Quality Standards (Porter et al., 2003) AERMIC

(USEPA and AMS working group) is emphasizing development of a platform that includes air turbulence structure, scaling, and concepts; treatment of both surface and elevated sources; and simple and complex terrain. The modelling platform system has three main components: AERMOD, which is the air dispersion model; AERMET, a meteorological data pre-processor; and AERMAP, a terrain data pre-processor (Cora and Hung, 2003).

AERMOD is a Gaussian steady-state model which was developed with the main intention of superseding ISCST3 (NZME, 2002). The AERMOD modeling system is a significant departure from ISCST3 in that it is based on a theoretical understanding of the atmosphere rather than depend on empirical derived values. The dispersion environment is characterized by turbulence theory that defines convective (daytime) and stable (nocturnal) boundary layers instead of the stability categories in ISCST3. Dispersion coefficients derived from turbulence theories are not based on sampling data or a specific averaging period. AERMOD was especially designed to support the U.S. EPA's regulatory modeling programs (Porter at al., 2003). Special features of AERMOD include its ability to treat the vertical in-homogeneity of the planetary boundary layer, special treatment of surface releases, irregularly-shaped area sources, a three plume model for the convective boundary layer, limitation of vertical mixing in the stable boundary layer, and fixing the reflecting surface at the stack base (Curran et al., 2006). A treatment of dispersion in the presence of intermediate and complex terrain is used that improves on that currently in use in ISCST3 and other models, yet without the complexity of the Complex Terrain Dispersion Model-Plus (CTDMPLUS) (Diosey et al., 2002).

3.4.3. Model assumptions

The approach adopted in this assessment is considered a worst-case investigation in respect of emissions to the atmosphere from the operational facility. These predictions are therefore most likely to over estimate the GLC's that may actually occur for each modelled scenario. These assumptions are summarised and include:

The approach adopted in this assessment is considered a worst-case investigation in respect of emissions to the atmosphere from the existing operations. These predictions are therefore most likely to over estimate the GLC that may actually occur for each modelled scenario. These assumptions are summarised and include:

- Emissions to the atmosphere from the existing operations (open doorways) were assumed to occur 9 hours each day / 7 days per week over a standard year at 100% output for all sources. All building leakage sources were assumed to occur 15 hrs per day when the facility doorways were not in use.
- Five years of hourly sequential meteorological data from Cork 2003 to 2007 inclusive was used in the modelling screen which will provide statistical significant results in terms of the short and long term assessment. The worst case year 2004 was used for data analysis. This is in keeping with guidance. In addition, AERMOD incorporates a meteorological pre-processor AERMET PRO. The AERMET PRO meteorological preprocessor requires the input of surface characteristics, including surface roughness (z0), Bowen Ratio and Albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. The values of Albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use type was carried out to a distance of 10km from the meteorological station for Bowen Ratio and Albedo and to a distance of 1km for surface roughness in line with USEPA recommendations.
- All emissions were assumed to occur at maximum potential emission concentration and mass emission rates for each scenario and were assumed to occur for 9 hours per day, 365 days per year, simultaneously (when the facility is in operation). The leakage from the building was assumed to occur 15 hours per day when the building doors are closed.
- AERMOD Prime (11103) dispersion modelling was utilised throughout the assessment in order to provide the most conservative dispersion estimates.
- All building wake affects were assessed within the dispersion model.

- Topographical data was inputted into the model in order to take account of any rolling terrain in the vicinity of the site (which is the case in this instance).

3.4.4. Odour impact criterion for waste odours

Odours from waste handling operations arise mainly from the volatilisation of odourous gases from:

- The surfaces of the received waste
- Mechanical processing activities within the building,
- Anaerobic decay of organic matter within the waste,
- Storage of waste within the facility buildings for prolonged periods of time (greater than 24 hrs),
- Inefficient odour management and design including loose building fabric, poor facility and door management, inefficient extraction and odour control.

Any process change which will improve / reduce the nature of the elements above will lead to reduction in potential odour release.

An odour impact criterion defines the odour threshold concentration limit value above baseline in ambient air, which will result in an odour stimulus capable of causing an odour complaint. There are a number of interlinked factor, which causes a nearby receptor (i.e. resident) to complain. These include:

- Odour threshold concentration, odour intensity and hedonic tone-defined measurable parameters at odour source,
- Frequency of odour-how frequently the odour is present at the receptor location,
- Duration of odour-how long the odour persists at the receptor location,
- Physiological-previous experiences encountered by receptor, etc.

By assessing these combined interlinked factors, the ability for a facility to cause odour complaint can be determined. As odour is not measurable in ambient air due to issues in sampling techniques, limit of detections for olfactometers and the inability to monitor continuously, therefore dispersion models become useful tools in odour impact assessments and odour risk analysis. Dispersion modelling also allows for the assessment of proposed changes in processes within the facility without actually having to wait for the processes to be changed (i.e. predictive analysis).

Impacts from the facility operations are assessed in accordance with the following requirements. These include:

1. EPA guidance documents "Odour impacts and odour emission control measures for intensive agriculture, EPA, 2001,

2. AG4 - Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) and

3. H Horizontal Guidance notes (2010), UK Environment Agency

Based on these publications, a value of less than 3.0 Ou_E/m^3 at the 98^{th} percentile of hourly averages for 5 years of screened hourly sequential meteorological data was examined as this was considered the most appropriate odour impact criterion as this facility is located in an light industrial estate with other similar industry in the vicinity of the site.

3.5. Meteorological data.

Five years of hourly sequential meteorological data was chosen for the modelling exercise (i.e. Cork 2003 to 2007 inclusive). A schematic wind rose and tabular cumulative wind speed and directions of all five years are presented in *Section 11*. All five years of met data was screened to provide more statistical significant result output from the dispersion model. The worst case year 2004 was used for data presentation. This is in keeping with national and international recommendations on quality assurance in operating dispersion models and will provide a worst case assessment of predicted ground level concentrations based on the input emission rate data. Surface roughness, Albedo and Bowen ratio were assessed and characterised around Aldergrove met station for AERMET Pro processing.

3.6. Terrain data.

Topography effects were accounted for within the dispersion modelling assessment as terrain was considered complex in the vicinity of the site. 10 m spaced XYZ column format topographical data as gathered from Ordnance survey Ireland was pre-processed using AERMAP (11103) for the dispersion modelling area in order to allow for the characteristics of terrain to be accounted for in the model. A total fine grid area of 0.16 km sq and a course grid area of 1.0 km sq were examined within the dispersion modelling assessment giving a total receptor grid number of 2,122 receptor points in the assessment area.

3.7. Building wake effects

Building wake effects are accounted for in modelling scenarios through the use of the Prime algorithm (i.e. all building features located within the facility) as this can have a significant effect on the compound plume dispersion at short distances from the source and can significantly increase GLC's in close proximity to the facility. All building structures and stack heights and orientations were inputted into the dispersion model in order to allow for wake effects to be taken in to account in the calculations. The latest BPIP version (04274) was utilised in the analysis.

4. Results

This section will present the results obtained from the study.

4.1. Volumetric airflow rate calculations for Scenarios 1 to 3

Table 4.1 presents the results for the volumetric airflow rate estimation and calculation for the recycling building. The predicted average volumetric airflow rate from the recycling building will vary depending on the Scenario. Based on the values contained in *Table 4.1*, the average volumetric airflow rate for each scenario is as follows:

Ref Scenario 1 (Door 1 and 2 opened always and leakage from fabric 1) = 278,759 m^3/hr

Ref Scenario 2 = (Door 1 and 2 interlocked (Doors 3, 4 and 5 closed), curtains installed to door 2 to reduce surface area, building fabric sealed Door 1 and 2 with opening / closing speed of 180 seconds) = 97,035 m^3/hr

Ref Scenario 3 = (Door 1 and 2, interlocked (Door 3, 4 and 5 closed), curtain installed to Door 2 to reduce surface area, building fabric sealed and fitting of new rapid roller doors to Doorway 1 and 2 with opening / closing speed of 30 seconds) = 24,000 m^3/hr.

Table 4.1. Calculated and estimated volumetric airflow rate values for dispersion modelling examination for the operational facility.

Emission point identity	Area (m^2)	Airflow velocity (m/s)	Volumetric airflow rate (Am^3/hr)	Notes
Recycling Building (leaks in fabric 1)	1,857[1]	10 m^3/m^2 clad/hr	18,570[2]	Estimated leakage rate from existing building fabric
Door 1[3]	26	50% of door as inlet and 50% as outlet	87,750	5 m/s wind speed. Assumed that each door has a maximum of 10 openings per hour. Each opening / closing requires 180 seconds = 30 minutes in open position per hour. The model output is based on a 1 hr average.
Door 2[3]	51.10	50% of door as inlet and 50% as outlet	172,440	5 m/s wind speed. Assumed that each door has a maximum of 10 openings per hour. Each opening / closing requires 180 seconds = 30 minutes in open position. The model output is based on a 1 hr average.
Door 3[3]	0	-	-	Closed
Door 4[3]	0	-	-	Closed
Recycling building (leaks in fabric following sealing 2)	1,857	5 m^3/m^2 clad/hr	9,285	Estimated leakage rate from proposed sealed building
Door 1 / 2 Proposed[4]	26	50% of door as inlet and 50% as outlet	87,750	Estimated door leakage following interlocking of doorways and fitting of curtains to top of door to reduce surface area opening of door.
Doors 1 / 2 proposed fitted with rapid roller doors	26	50% of door as inlet and 50% as outlet	14,625	Estimated door leakage following interlocking of doorways and fitting of curtains to top of door to reduce surface area opening of door and fitting of rapid roller doors with opening and closing speed of 30 seconds.

Notes: [1] denotes total clad surface area.

[2] denotes emission occurs when doors are closed as building pressure effects will occur during this time period. It is assumed that the doors remain closed between the hours of 7PM to 7AM on a daily basis.

[3] denotes that doors 1, 2, 3 and 4 are interlocked and only one door can be in the opened position at once for Scenario 2 and 3.

[4] denotes that door 1 and 2 interlocked, and door 2 fitted with curtains to reduce surface area to a value of 26 m^2.

[5] denotes that door 1 and 2 fitted with new rapid roller doors with opening and closing speed of 30 seconds.

4.2. Odour emission data for Scenarios 1 to 3

Three data sets for odour emission rates were calculated to determine the potential odour impact of the existing and proposed operational changes with mitigation protocols utilising site specific and source odour emission data. These scenarios included:

Ref Scenario 1: Predicted overall odour emission rate from existing Country Clean Recycling facility operations (*see Table 4.2*).

Ref Scenario 2: Predicted overall odour emission rate from proposed Country Clean Recycling facility operations with the implementation of odour mitigation (*see Table 4.3*).

Ref Scenario 3: Predicted overall odour emission rate from proposed Country Clean Recycling facility operations with the implementation of further odour mitigation (*see Table 4.4*).

A worst-case odour-modelling scenario was chosen to estimate worst-case odour impact from the proposed Country Clean Recycling Ltd operations.

4.3. Odour emission rates from Country Clean Recycling Ltd operations for atmospheric dispersion modelling Scenario 1, 2 and 3

Tables 4.2 and *Table 4.4* illustrates the overall odour emission rate from the existing and proposed operational changes in Country Clean Recycling Ltd with and without the implementation of odour mitigation.

As can be observed in *Table 4.2*, the overall odour emission rate from the existing Country Clean Recycling Ltd facility operations is approximately 56,371 Ou_E/s.

Table 4.3 illustrates the overall odour emission rate from the proposed operations (with Stage 1 odour mitigation) to be carried out in Country Clean Recycling Ltd. The overall source odour emission is predicted to be at or less than 39,029 Ou_E/s. This odour emission rate is based on a number of mitigation assumptions and operational changes that are explained in detail on *Table 4.3.*

Table 4.4 illustrates the overall odour emission rate from the proposed operations (with Stage 2 odour mitigation) to be carried out in Country Clean Recycling Ltd. The overall source odour emission is predicted to be at or less than 9,617 Ou_E/s. This odour emission rate is based on a number of mitigation assumptions and operational changes that are explained in detail on *Table 4.4.*

Table 4.2. Predicted overall odour emission rate from existing Country Clean Recycling facility operations (ref Scenario 1).

Description	Odour threshold conc. (Ou_E/m^3)	Volumetric airflow rate (m^3/s)	Odour emission rate (Ou_E/s)	Source type
Facility building fabric leaks	728	5.1583	3,755	Volume / Line
Odour emission through open doors 1	728	24.375	17,745	Volume
Odour emission through open doors 2	728	47.90	34,871	Volume
Total odour emission rate (Ou_E/s)	-	-	**56,371**	-

Notes: [1] denotes that all doors were open in the facility throughout the survey. There was approximately 150 tonne of MSW in the facility. The external ambient air temperature was 19 deg C.

[2] denotes that it was assumed that doors 1 and 2 remained open through the daily operation period.

[3] denotes that building fabric emission will only occur when doors are closed out of operation period. The operation period was assumed to be 8AM to 6PM Mon to Sat.

Table *4.3.* Predicted overall odour emission rate from proposed Country Clean Recycling facility operations (ref Scenario 2).

Description	Odour threshold conc. (Ou_E/m^3)	Volumetric airflow rate (m^3/s)	Odour emission rate (Ou_E/s)	Source type
Facility building fabric leaks when sealed	1,448[3]	2.5792[2]	3,734	Volume / Line
Odour emission through open doors 1 and 2 when interlocked[1]	1,448[3]	24.375	35,295	Volume
Total odour emission rate (Ou_E/s)	-	-	**39,029**	-

Notes: [1] denotes that it was assumed that doors 1 and 2 will be interlocked and the open area of door 2 reduced by means of curtains to the open area of door 1.

[2] denotes that building fabric emission will only occur when doors are closed out of operation period. The operation period was assumed to be 8AM to 6PM Mon to Sat. The building fabric sealing will be performed to reduce potential leakage during out of operation period.

[3] denotes that odour levels in building are likely to increase up to normal library recorded levels when building integrity is improved and less air infiltration occurs.

Table *4.4.* Predicted overall odour emission rate from proposed Country Clean Recycling facility operations (ref Scenario 3).

Description	Odour threshold conc. (Ou_E/m^3)	Volumetric airflow rate (m^3/s)	Odour emission rate (Ou_E/s)	Source type
Facility building fabric leaks when sealed	1,448[3]	2.5792[2]	3,734	Volume / Line
Odour emission through open doors 1 and 2 when interlocked and rapid roller door installed[1]	1,448[3]	4.0625	5,883	Volume
Total odour emission rate (Ou_E/s)	-	-	**9,617**	-

Notes: [1] denotes that it was assumed that doors 1 and 2 will be interlocked and the open area of door 2 reduced by means of curtains to the open area of door 1. Rapid roller doors will be fitted and these will reduce open time by a further 34%.

[2] denotes that building fabric emission will only occur when doors are closed out of operation period. The operation period was assumed to be 8AM to 6PM Mon to Sat. The building fabric sealing will be performed to reduce potential leakage during out of operation period.

[3] denotes that odour levels in building are likely to increase up to normal library recorded levels when building integrity is improved and less air infiltration occurs.

4.4. Results of odour dispersion modelling for the operations located in Country Clean Recycling Ltd facility

Aermod Prime (11103) was used to determine the overall odour impact of the operations carried out at Country Clean Recycling as set out in odour impact criteria contained in *Section 3.4.4*. The output data was analysed to calculate:

Ref Scenario 1:

- Predicted odour emission contribution of overall existing Country Clean Recycling facility operation (*see Table 4.2*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 15 Ou_E/m^3 (*see Figure 8.2*) for 5 years of screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 1.

Ref Scenario 2:

- Predicted odour emission contribution of overall proposed Country Clean Recycling facility operation (*see Table 4.3*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 6.0 Ou_E/m^3 (*see Figure 8.3*) for 5 years of screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 2 – Stage 1 mitigation.

Ref Scenario 3:

- Predicted odour emission contribution of overall proposed Country Clean Recycling facility operation (*see Table 4.4*), to odour plume dispersal at the 98th percentile for an odour concentration of less than or equal to 3.0 Ou_E/m^3 (*see Figure 8.4*) for 5 years of screened hourly sequential meteorological data (Cork 2004 considered worst case year) – ref Scenario 3 – Stage 2 mitigation.

These computations give the odour concentration at each Cartesian grid receptor location that is predicted to be exceeded for 2% (175 hours) of five years of screened hourly meteorological data providing approximately 43,350 hourly computations. The worst case meteorological year was utilised for data presentation as per AG4 guidance.

This will allow for the predictive analysis of any potential impact on the neighbouring sensitive locations while the facility is in operation. It will also allow the operators of the facility site to assess the effectiveness of their suggested mitigation strategies. The intensity of the odour from two or more sources of the facility operation will depend on the strength of the initial odour threshold concentration from the sources and the distance downwind at which the prediction and/or measurement is being made. Where the odour emission plumes from a number of sources combine downwind, then the predicted odour concentrations may be higher than that resulting from an individual emission source. It is important to note that various odour sources have different odour characters. This is important when assessing those odour sources to minimise and/or abate. Although an odour source may have a high odour emission rate, the corresponding odour intensity (strength) may be low and therefore it is easily diluted. Those sources that express the same odour character, as an odour impact should be investigated first for abatement/minimisation before other sources are examined as these sources are the driving force behind the character of the perceived odour.

5. Discussion of results

This section will discuss the results obtained during the study.

5.1. Odour impact from existing facility operations – ref Scenario 1

The site operations will involve the separation, bulking and transfer of waste from the site. This process occurs at present in the absence of odour complaints from nearby industrial receptors. A number of key recommendations for odour management techniques such as good housekeeping techniques (such as keep yard area and internal bulking area clean, ensure all wet waste is bulked and transferred within 24 hrs and closed door management, etc) should be maintained on the site to ensure no generation of complaints. This will ensure that existing site bulking operations can continue to be performed in the absence of complaints.

As can be observed in *Figure 8.2*, the predicted odour plume from the facility operations has a radial impact area of approximately 350m from the boundary of the site in a south east direction for an odour concentration of less than or equal to 15 Ou_E/m^3 at the 98th percentile of hourly averages. This follows the profile of the topography surrounding the facility as receptors on this side of the facility are at a higher elevation in comparison to receptors due north of the facility. It must be noted that this wind direction would have a lower frequency and therefore this again lowers the risk of odour impacts in this direction. In addition, it should be noted that this facility is located in a light industrial estate with industry of a similar nature located close by. *Table 5.1* provides specific predicted odour levels at eight specific potential sensitive locations in the vicinity of the facility. As can be observed, the predicted odour levels are greater than 3.0 Ou_E/m^3 at the 98th percentile of hourly verges for the worst case meteorological year Cork 2004.

5.2. Odour plume dispersal for proposed Country Clean Recycling Ltd facility – ref Scenario 2

The plotted odour concentrations of ≤ 3.0 for the 98th percentile for Country Clean Recycling facility operations with Stage 1 odour mitigation implemented is illustrated in *Figure 8.3*. As can be observed, it is predicted that odour plume spread is reduced with a radial spread of up to 200 metres from the boundary of the facility for an odour concentration of less than or equal to 6.0 Ou_E/m^3 at the 98th percentile of hourly averages. This would again suggest the need for further mitigation to be implemented but it should be noted than this is an industrial estate and no residential receptors live within this area. It is suggested to the regulator given the location of the facility, the nature of the waste handling process and activities onsite, that Stage 2 mitigation is only implemented if odour complaints arise out of activity changes at the facility given that there are no recorded complaints about activities at the facility at present. In addition, it should be noted that this facility is located in a light industrial estate with industry of a similar nature located close by. *Table 5.1* provides specific predicted odour levels at eight specific potential sensitive locations in the vicinity of the facility. As can be observed, the predicted odour levels are greater than 3.0 Ou_E/m^3 at the 98th percentile of hourly verges for the worst case meteorological year Cork 2004.

5.3. Odour plume dispersal for proposed Country Clean Recycling Ltd facility – ref Scenario 3

The plotted odour concentrations of ≤ 3.0 for the 98th percentile for Country Clean Recycling facility operations with Stage 2 odour mitigation implemented is illustrated in *Figure 8.4*. As can be observed, it is predicted that odour plume spread is reduced further from Scenario 3 with a radial spread of up to 50 metres from the boundary of the facility for an odour concentration of less than or equal to 3.0 Ou_E/m^3 at the 98th percentile of hourly averages. Keeping in mind the Scenario 2 achieved approximately a 33% decrease in odour levels around the facility, that no registered complaints exist for the operating facility and those significant improvements in housekeeping will be

implemented, the need for Stage 3 implementation may be considered as a stop gap following the receipt of complaints or intensification at the facility. *Table 5.1* provides specific predicted odour levels at eight specific potential sensitive locations in the vicinity of the facility. As can be observed, the predicted odour levels are less than 3.0 Ou_E/m^3 at the 98th percentile of hourly verges for the worst case meteorological year Cork 2004.

Table 5.1. Predicted odour concentrations at eight sensitive receptor locations in the vicinity of Country Clean Recycling facility for Scenarios 1, 2 and 3.

Receptor identity (*see Figure 8.1*)	X coordinate (m)	Y coordinate (m)	Scenario 1 (Ou_E/m^3)	Scenario 2 (Ou_E/m^3)	Scenario 3 (Ou_E/m^3)
R1	166262.6	73619.1	18.39	6.43	1.28
R2	166286.6	73522.5	13.46	4.73	1.15
R3	166255.4	73529.3	19.47	6.83	1.47
R4	166235.9	73511.3	25.48	9.14	1.74
R5	166205.7	73522.7	42.12	14.66	2.60
R6	166193.3	73500.9	32.78	11.78	2.07
R7	166129.3	73473.1	22.97	9.88	1.68
R8	166035.4	73519	4.36	1.86	0.44

6. Conclusions

A worst-case odour emission scenario was modelled using the atmospheric dispersion model Aermod Prime with meteorology data representative of the study area. A worst-case odour emission data set was used to predict any potential odour impact in the vicinity of the proposed facility operations with and without the implementation of odour management, minimisation and mitigation protocols. It was concluded that:

1. The current site processes are operating in the absence of generated odour complaints from nearby industrial receptors and therefore requires no mitigation techniques to be installed. Good housekeeping techniques (such as keep yard area clean, ensure all wet waste is bulked and transferred within 24 hrs and closed door management, etc) should be improved and maintained on the site to ensure no generation of complaints.
2. With regard to Scenario 1 and 2, in accordance with odour impact criterion in *Table 2.2*, and in keeping with current recommended odour impact criterion in this country, a number of industrial residences in the vicinity of the proposed operations may perceive odour impact as a result of emissions from the new processes if odour mitigation is not implemented. No complaints pertaining to odours have been received by the facility and the facility is located in a light industrial estate with no residential receptors in close proximity.
3. With regards to Scenario 3, In accordance with odour impact criterion in *Table 2.2*, and in keeping with current recommended odour impact criterion in this country, no odour impact should be perceived by industrial neighbours in the vicinity of the facility if odour mitigation as detailed within the report is implemented into the facility design.
4. Management, operational and odour mitigation protocols will lead to a reduction in overall emissions of offensive odours and markedly reduce the odour impact area. It is predicted that no industrial neighbours will perceive odour impact following the implementation of these protocols. Those management and mitigation strategies discussed throughout this document should be considered and implemented to ensure no odour impact and best international practice should be maintain in the operation of the facility in terms of odour mitigation.

7. Recommendations

The following recommendations were developed during the study:

1. Maintain and improve good housekeeping practices (i.e. keep yard area clean, building floor and waste transfer activities indoors, clean roughly any residual solids from the building, etc.), closed-door management strategy and interlocked throughout the building in which this process is to be located (i.e. to eliminate puff odour emissions from the building).
2. Ensure separated organic material is stored within enclosed vessels / bays and removed off site within 24 hours of acceptable / generation.
3. Ensure MSW material is stored within a bay and removed off site within 24 hours of acceptable / generation. Any leachate generated should be drained to closed sumps and all spillage area cleaned up at end of working day.
4. For stage 1 implementation, interlock all doors, seal apex, eves, along concrete push wall, flashing on doors and at top of doors etc to improve building integrity.
5. An odour management plan and auditing procedure should be operated and maintained throughout facility operations.

8. *Appendix I* - Odour dispersion modelling contour results

8.1. Site layout

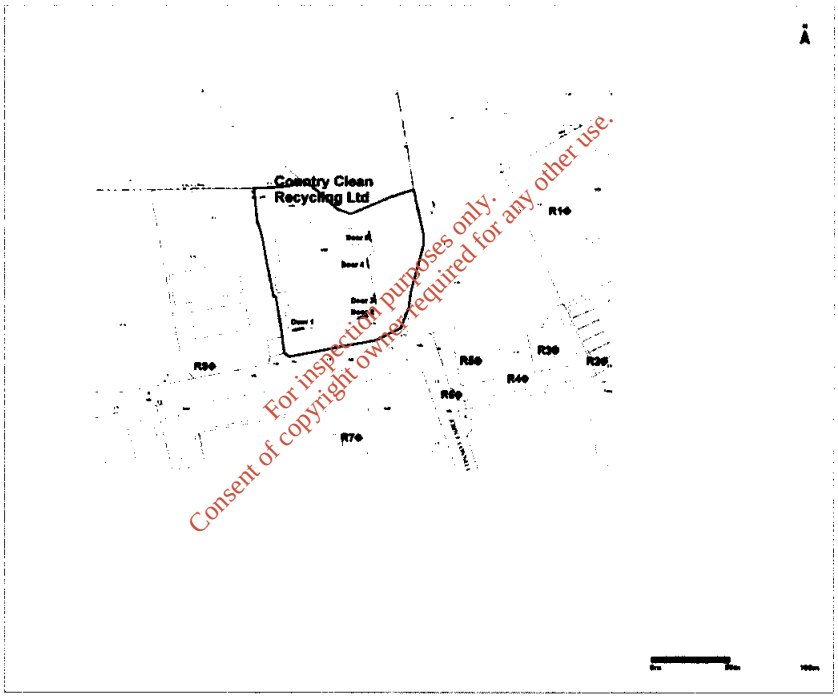

Figure 8.1. Aerial diagram of Country Clean Recycling facility and boundary (——).

8.2 Predicted odour emission contribution of existing Country Clean Recycling Ltd operations to odour plume dispersal at the 98th percentile for an odour concentration of ≤ 15 Ou_E m^3 (ref Scenario 1)

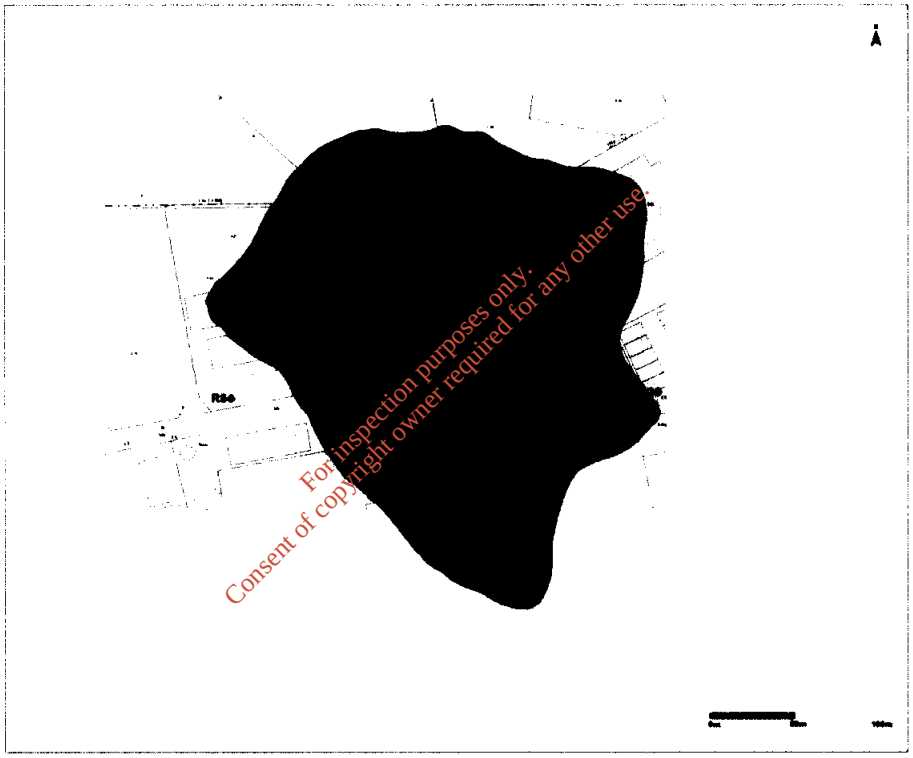

Figure 8.2. Predicted odour emission contribution of existing Country Clean Recycling Ltd facility operations without odour mitigation to odour plume dispersal for Scenario 1 at the 98th percentile for odour concentrations ≤ 15.0 Ou_E m^{-3} ( ).

8.3 Predicted odour emission contribution of proposed Country Clean Recycling facility operations with odour mitigation implemented respectively to odour plume dispersal at the 98th percentile for an odour concentration of ≤6.0 Ou_E m^3 (ref Scenario 2).

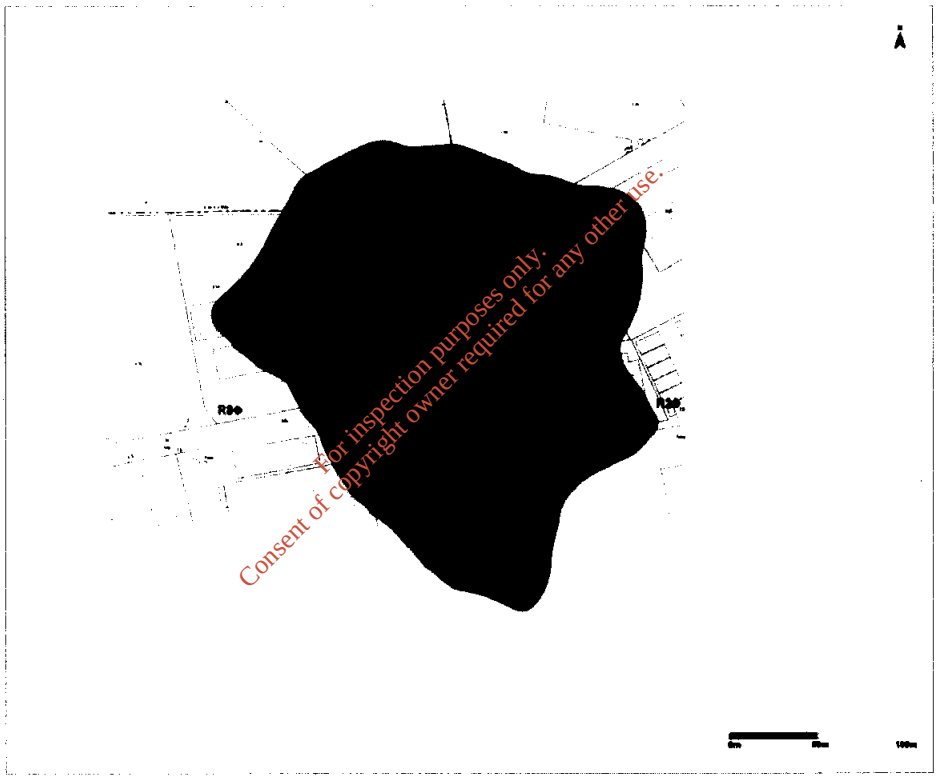

Figure 8.3. Predicted odour emission contribution of Country Clean Recycling facility operations with odour mitigation to odour plume dispersal for Scenario 2 at the 98th percentile for odour concentrations ≤ 6.0 Ou_E m^{-3} (▬).

8.4 Predicted odour emission contribution of proposed Country Clean Recycling facility operations with further odour mitigation implemented respectively to odour plume dispersal at the 98th percentile for an odour concentration of ≤3.0 Ou_E m^3 (ref Scenario 3).

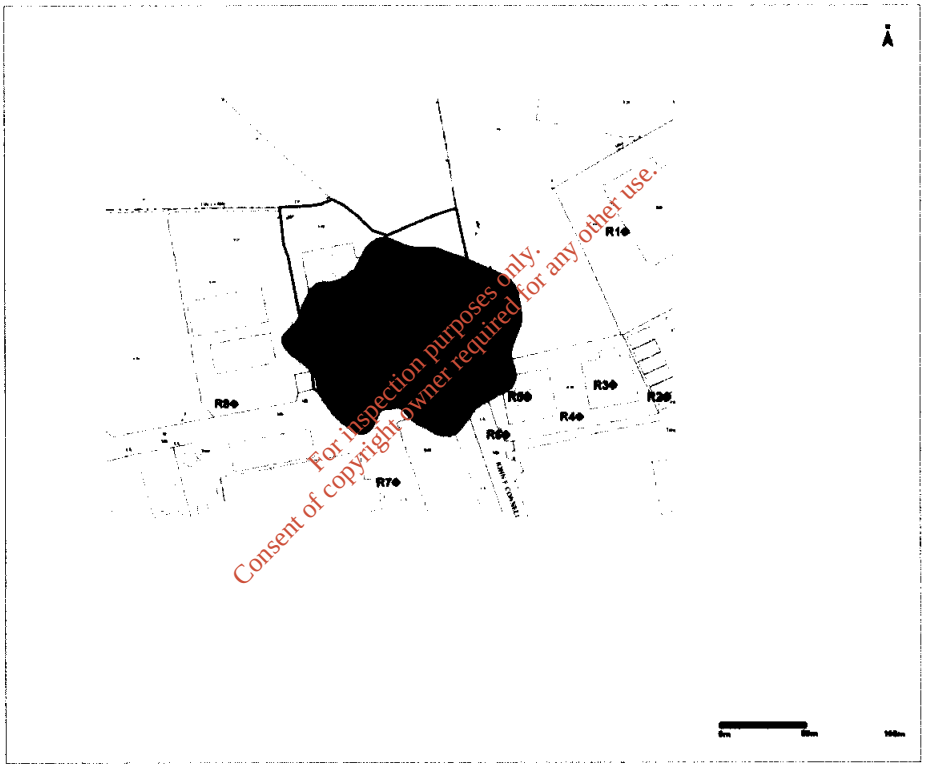

Figure 8.4. Predicted odour emission contribution of proposed Country Clean Recycling Ltd facility operations with odour mitigation to odour plume dispersal for Scenario 3 at the 98th percentile for odour concentrations ≤ 3.0 Ou_E m^{-3} ( ).

9. *Appendix II* – Odour Management plan overview.

9.1. Odour management plan - – Standard practice

The Odour Management Plan (OMP) is a core document that is intended to detail operational and control measures appropriate to management and control of odour at the site. The format of the OMP should provide sufficient detail to allow operators and maintenance staff to clearly understand the operational procedures for both normal and abnormal conditions.

An Odour Management Plan (OMP) should be prepared for all processes. The OMP should also include sufficient feedback data to allow site management (and local authority inspectors) to audit site operations. An example of some of the issues to be considered is summarised as follows. More detailed guidance is provided with this document.

- A summary of the site and waste, odour sources and the location of receptors,
- Details of the site management responsibilities and procedures for reporting faults, Identifying maintenance needs, replenishing consumables, complaints procedure,
- Odour critical plant operation and management procedures (e.g. correct use of plant, process, materials; checks on equipment performance, maintenance and inspection,
- Operative training,
- Housekeeping,
- Maintenance and inspection of plant (both routine and emergency response),
- Spillage and house keeping management procedures,
- Record keeping – format, responsibility for completion and location of records,
- Emergency breakdown and incident response planning including responsibilities and mechanisms for liaison with the local authority.
- Public relations.

The Odour Management Plan is a living document and should be regularly reviewed and upgraded. It should form the basis of a document Environmental and Odour Management system for the operating site. The Odour Management System documentation should define the roles of the Plant Operator and staff and sets out templates in relation to the operating of the facility and reporting procedures to be employed. Requirements for the Odour management plan should be implemented thought out the site with a branched management system implemented in order to share responsibility around the site. The head manager should ensure all works are performed in accordance with the OMP. The OMP should be integrated in the overall Environmental Management System/Performance management system.

10. References

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6. Longhurst, P., (1998). Odour impact assessment of an extension to the Brogborough landfill site. IREC, Cranfield University, England.
7. McIntyre, A., (2000). Application of dispersion modelling to odour assessment; a practical tool or a complex trap. Water Science and Technology, 41 (6). 81-88.
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9. Sheridan, B.A., (2001). Controlling atmospheric emissions-BAT Note Development, UCD Environmental Engineering Group, Department of Agricultural and Food Engineering, UCD, Dublin 2.
10. Sheridan, B.A., Hayes, E.T., Curran, T.P., Dodd, V.A., (2003). A dispersion modelling approach to determining the odour impact of intensive pig production units in Ireland. Bioresource Technology. Published.

11. *Appendix III* - Meteorological data examined and used in the dispersion modelling exercise

Table 11.1. Tabular illustration of Cork meteorological files for Years 2003 to 2007 inclusive (5 years).

5 year Meteorological file for Cork 2003 to 2007 inclusive							
Dir \ Speed	**<= 1.54 m/s**	**<= 3.09 m/s**	**<= 5.14 m/s**	**<= 8.23 m/s**	**<= 10.80 m/s**	**> 10.80 m/s**	**12. Total**
0.0	0.18	0.31	1.68	1.03	0.26	0.01	3.48
22.5	0.18	0.22	1.44	0.78	0.12	0.00	2.75
45.0	0.12	0.17	0.83	0.46	0.05	0.00	1.64
67.5	0.20	0.41	1.09	0.55	0.18	0.00	2.45
90.0	0.28	0.53	1.58	0.89	0.15	0.03	3.45
112.5	0.28	0.76	2.33	1.38	0.30	0.10	5.15
135.0	0.20	0.52	1.81	0.96	0.26	0.15	3.89
157.5	0.34	0.69	2.36	1.50	0.51	0.16	5.57
180.0	0.51	0.95	2.69	1.38	0.49	0.08	6.10
202.5	0.60	1.18	3.88	2.56	1.22	0.37	9.83
225.0	0.42	0.83	5.19	3.28	1.17	0.45	11.33
247.5	0.37	0.89	5.40	2.70	0.70	0.22	10.28
270.0	0.35	0.81	2.68	1.72	0.47	0.12	6.15
292.5	0.40	1.16	4.04	2.05	0.68	0.18	8.50
315.0	0.33	1.00	4.32	2.00	0.53	0.11	8.29
337.5	0.38	0.99	5.69	2.48	0.39	0.05	9.98
Total	**5.13**	**11.42**	**47.02**	**25.73**	**7.47**	**2.05**	**98.82**
Calms	-	-	-	-	-	-	**0.93**
Missing	-	-	-	-	-	-	**0.24**
Total	-	-	-	-	-	-	**100.00**

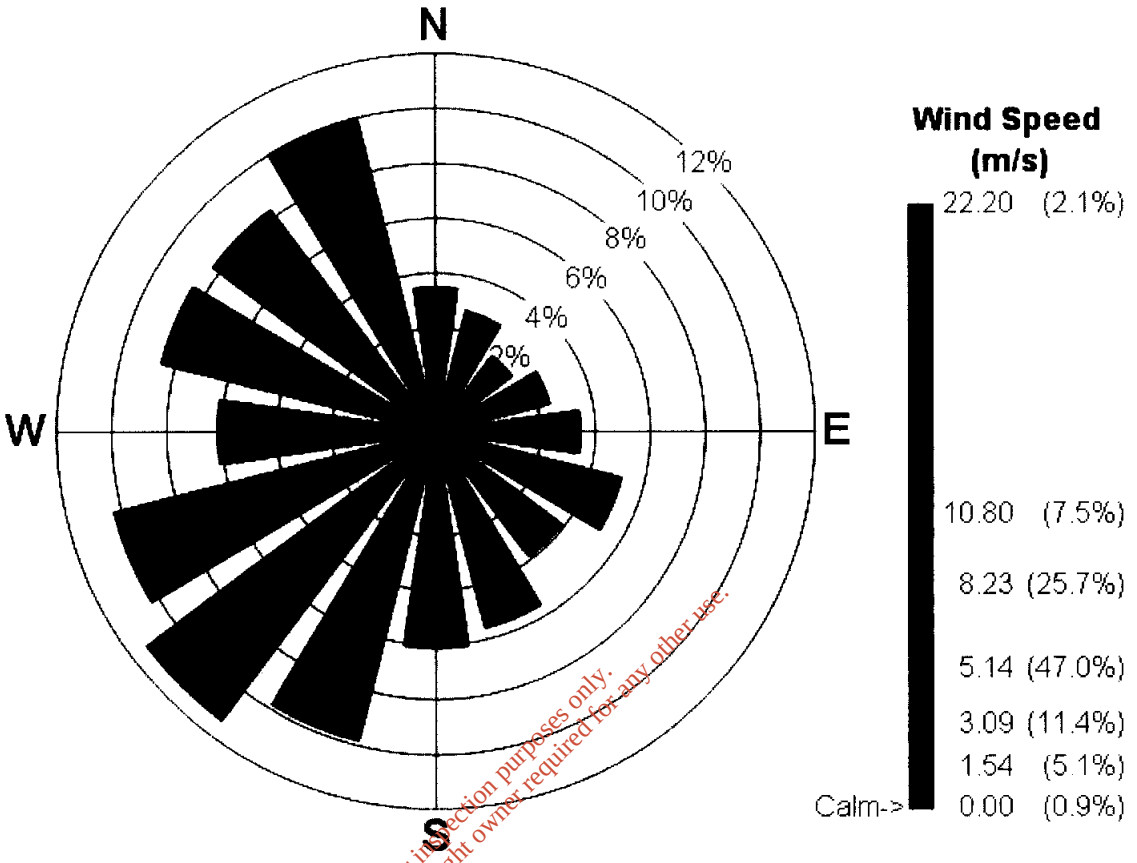

Figure 11.1. Windrose illustration of meteorological files Cork 2003 to 2007 inclusive.

Appendix F

ARACHAS
The Irish for Insurance

Certificate of Insurance

Name	Country Clean Recycling Ltd.,
Address	The Mill Castletownroche, Co. Cork
Business Description	Waste Collection, Recycling & Mini Skips
Period of Cover	**From** 18/06/2011 **To** 18/06/2012
Renewal Date	18/06/2011
Insurer	Zurich Insurance Ireland
Policy Number	07 CCP 1277002
Employers Liability Indemnity Limit	€ 13,000,000 any one event
Public Liability Indemnity Limit	€ 6,500,000 any one event
Product Liability Indemnity Limit	€ 6,500,000 any one event and aggregate in the period

Terms

- Standard Policy Terms, Exceptions and Conditions
- Indemnity to Principals
-
- The policy has been extended to note the indemnity to
- Cork City Council of the placement of skips at various locations in Cork City.
  The policy has been extended to note indemnity to Cork
- County Council
  The policy has been extended to note indemnity to Kilkenny County Council and Cork County Council

Date of Authentication **28 June 2011**

Authorised Signature

Managing Director
Arachas
e-mail: insure@arachas.ie

Bank of Ireland

Mallow, Co. Cork
Tel +353 (0)22 21535 / 21543 / 51546
Fax +353 (0)22 42115
www.bankofireland.ie

17th May 2011.

To Whom it May Concern

Re: Country Clean Recycling Ltd

The following information is given in strict confidence for your private use only, and without responsibility on the part of this Bank or the writer and, where the information has been obtained from another bank or informant, without responsibility on the part of themselves or their officials.

Country Clean Recycling Ltd are longstanding customers of BOI. They have a strong financial profile and operate their account in a satisfactory manner at all times.

They are highly respectable and trustworthy and would not undertake a commitment they could not fulfil.

Bank of Ireland
BUSINESS BANKING
17 MAY 2011
MALLOW

Appendix G

Appendix H

Attachment D.2

Facility Operation

Country Clean Recycling Ltd
Churchfield Industrial Estate, John F. Connolly Rd., Cork
Waste Licence Application
Rev 0 01.10.2011

Attachment D.2 Facility Operation

Attachment D.2 contains details of how the site operates.

The Waste Licence Application relates to a proposed waste tonnage of 100,000 per annum to the current facility. Currently there is no waste limit specified within the Waste Permit from Cork City Council.

The following non-hazardous waste types are indicative of the current level of tonnage to be accepted at the site.

Household and Commercial Waste++	**18,200**
Dry recyclable waste**	**6,250**
Construction and Demolition Waste++	**15,600**
Mixed Municipal Waste**	**19,200**
Proposed Annual Permitted Waste Intake	**52,000**

**Refuse Truck Collection from Commercial & Households.
++ From Skip collections.

The following non-hazardous waste types are indicative of the proposed level of tonnage to be accepted at the site.

Household and Commercial Waste	**10,000**
Dry recyclable waste	**22,000**
Construction and Demolition Waste	**13,000**
Mixed Municipal Waste	**55,000**
Proposed Annual Permitted Waste Intake	**100,000**

It is proposed to increase the total annual intake to 100,000 tonnes per annum. As part of the site operation it is proposed to install a new sorting line for construction and demolition material. An illustration of waste processing activities undertaken at the site is illustrated in Figure D.2.1a-c.

Municipal Waste
Municipal waste which is received from both household and commercial inputs is tipped into the municipal waste storage bay within the building (Storage Bay B) and the material is visually inspected to ensure there is no contamination or hazardous material present. The material is transported off site to licensed disposal facilities within a turn around time of 24 hours.

It is planned to mechanically treat this Mixed Municipal Waste on site by the end of 2011. Such treatment will be in line with the EPA's guidance document "Municipal Solid Waste - Pre-treatment & Residuals Management - An EPA Technical Guidance document". Two possible treatments processes are outlined in Figure D.2.1d (Waste Process 6 & 7). The location of the shredder, screener, the round baler and wrapper to be used in these processes is indicated in Drawing No.10 "Process Layout". The Magnetic Separator, Eddy Current Separator, Ballistics Separator, and Optical Separator detailed in waste process 7 are not present on site as of August 2011.

Mixed Dry Recyclable Material
Recyclable Material (mixed paper, cardboard, glass, metal, tetrapak) require very little sorting onsite. They are initially inspected onsite to ensure there is no contamination or hazardous material present. Any hazardous material is removed and placed in the quarantine area. The dry recyclables are then sorted onsite in storage bay B (see drawing No. 7 Waste Process Layout).

Cardboard
Cardboard is collected from commercial premises and separated out mixed skip waste in from waste process 1 (see details below) , it is stored inside the building in a designated storage bay and once a sufficient quantity is generated it is then transported baled on site and transported aboard for recovery by registered waste brokers. See Flow diagram in Figure D.2.1c, waste process 5.

Wood
Wood is stored onsite and in a designated area and once a sufficient quantity is generated, it is then shredded and transported to a licensed recovery facility. See Flow diagram in Figure D.2.1c, waste process 3.

Glass
Mixed packaging glass is collected from commercial and household premises, it is stored in designated storage bays according to glass type i.e. mixed packaging glass (EWC code 15 01 07), plate glass vehicle glass (EWC Code 16 01 20) or plate glass (EWC code 20 02 01) and once a sufficient quantity is generated it is then transported to a licensed recovery facility.

Kitchen Canteen Food Waste
Food waste which is received from both household and commercial inputs is tipped into specific enclosed food waste skip within the building and the material is visually inspected to ensure there is no contamination or hazardous material present. The material is transported off site to licensed disposal facilities within a turn around time of 48 hours.

Construction Demolition, Bulky and Commercial Skip Waste
This generally comprises rubble, recyclable material and bulky waste brought on site on skips and from other licensed waste collectors. Commercial and C&D waste is initially inspected onsite to ensure there is no contamination or hazardous material present. Any hazardous material is removed and placed in the quarantine area. The waste is then manually sorted and then is mechanically processed. This is described as waste process 1 and is outlined in the process description table and flow diagrams below (TableD.2.1 & Figure D.2.1a-c and Drawing No.7 Waste Process Layout).

The existing process shed drains to a holding tank and subsequently flows through an oil interceptor and to sewer. Storage bays are located within the facility which stores the relevant material until sufficient quantities are generated to be transported to a material recovery facility.

Mixed Waste from Picking Line (Waste Process 1)
Mixed Waste from the waste processing line (waste process 1) that is unsuitable for recycling is baled on site as per waste process 2 (see Figure D.2.1c) and transported off to a material recovery facility.

Table D.2.1 Description of Waste Process of Construction Demolition, Bulky and Commercial Skip Waste – Waste Process 1

A	WASTE LINE A			
A.1	Waste on Site	Skip Waste On Site (I.e. Mixed Commercial Waste Mixed C&D)	1) Skip Trucks	
A.2	Scalping	Waste is Mechanically and Manually separated, to removed bulky material that may block line, timber pallets, mattresses	2) Manual Handling 3) Excavator 4) Skid Steer	· Bulky Mixed Waste e.g. Mattresses · Large Timber · Timber Pallets · Oversized Metal · Plasterboard · Fugitive material/Hazardous waste, WEEE goods.
A.3	Feeding Hopper	Scalped Waste is Feed into Hopper by Excavator or loader.	1) Loader or 2) Excavator	N/A
A.4	Inclined Conveyor Belt	Waste Passing through an inclined belt that travels fast to separate out waste leaving hopper.	Conveyor Belt	N/A
A.5	102mm Finger Screening	Waste passes into 102mm Finger Screen. Two our puts **1).** Waste over 102mm passed over screen onto picking line via conveyor **2).** Waste material below 102mm passing down into hopper under screen.	Finger Screen	N/A

B	Waste Line B (Post Finger Screen Waste >250mm)			
B.1	Picking Line	Via Conveyor material passes onto picking line, where waste material is picked off and placed in to sorting bays.	5 M Picking Line	· Timber · Mixed Metal · Cardboard · Rubble (+250mm) · Cable · Copper · Mixed Waste (Unsuitable material for recycling 70% Plastic) **
C	Waste Line C (Post Finger Screen Waste < 250mm)			
C.1	Less than 250mm Waste Passes into Hopper	Waste from hopper moves via conveyor into Trommel	Conveyor belts	N/A
C.2	Screening 50mm	Waste through 5m Trommel to separate waste into + -50mm waste stream	50mm Trommel	N/A
D	Waste Line D (Post Trommel Waste > 50mm)			
D.1	10m Picking Line	+ 50mm waste from Trommel passes onto 10m long picking line. Waste Separated	10 M Picking Line	· Mixed Metals · Cable · Copper · Timber · Mixed Waste (Unsuitable material for recycling ~70% Plastics)**
D.2	Metal Removal	Magnet at the end of 10m picking line removes ferrous metals	Over band Magnet	· Mixed Ferrous Metals

D.3	Blower	Blower at the end of the picking line removes any light material mainly plastics, paper & Aero board	Blower	· Mixed Waste**
D.4	Pre Stone Crusher Picking Line	Remaining Masonry and rubble waste passes along conveyor through a 1m picking line to remove any remaining non rubble material	1 m picking line	· Mixed Waste**
D.5	Masonry Crusher	Rubble passes through stone crusher to crush rubble	Masonry Jaw Crusher	· Crushed Masonry/Rubble (Between 50mm to 102 mm)
E	Waste Line E (Post Trommel Waste < 50mm)			
E.1	Feeder Conveyor	- 50mm waste from Trommel falls onto Flip Flop feeder conveyor	Flip Flop Feeder Conveyor	N/A
E.2	Ferrous Metal Removal	As material is conveyed on the Flip Flop feeder conveyor it passes beneath an overband magnet that removes any ferrous metals into a designated bin.	Over band Magnet	Mixed Ferrous metals
E.3	Flip Flop	The Flip Flop contains a 15mm screen for screening fines. The fines (<15mm) pass onto a conveyor	Flip Flop	
E.4	Fines to Storage Bay	The +15mm fines are deposited beneath the Flip Flop onto the Fines Collection Conveyor, (which is reversible), Fines is sorted into a designated storage bay.	Fines Collection Conveyor	<15mm Fines

E.5	Sucker & Blower	The > 15mm material from the Flip Flop is conveyed from the Flip Flop on the Flip Flop discharge Conveyor, A 7.5Kw blower blows light material up towards the 11Kw blower/sucker which sucks the light material and deposited them in a designated storage bay for stock piling. The remaining material Rubble (15mm-50mm) is deposited in a designated storage bay	7.5Kw Blower	· 15mm-50mm rubble
			11Kw Blower/sucker	· Mixed Waste**
F	Waste Line F (Processing of 15mm-50mm rubble - Post Flip-Flop)			
F.1	Wind Shifter	Wind shifter sorts waste based on passing waste through an air stream. Light mixed waste is blown on for further processing. Heavy waste falls onto picking line.	Wind Shifter	· Mixed Waste** · Rubble (Heavy Waste)
F.1	Picking Line 3	Rubble type waste falls onto picking line, where non rubble material is removed, from the waste stream.	Picking Line 3	· Timber · Mixed Metal · Mixed Waste** · Clean Rubble
G	Waste Line G (Processing of 50mm-250mm rubble - Post Picking Line 2)			
G.1	Trommeling	30 mm Trommel grades rubble waste.	30 mm Trommel	· + 30 mm Rubble · - 30 mm Rubble
G.2	Cleaning <30mm waste	<30mm waste passed through Turbo Screener, which cleans waste using screens and air streams	Turbo Screener	· Silt · Mixed Waste** · Clean Rubble

G.3	Wind Shifter sorting + 30mm rubble	+ 30mm rubble waste passes through wind shifter sorts waste using an air stream. Light mixed waste is blown on for further processing. Heavy rubble waste falls onto picking line 3.	Wind Shifter	· Mixed Waste** (light Waste) · Rubble (Heavy Waste)
G.4	Picking Line 3	Rubble type waste falls onto picking line, where non rubble material is removed, from the waste stream.	Picking Line 3	· Timber · Mixed Metal · Mixed Waste** · Clean Rubble

** This Waste is Not suitable for recycling and is passed through a shredder and bales and send for disposal
Process Description Updated 01.Oct.2011 Rev 0

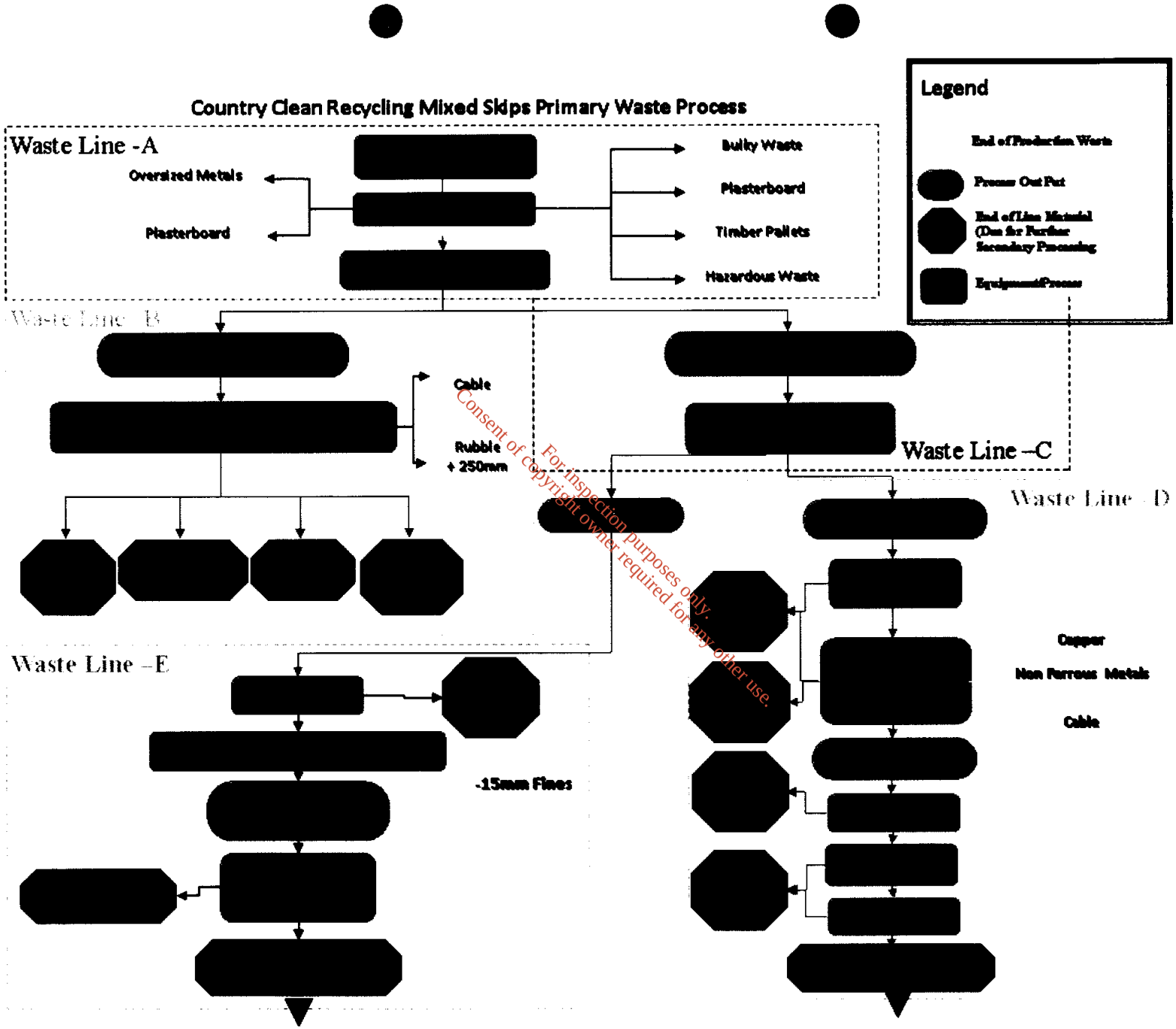

Figure D.2.1.a Waste Process 1 Description

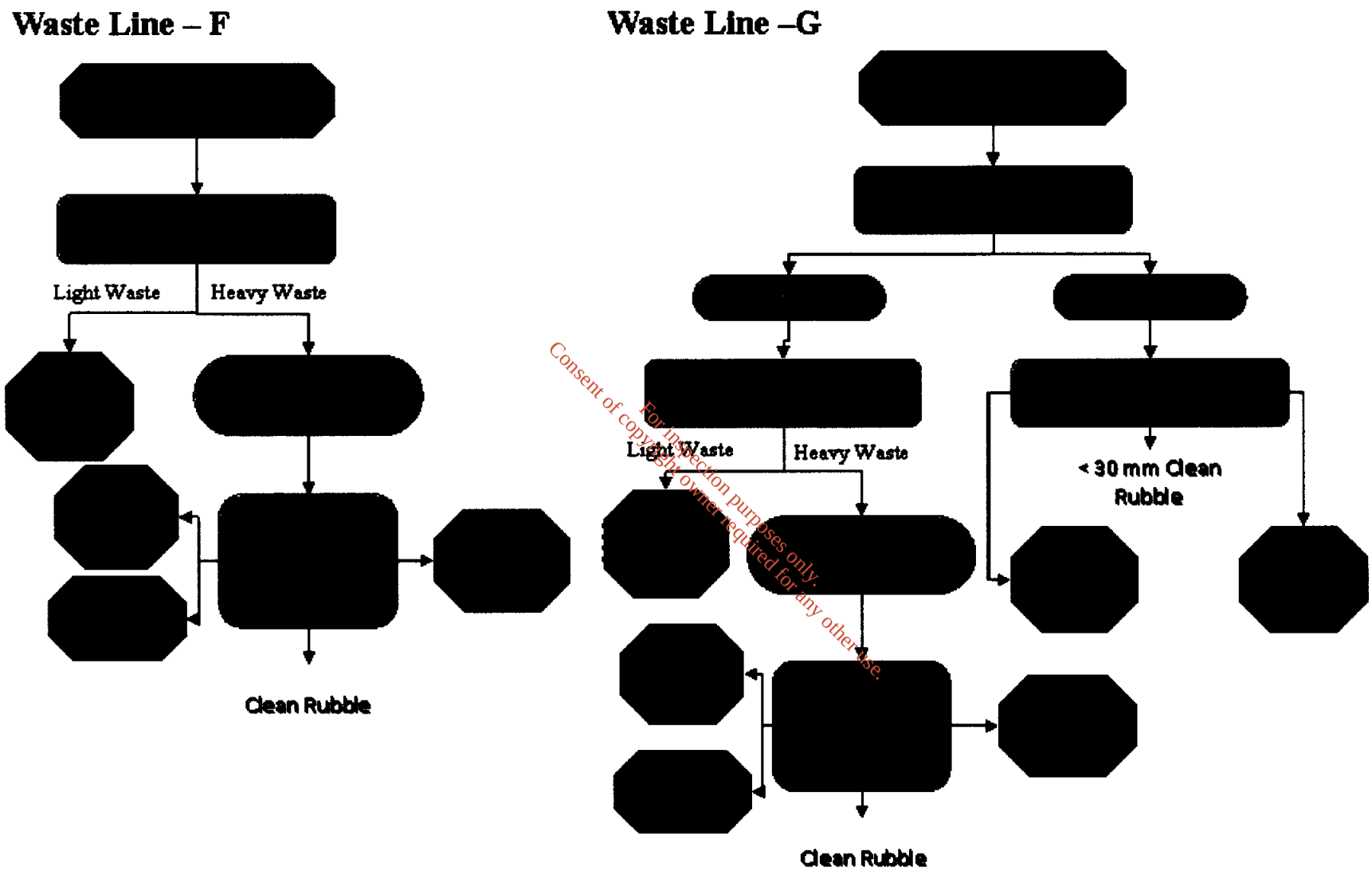

Figure D.2.1.b Waste Process 1 Description

Secondary Waste Treatment after Initial Waste Process

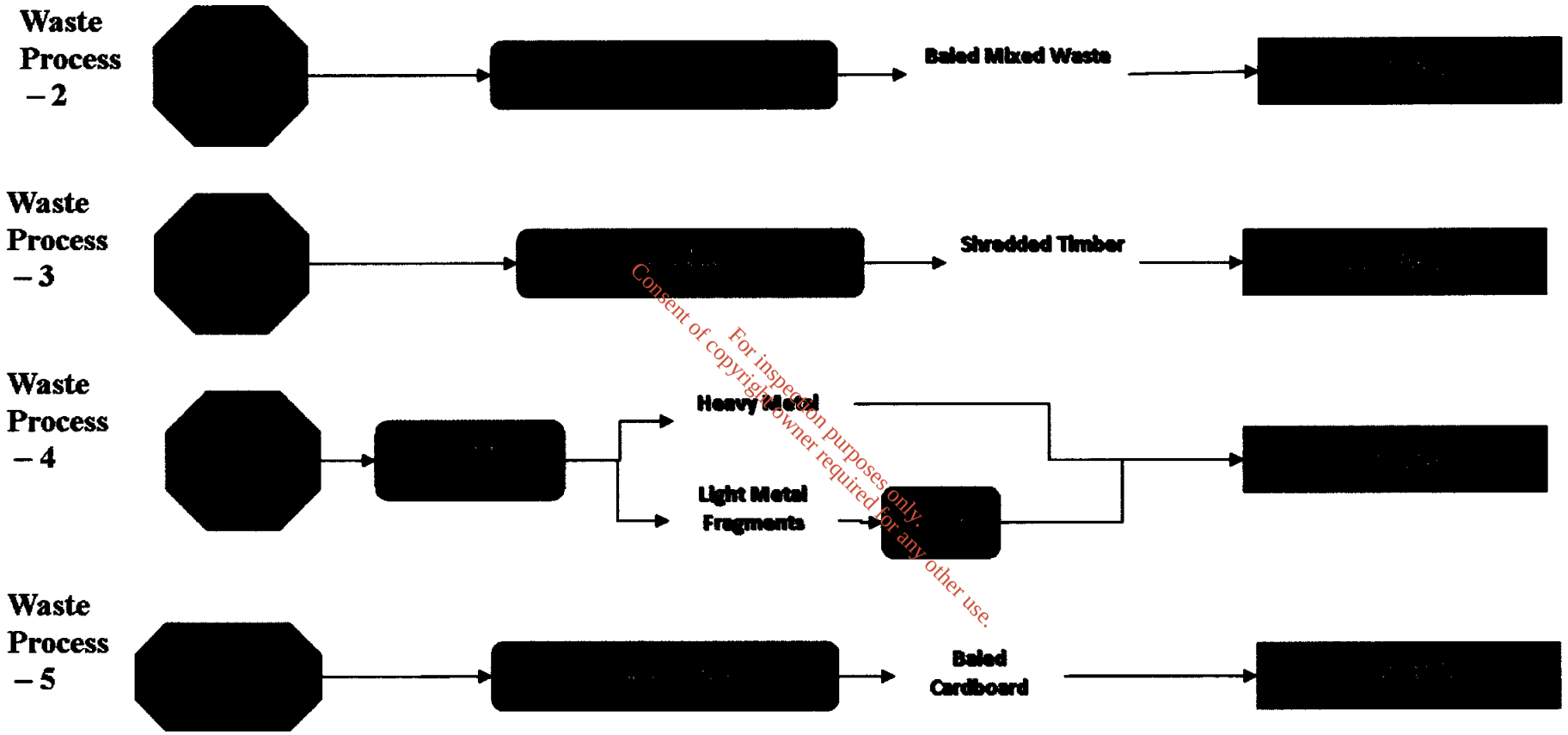

Figure D.2.1.c Waste Processing Description

Treatment of Mixed Municipal Waste

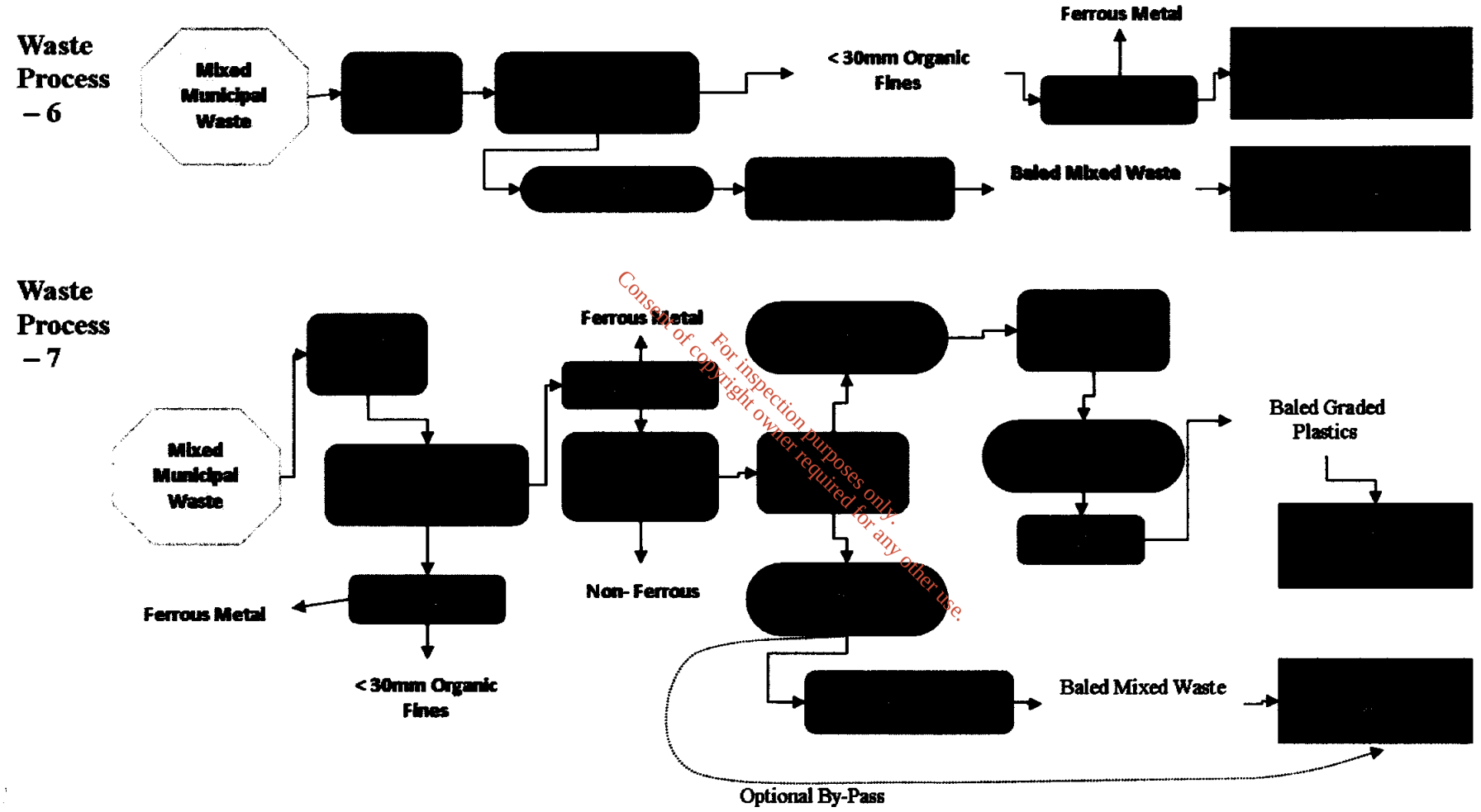

Figure D.2.1.d Waste Processing Description (Proposed for Mixed Municipal Waste Treatment)

Appendix I

TABLE H.4(ii) WASTE - Other Waste Recovery/Disposal

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
Plastic packaging	15 01 02	Municipal sources	1			Baled and Sorted for reprocessing; Leinster Environmental Ltd, Claremont Bus Pk Haggardstown Dundalk Co. Louth WP 2004/30	
Wood	15 01 03	Construction and Demolition	80			Used as Raw material Eirebloc Ltd, Marcoom Co.Cork CK (S) 503/07. Used as livestock Bedding Greenline Services, Castletownroche, Co.Cork	
Metallic packaging	15 01 04	Municipal sources	5			Sorted, Graded and sold for reprocessing; Cork Metal Dublin Hill, Cork WP 08/01	
Glass packaging	15 01 07	Municipal sources	70			Glass Crushed and sold for reprocessing Glassco Recycling Ltd, Caragh Road, Naas, Co. Kildare, WP 247/2006.	
Other WEEE	16 02 14 / 20 01 36	Municipal sources	0.01			E-Waste Xperts Limited Unit 5 South Cork Industrial Estate, Vicars Road, Cork WP 01/08	
Glass End of Life Vehicles	16 01 20	Commercial (Car Repairs)	4			Glass Crushed and sold for reprocessing Glassco Recycling Ltd, Caragh Road, Naas,	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
						Co. Kildare, WP 247/2006.	
Tyres	16 01 03	Construction and Demolition	1.80			Shreeded and used as product, Crossmore Transport Ltd, Kildorrey, Co.Cork CK (N) 523/08.	
Lead batteries	16 06 01*	Municipal sources	1.0*			Crushed and recyclable fraction recycled and remainder disposed. Rilta Environmental Ltd, Block 402, Grant's Drive Greenogue Buiness Park, Rathcoole, County Dublin WO192-03	
mixture of concrete, bricks, tiles and ceramics	17 01 07	Construction and Demolition	50.00			Landbanking, Mallow Contracts, Burnfort, Mallow Co.Cork, CK (N) 277/05	
Wood	17 02 01	Construction and Demolition	95			Used as Raw material Eirebloc Ltd, Marcoom Co.Cork CK (S) 503/07. Used as livestock Bedding Greenline Services, Castletownroche, Co.Cork	
Glass	17 02 02	Construction and Demolition	16.8			Glass Crushed and sold for reprocessing Glassco Recycling Ltd, Caragh Road, Naas, Co. Kildare, WP 247/2006.	
Plastic	17 02 03	Construction	8.10			Baled and Sorted for	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
		and Demolition				reprocessing Leinster Environmental Ltd, Claremont Bus Pk Haggardstown Dundalk Co. Louth WP 2004/30	
Copper, brass, bronze	17 04 01	Construction and Demolition	0.08			Sorted, Graded and sold for reprocessing; National Recycling, John F Connolly Road, WP 01-10	
Aluminium	17 04 02	Construction and Demolition	2.8.			Sorted, Graded and sold for reprocessing; National Recycling, John F Connolly Road, Churchfield Cork WP 01-10	
Lead	17 04 03	Construction and Demolition	0.05			Sorted, Graded and sold for reprocessing; National Recycling, John F Connolly Road, Churchfield, Cork WP 01-10	
Zinc	17 04 04	Construction and Demolition	0.01			Sorted, Graded and sold for reprocessing; National Recycling, John F Connolly Road, Churchfield Cork WP 01-10	
Iron & Steel	17 04 05	Construction and Demolition	35			Sorted, Graded and sold for reprocessing; Cork Metal Dublin Hill, Cork WP 08/01	
Mixed metals	17 04 07	Construction and Demolition	94			Sorted, Graded and sold for reprocessing; Cork Metal Dublin Hill, Cork WP 08/01	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
Cables from construction and demolition waste not containing dangerous substances	17 04 11	Construction and Demolition	2.75			Sorted, Graded and sold for reprocessing; National Recycling, John F Connolly Road, WP 01-10	
Soil & Stone	17 05 04	Construction and Demolition	1987.9			Landbanking, Mallow Contracts, Burnfort, Mallow Co.Cork, CK (N) 277/05	
Plasterboard gypsum-based construction materials	17 08 02	Construction and Demolition	5.00			Crushed Sorted & Recycled; Nurendale Ltd T/A Panda Waste Services, Cappagh Road Order, Cappoge Finglas Dublin 11 Permit Ref: WPT 95,	
Mxed construction and demolition wastes (Non-Hazardous)	17 09 04	Construction and Demolition	5			Further Processing into recyclable fractions; KWD Recycling Aughacurreen, Killarney, Co.Kerry, WO 217-01	
Glass	19 12 05	Permitted/Licensed Waste Facilities	1			Glass Crushed and sold for reprocessing Glassco Recycling Ltd, Caragh Road, Naas, Co. Kildare, WP 247/2006.	
Wood (Non Hazardous)	19 12 07	Permitted/Licensed Waste Facilities	1			Used as Raw material Eirebloc Ltd, Marcoom Co.Cork CK (S) 503/07.	
Mechanically Treated Waste	19 12 12	Permitted/Licensed Waste	60			Further Processing into recyclable	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2]	Off-site Recovery, reuse or recycling	Off-site Disposal
			Tonnes / month	m^3 / month	(Method & Location)	(Method, Location & Undertaker)	(Method, Location & Undertaker)
		Facilities				fractions; KWD Recycling Aughacurreen, Killarney, Co.Kerry, WO 217-01	
Cardboard packaging & paper packaging	15 01 01 20 01 01	Municipal sources	90			Brokered by Marwin Environmental Trading Ltd, Bishopstown, Co.Cork & Irish Packaging Recycling Ltd, Ballmount Road, Walkinstown Dublin, & Parry & Evans Ltd (UK), Severn Farm Industrial Estate, WelshpoolPowysSY21 7DF, UK	
Glass	20 01 02	Municipal sources	10			Glass Crushed and sold for reprocessing Glassco Recycling Ltd, Caragh Road, Naas, Co. Kildare, WP 247/2006.	
Biodegradable kitchen and canteen waste	20 01 08	Municipal sources	28			Composting. Acorn Composting Facility, Ballybeg, Littleton, Co Tipperary WO249-01	
Clothes	20 01 10	Municipal sources	1			Graded and sold for re-use. Textile Recycling Ltd - Glen Abbey Complex, Belgard Road, Tallaght, Dublin 24	
Textiles	20 01 11	Municipal sources	0.01			Graded and sold for re-use. Textile Recycling Ltd - Glen Abbey Complex,	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
						Belgard Road, Tallaght, Dublin 24	
Discarded electrical and electronic Equipment	20 01 35*	Municipal sources	0.01			E Waste Xperts Limited Unit 5 South Cork Industrial Estate, Vicars Road, Cork WP 01/08	
Wood (Non Hazardous)	20 01 38	Municipal sources	5			Used as Raw material Eirebloc Ltd, Marcoom Co.Cork CK (S) 503/07	
Plastic from municipal sources	20 01 39	Municipal sources	0.30			Baled and Sorted for reprocessing; Leinster Environmental Ltd, Claremont Bus Pk Haggardstown Dundalk Co. Louth WP 2004/30	
Metals	20 01 40	Municipal sources	5			Sorted, Graded and sold for reprocessing; Cork Metal Dublin Hill, Cork WP 08/01	
Biodegradable Waste	20 02 01	Municipal sources	2			Composting. Acorn Composting Facility, Ballybeg, Littleton, Co Tipperary WO249-01	
Soil & Stone	20 02 02	Municipal sources	1			Further Processing into recyclable fractions; KWD Recycling Aughacurreen, Killarney, Co.Kerry, WO 217-01	
Mixed Dry Recyclables	20 03 01	Municipal sources	1,600			Recyclables fraction separated and baled	

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
						and sent abroad for recycling; Killarney Waste Disposal Aughacureen,Killarney Co. Kerry WO 217-01	
Mixed Municipal Waste	20 03 01	Municipal sources	3,700				Landfilled Limerick County Council Landfill, Gortnadroma. Co.Limerick, WO 017-02
Bulky Waste	20 03 07	Municipal sources	260				Landfilled Limerick County Council Landfill, Gortnadroma. Co.Limerick, WO 017-02

1 A reference should be made to the main activity/ process for each waste.
2 The method of disposal or recovery should be clearly described and referenced to Attachment H.1

Appendix J

Table G.1 Details of Process Related Raw Materials, Intermediates, Products

Table G.1 Details of Process related Raw Materials, Intermediates, Products, etc., used or generated on the site

Ref. Nº or Code	Material/ Substance[1]	CAS Number	Danger[2] Category	Amount Stored (tonnes)	Annual Usage (tonnes)	Nature of Use	R[3] - Phrase	S[3] - Phrase
	Water	--	Non Hazardous	-	2,005 M^3	Cleaning, & Sanitary	--	--
	Odour Neutraliser	----	Non Hazardous	300 L(25Lx12)	1,200 L	Odour Suppression	--	--
	Hydraulic Oil – Blend of highly refined mineral oil and additives	--	Non Hazardous	400 L	780 L	Hydraulic Oil for Trucks	R36/38	- -
	Engine Oil – Zinc DITHIOPHOSPHATE	68649-42-3	Flammable	275 L	3,650 L	Engine Oil	R38, R41, R51/53	--
	White Motor Diesel	64741-43-1	Harmful	4,000L	176,810 L	Fuel for Trucks	R18, R20, R21, R22, R51/53	S16, S23, S24, S43, S45, S61, S62
	Green Diesel Oil**	64741-43-1	Harmful	4,000L	145,200 L	Fuel for Onsite machinery &. Generators	R18, R20, R21, R22, R51/53	S16, S23, S24, S43, S45, S61, S62
	Paint. Fast Drying Primer		Irritant, Flammable,	90Kg	220 KG	Painting Skip	R10	S46,

	(Selemix System – PROPLYBENZENE – CUMENE – MESITYLENE – XYLENE – 1:2:4-TRIMETHYLBENZENE – ISOBUTYL-ALCOHOL – Solvent NAPHTHA – N-Butyl-ACETATE	03-65-1 98-82-8 08-67-8 1330-20-7 95-63-6 78-83-1 64742-95-6 123-86-4					R20/21 R36/37/38 R41 R51/53 R65 R66 R67, R52/53,	S23, S26, S38, S57
	Coolant	--	Harmful	100 L	200 L		R22	S2,S13, S46, S56, S24/25
	Degreasing Solvent	Xi	- -	50 L	150 L	Machine Maintenance	R36 R38	S2, S24/25. S26
	Multipurpose Grease	--	Harmful	20 Kg	780 Kg	Lubrication of Machinery	R40	S24
	Satin Black Aerosol Spray – Butyl Acetate – Butanone – Acetone – 1-METHOXY-2-PROPANOL – Butane – Propane	123-86-4 78-93-3 67-64-1 107-98-2 106-97-7 74-98-6	Flammable, Irritant	20 Litres	98 Litres	Paint for Skips	R12, R36, R66, R67	S2, S9, S16, S23, S26, S37, S51, S60

Notes: 1. In cases where a material comprises a number of distinct and available dangerous substances, please give details for each component substance.

2. c.f. Article 2(2) of SI Nº 77/94
3. c.f. Schedules 2 and 3 of SI Nº 77/94