Waste Licence Application Form (Addendum)

EPA Ref. Nº: *(Office use only)*	

This document does not purport to be and should not be considered a legal interpretation of the provisions and requirements of the Waste Management Acts 1996 to 2003.

Waste Licence Application by
Country Clean Recycling Ltd.
Waste Transfer Station at Churchfield Industrial Estate,
John F. Connolly Road,
Co. Cork

June 2010

Environmental Protection Agency
P.O. Box 5000, Johnstown Castle Estate, County Wexford
Telephone: 053-60600 Fax: 053-60699

Environmental Protection Agency
Application for a Waste Licence

WASTE MANAGEMENT ACTS 1996 to 2003

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FOREWARD

This document comprises an addendum to the Waste Licence Application submitted by Country Clean Recycling Ltd (CCR) to the Environmental Protection Agency on the 5th of February 2009. It should be read solely and in conjunction with the original Waste Licence Application (Waste Licence Application Reference W0257-01).

The Waste Licence application has been updated to reflect changes to the site and the environment as a result of Planning Permission which was received by Cork City Council on the 5th of February 2009. The planning application was subsequently amended and revised by way of further information on the 30th of September 2009, any by way of further clarification on the 8th of January 2010. Planning Permission for the site was granted for the facility by Cork City Council on the 4th of March 2010.

The addendum updates relevant sections of the Waste Licence Application for the facility insofar as the planning impinges on the Waste Licence Application. Therefore any amendments to the site layout, monitoring points, and emissions from the facility as a result of the Planning Permission have been updated to encompass the timeframe between the submission of the Waste Licence Application to the Environmental Protection Agency and the receipt of Planning Permission.

CCR is currently in the process of obtaining a discharge licence for process effluent to the public foul sewer from Cork City Council. The provisions of Section 52 of the Waste Management Acts, 1996 to 2008, provides that the Agency shall obtain the consent of the sanitary authority (Cork City Council) for the proposed discharge to a sewer. Cork City Council (sanitary authority) will forward the EPA the Section 52 notice as planning permission has been granted.

The update to the Waste Licence Application includes an addendum to the following sections of the application:

Section	Attachment/Appendix	Description
Section A Non-Technical Summary	A1.8	Emissions and Treatment
	A.9	Impact of Emissions
	B.2.2	Site Services Plan
	B.2.3	Site Layout including location of site Notice
Section B General	B.3	Most recent planning permission
Section D Infrastructure & Operation	D.1k	Sewage and surface water draining infrastructure.
	D1.m	D.1.m Plant sheds, garages and equipment compound
	D1.3	Sewer & Surface Water Drainage Infrastructure

Section	Attachment/Appendix	Description
Section E Emissions	E.2	Emissions to Surface Water
	Table E.2 (i)	Emissions to Surface Waters
	E.3	Emissions to Sewer
Section F Control & Monitoring	F.1	Treatment, Abatement and Control Systems
	F.3	Surface Water – Monitoring and Sampling Points
	F.4.	Sewer Discharge Monitoring and Sampling Points
Section H Materials Handling	H.3	Food Waste
Section I Existing Environment & Impact of the Facility	I.1.	Assessment of Atmospheric Emissions
	I.2	Assessment of the Impacts of Surface Water Discharges on the Receiving Waters
	I.3.	Assessment of Impact of Sewage Discharge

NON-TECHNICAL SUMMARY

A Non-Technical Summary is to be submitted. The summary should include information on those aspects outlined in the Guidance Note and must comply with the requirements of Article 12 (1) (u) of the Waste Management (Licensing) Regulations, S.I. 395 of 2004.

Amendments to the waste licence application are addressed in the following sections of this document.

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 leachate 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 hardstanding 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.

Country Clean Recycling is currently in the process of obtaining a discharge licence for process effluent to the Cork City Council public sewer. The provisions of Section 52 of the Waste Management Acts, 1996 to 2008, provides that the EPA shall obtain the consent of the Cork City Council for the proposed discharge to a sewer. Cork City Council (sanitary authority) will forward to the EPA the Section 52 notice as planning permission has been granted.

Emissions to Surface Water

Surface water runoff from the hard standings areas around the site (except the roof) will be directed through a Class I Bypass Interceptor to reduce the oil and solids content before entering an attenuation tank. The water will then be discharged to the public storm water sewer at a limited flow rate. All roof runoff will be directed to the storm water attenuation tank prior to discharge to the Cork City Council Town Sewer.

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.

Due to the nature of the facility and the material which is to be used for the construction of roads and yarded areas it is envisaged that no significant dust emissions will be generated.

The potential emissions to air from the operation of the facility are dust and odour. All waste related activities will be restricted to the main waste building thereby mitigating potential nuisance from dust or odour. In addition, biodegradable waste which may have the potential to cause odour nuisance is removed off-site within 48 hours of delivery.

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. Should the need arise County Clean Recycling have an odour abatement system in place to address nuisance odours.

Dust levels at the facility were monitored as part of a request from Cork City Council on two occasions. The first monitoring period was undertaken in April 2009, and the second monitoring period was undertaken in February 2010.

Five monitoring locations (D1-D5) were agreed with Cork City Council and ambient dust monitoring was undertaken and assessed against the Environmental Protection Agency limit value of 350 mg/m^2/day.

During the first round of monitoring D1-D3 were all compliant with the deposition limit value. Elevated dust deposition levels were recorded in the vicinity of the facility, more specifically in the region of sampling location D4 and D5. The source of these elevated levels may be attributed to a combination of off-site as well as on-site activities. These monitoring points are located north of John F Connolly Road which is an internal distributor road for other facilities within the industrial estate. As a result this location was subject to dust emissions associated with the passing road traffic. A dust control plan was recommended to reduce dust emissions within the facility.

During the second round of monitoring a significant decrease in the dust results from the previous sampling period was noted and all dust levels were compliant within the EPA recommended guidelines of 350mg/m^2/day. The decrease in the dust levels at the site was attributed to better onsite dust control measures.

Noise Emissions

In accordance with Condition 8 (e) of the Planning Permission "*Noise during site clearance shall not exceed 75 dB(A), when measured at any point off site. Mitigation measures in Section 7.6 of the EIS shall be implemented as necessary".*

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 waste-handling 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 LA_{90} daytime (15min) to and LA_{90} 34.1-41.9 night time. 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

CCR will operate the facility so as to comply with all emission standards and limits set out by the Environmental Protection Agency in the Waste Licence.

Avoidance of Environmental Pollution

The facility is designed and operated to ensure that it will not cause environmental pollution: some of the design features and operational practices that ensure this are indicated below:

Avoidance of Emissions to Air

- All of waste processing activities will be restricted to a main waste building.
- All waste containing a biodegradable fraction is removed off site within 48 hours of delivery.
- Water-spraying of hard standing areas in periods of dry weather.
- Enclosing the shredder within the Material Recovery Facility to reduce dust emissions.
- A dust misting system will be utilised to suppress dust emissions where necessary.

Avoidance of Emissions to Water

- The entire site will be paved.
- The drainage system will collect all surface water and rainwater arising.
- All discharges from the Materials Recovery Building are directed through an oil interceptor prior to discharge to Cork City Councils Foul Sewer.
- All run-off from waste tipped in the main waste building is directed to an underground tank which is treated via a Class 1 Full Retention Interceptor prior to discharge to the local authority foul sewer, the wastewater is sent for further treatment before discharge to water.
- All sanitary effluent from toilets in the offices/buildings is directed to the sewer.

Avoidance of Other Environmental Nuisances

- The site is cleaned regularly to prevent wind blown litter.
- All waste will be stored within the main waste building and therefore will not be exposed.
- A vermin control plan is implemented onsite and regularly inspected.
- Regular monitoring of agreed parameters as set out in the Waste Licence will ensure that environmental controls are performing.

Noise emissions may arise from operational plant and vehicles during normal operating hours. These emissions will not have a significant impact on Noise Sensitive Receptors.

Best Available Technology (BAT)

CCR 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.

A.10 Monitoring and Sampling

Surface water, dust, and noise monitoring are proposed to be undertaken to assess the impact of activities at the site on the environment. These monitoring operations will be carried out during the operational life of the facility according to the licence issued by the Agency.

Monitoring and Sampling Arrangements

Proposed environmental monitoring is shown in the table below.

Parameter	Frequency
Dust	Three times annually
Noise	Annually
Odour	Weekly
Surface Effluent	Quarterly*

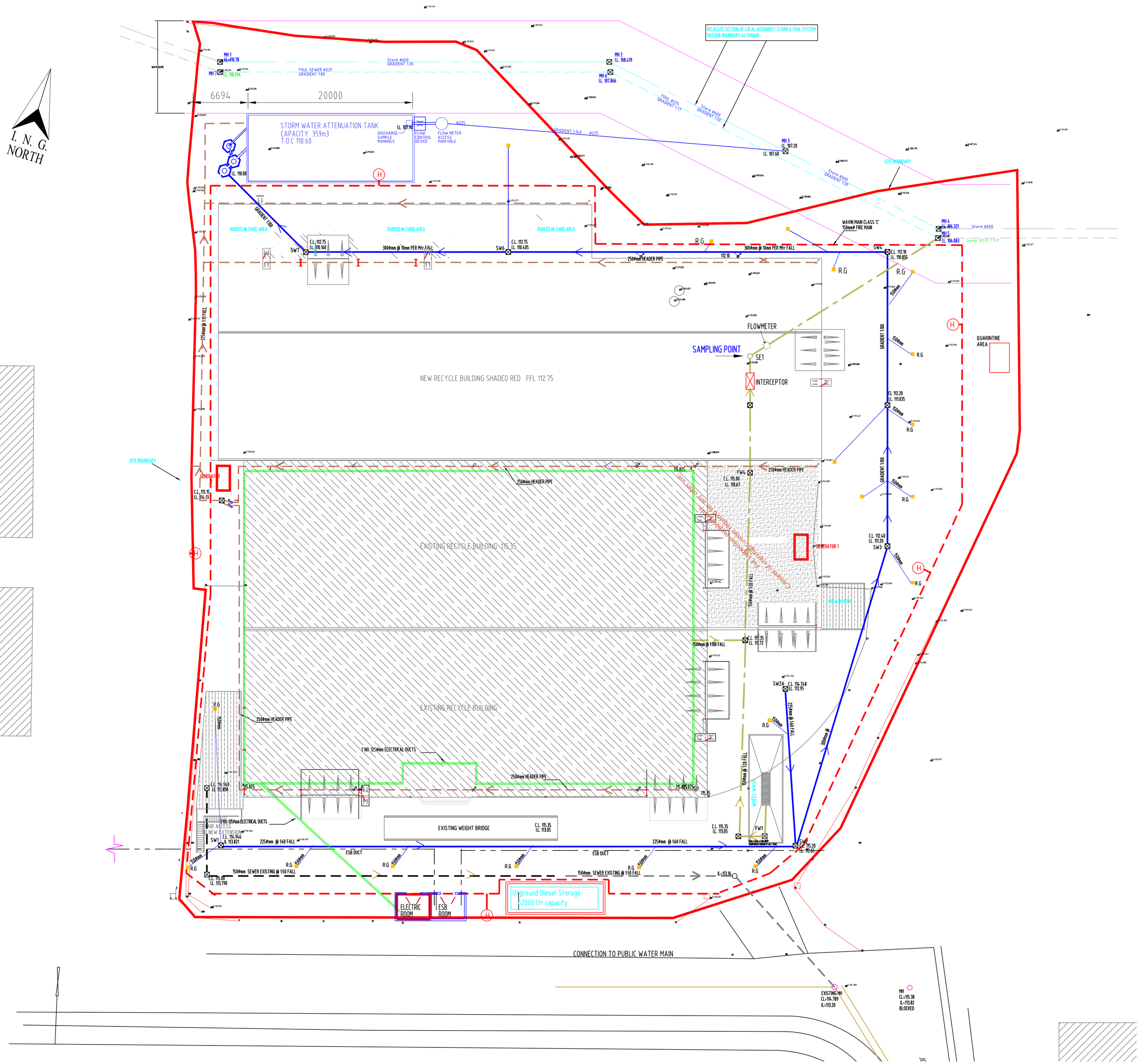
** Or as otherwise specified by Cork City Council*

Appendix B.2.2

Site Services Layout

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

Project Ref: OES1094_09



Site Drainage Plan
Scale 1:250

LEGEND

- NEW MAN HOLES
- EXISTING MAN HOLES
- ELECTRICAL DUCTS
- NEW FOUL SEWER
- NEW STORM WATER
- NEW SURFACE WATER
- NEW ROOF WATER
- EXISTING ROOF WATER
- ESB DUCT
- EXISTING LOCAL AUTHORITY FOUL
- EXISTING LOCAL AUTHORITY STORM
- ACCESS JUNCTION
- NEW ROAD GULLY
- NEW GULLY TRAP
- GULLY TRAP WITH BACK INLET
- DOWN PIPE
- DROP IN PIPE
- "WAVINMAIN" CLASS 'C', I.S. 123 OR OTHER EQUAL & APPROVED; 150mmØ HARD uPVC PIPING; JOINTING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS
- FIRE HYDRANTS
- INTERCEPTOR
- WAYLEAVE PERIMTER

Issue no.	Date	By	Checked	Approved	Note Ref.	Date Scanned
00	03/08	RF	PL	PL		
01	05/10	TQ	PL	PL		

OES consulting
environmental health and safety engineering project management

Tel.: 353 (0)667128321 Fax: 353 (0)667180061 Email: info@oes.ie

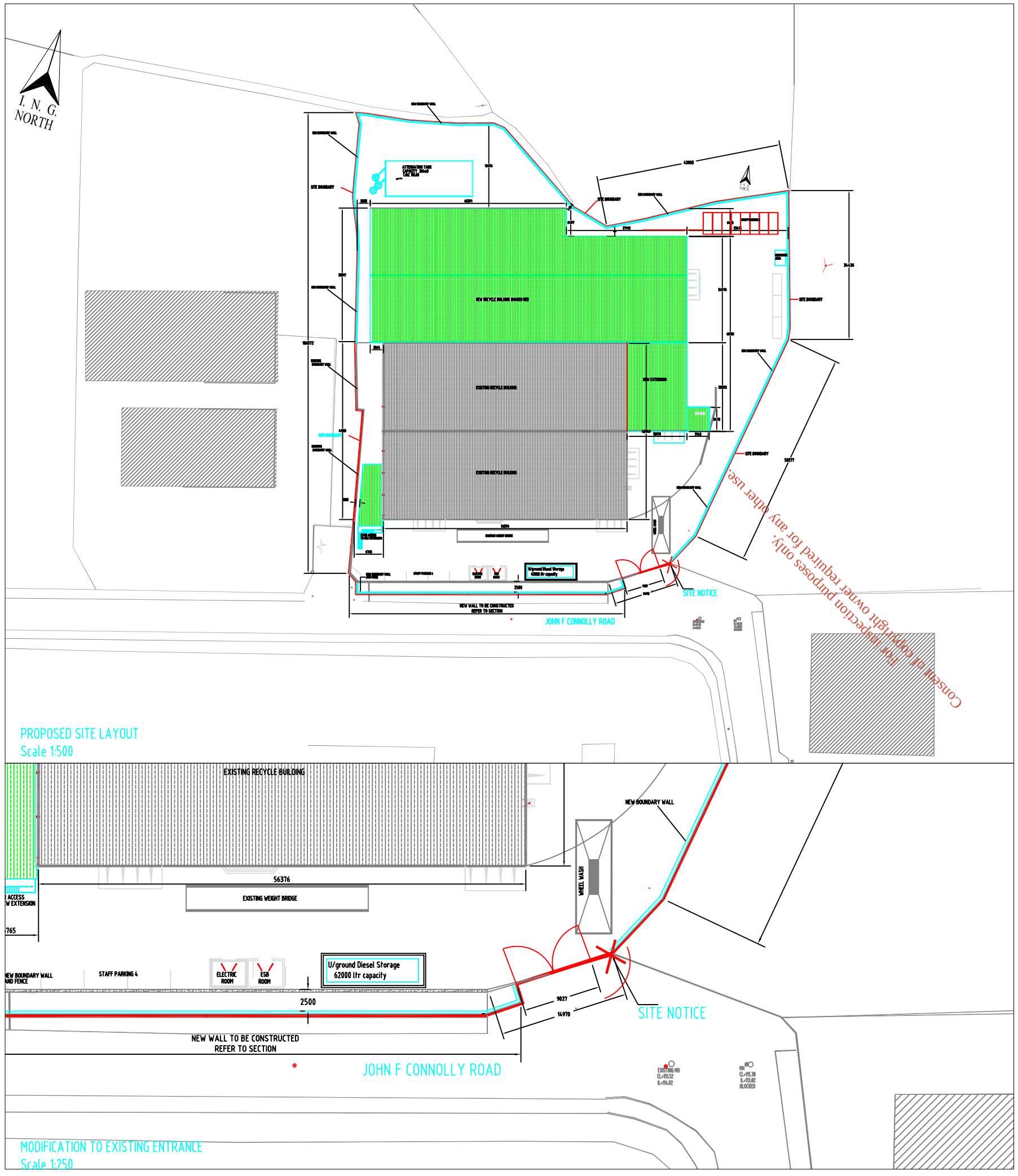
Client	Country Clean Recycling Ltd Churchfield Ind. Estate, John F. Connolly Road, Co.Cork
Title	Site Drainage Plan
Scale	1:250
Project No.	1094-06
Drawing No.	Drawing 2

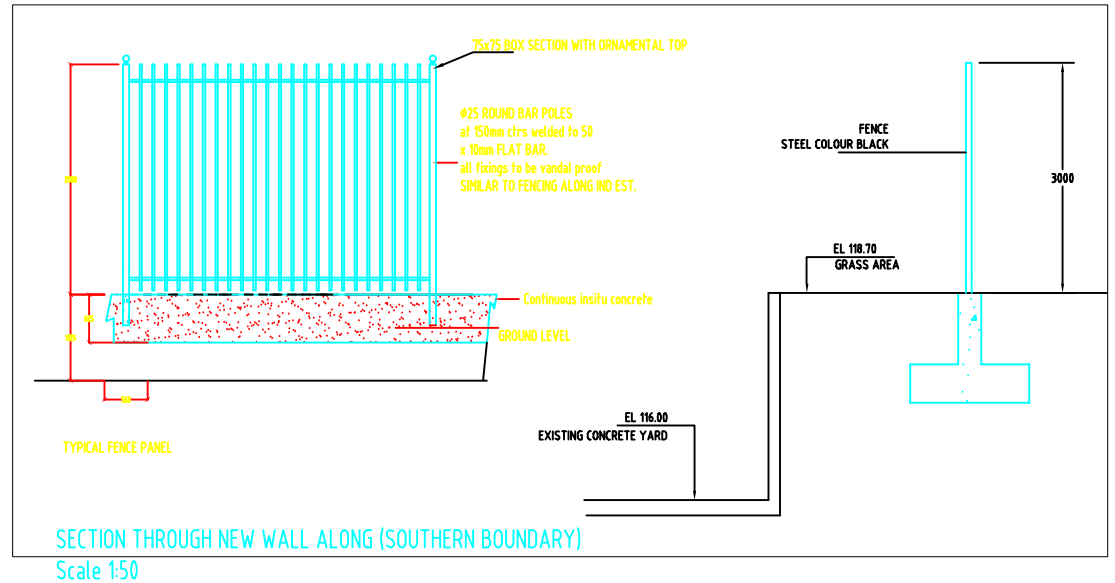
Appendix B.2.3

Site Layout including location of Site Notice

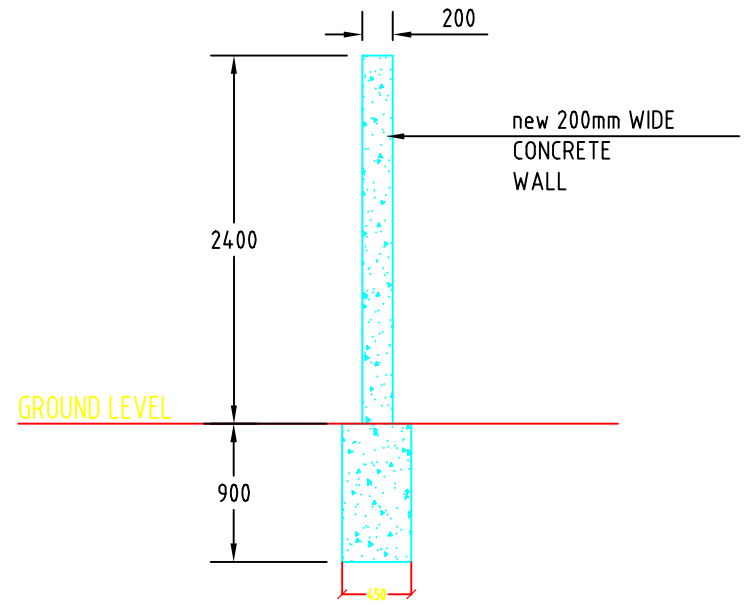
Country Clean Recycling Ltd.
Churchfield Industrial Estate, John F. Connolly Rd., Cork
Addendum Waste Licence Application

Project Ref: OES1094_09





SECTION THROUGH NEW WALL ALONG (SOUTHERN BOUNDARY)
Scale 1:50



SECTION THROUGH NEW BOUNDARY TREATMENT ALONG (NORTHERN/SOUTHERN/EASTERLY BOUNDARY)
Scale 1:25

SITE AREA 8739m2

Issue no.	Date	By	Checked	Approved	Note Ref.	Date Scanned
00	03/08	RF	PL	PL		
01	12/09	RF	PL	PL		

OES consulting

environmental health and safety engineering project management

Tel.: 353 (0)667128321 Fax: 353 (0)667180061 Email: info@oes.ie

Client: Country Clean Recycling Ltd
Churchfield Ind. Estate, John F. Connolly Road, Co.Cork

Title: Site Layout / Entrance & Wall Details

Scale: 1:500/250/50/25

Project No.: 1094_06

Drawing No.: 1094_06_005 (Drawing 5)

Attachment B.3

Planning Details

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

Project Ref: OES1094_09

Attachment B.3 Planning Authority

Appendices

Appendix B.3.3 Planning Permissions & Conditions

The most recent planning permission and all conditions are appended as Appendix B.3.3.

Appendix B.3.3
Planning Permissions & Conditions

Comhairle Cathrach Chorcaí Cork City Council

Halla na Cathrach
Corcaigh.

Fón/Tel: 021-4924000
Faics/Fax: 021-4314238
Líonra/Web: www.corkcity.ie Tag/Ref

Mr. David O'Regan,
Country Clean Recycling Ltd.,
c/o OES Consulting,
FBD House,
Fels Point,
Tralee,
Co. Kerry.

4th March, 2010.

RE: T.P.09/33682 – Decision by Cork City Council to grant permission for an extension to the Country Clean Materials Recover Facility at Churchfield Industrial Estate, John F. Connolly Road.

Dear Mr. O'Regan,

I refer to the attached decision by Cork City Council to grant permission for an extension to the Country Clean Materials Recovery Facility at John F. Connolly Road. You are advised that no works shall be undertaken under this permission until the appropriate notification in relation to either the disposal or licensing of the lands adjoining the site are issued to you by Cork City Council's Property Section.

Yours sincerely,

Senior Staff Officer,
Planning & Development
Directorate.

City Hall
Cork.

COMHAIRLE CATHRACH CHORCAÍ - CORK CITY COUNCIL

PLANNING AND DEVELOPMENT ACT 2000

NOTIFICATION OF DECISION TO GRANT

PERMISSION

SUBJECT TO CONDITIONS UNDER SECTION 34 OF THE ACT OF 2000

TO: Country Clean Recycling Ltd.,
c/o OES Consulting,
FBD House,
Fels Point,
Tralee,
Co. Kerry.

Reg No. T.P.09/33682

Application Received: 05/02/09
Further Information Requested: 31/03/09
Further Information Received: 30/09/09
Clarification of Further Information Requested: 23/11/09
Clarification of Further Information Received: 08/01/10

In pursuance of the powers conferred upon them by the above mentioned Acts, Cork City Council have by order dated 4th March 2010 decided to grant **PERMISSION** for the development of land, namely:
Permission to (a) demolish a section of the existing Materials Recovery Facility (MRF) of approximately 1,336m^2, (b) construct an extension to the MRF comprising 2,980m^2 to include a new materials handling and sorting facility, (c) construct new amenities building comprising offices, changing facilities, canteen and bathroom facilities, (d) construct a new retaining wall along the southern boundary of the site to replace the existing fencing, (e) widen the existing site entrance in order to increase sight lines and safety, (f) construct an underground bunded oil storage tank of 62m^3 capacity, (g) associated ancillary works. This planning application will be accompanied by and Environmental Impact Statement (E.I.S). A waste Licence Application will be submitted to the Environmental Protection Agency in respect of the proposed development.

In accordance with plans and particulars submitted on 05/02/09, Further Information Requested on 31/03/09, Further Information Received on 30/09/09, Clarification of Further Information Requested on 23/11/09 and Clarification of Further Information Received on 08/01/10

Subject to the conditions and reasons set out in the attached Schedule.

If there is no appeal against said decision, a grant of **PERMISSION** in accordance with the decision, will be issued after the expiration of the period within which an appeal may be made to An Bord Pleanala (see footnote).

It should be noted that until a grant of **PERMISSION** has been issued, the development in question is **NOT AUTHORISED.**

NB. This permission is subject to 12 condition(s).

Signed on behalf of Cork City Council

J. Whelan

Senior Staff Officer, Planning & Development Directorate

Date: 04/03/10

NB See Notes Overleaf.

NOTES

1. An appeal against a decision of a planning authority, under section 34 of the Planning and Development Act 2000, may be made to An Bord Pleanála within 4 weeks beginning on the date of decision. An appeal shall be made in writing and shall state the subject matter of the appeal and the grounds of the appeal. An appeal by the applicant for permission **should be accompanied by this form.** In the case of an appeal by any other person, the name of the applicant, particulars of the proposed development and the date of the decision of the planning authority should be stated.

   The correct fee must accompany each appeal to An Bord Pleanála. For clarification of correct fee please contact An Bord Pleanála.

   For details of the new Appeals procedure, please note attached leaflet.

   Appeals should be addressed to: ***An Bord Pleanála,***
   64 Marlborough Street,
   Dublin 1.

2. Grant of permission under the Planning and Development Act 2000 is not to be taken as a waiver of the provisions of any local Act, Order, Regulation or any other Statutory Provision in force in Cork City.

3. This notification does not exempt the applicant from any requirements which the Fire Authority, pursuant to the Fire Services Act, 1981, and the Building Control Regulations, 1992, made pursuant to the Building Control Act, 1990, may require to be implemented. These requirements may call for changes in the constructional details of the development. You are therefore advised to contact the Fire Department, Cork City Council to discuss these matters prior to the submission of the Commencement Notice (as required by Article 6, Part 2 of the Building Control Regulations, 1992) and the making of an application for a Fire Safety Certificate pursuant to Article 9, Part 3 of said Building Control Regulations, 1992 (if applicable).

4. The Applicant should note that changes in the Constructional details consequent on **3** above may require permission under the Planning and Development Act 2000.

5. The Planning Authority, in deciding this planning application, has had regard to any submissions or observations received in accordance with the Planning and Development Regulations 2001-2006.

6. In accordance with Article 20 of the Planning and Development Regulations 2006 you are hereby required to remove forthwith any site notice erected in respect of this planning application.

Comhairle Cathrach Chorcaí Cork City Council

Halla na Cathrach
Corcaigh.

Fón/Tel: 021-4924000
Faics/Fax: 021-4314238
Líonra/Web: www.corkcity.ie Tag/Ref

RE: T.P.09/33682

FIRST SCHEDULE

Having regard to the objectives of the Current Development Plan, the existing pattern of development in the area and the fact that there is an existing MRF facility on the site, it is considered that subject to compliance with the conditions set out in the Second Schedule, the proposed development would not seriously injure the amenities of the area, or of property in the vicinity and would be in accordance with the proper planning & sustainable development of the area.

City Hall
Cork.

Comhairle Cathrach Chorcaí Cork City Council

Halla na Cathrach
Corcaigh.

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Líonra/Web: www.corkcity.ie Tag/Ref

Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

1. The development shall be carried out in accordance with the drawings and specifications (including the EIS) submitted to the Planning Authority on 5/02/2009, as amended by the revised details received by way of further information on 30/09/2009 and by way of clarification of further information on 8/01/2010, except where altered or amended by conditions in this permission.

   Reason: In the interest of orderly development and the proper planning and sustainable development of the area.

2. The proposed vehicular entrance shall be revised so as not to exceed 6.5 metres in width. Prior to commencement of development revised details providing for same shall be submitted for the written agreement of the Planning Authority

   Reason: In the interests of orderly development and traffic safety.

3. Proposed fencing to the roadside boundary shall be coated / painted black.

   Reason: In the interests of visual amenity and orderly development.

4. Prior to commencement of development details of the proposed gate for the new entrance shall be submitted for the written agreement of the Planning Authority. The gate design shall be in keeping with the design of the proposed roadside boundary railings.

   Reason: In the interests of visual amenity and orderly development.

5. Prior to commencement of development, the applicant shall submit landscaping proposals and a timetable for their implementation, for the northern section of the site (inside the relocated boundary wall), for the written agreement of the Planning Authority.

   Reason: In the interests of the visual and residential amenities of the area.

City Hall
Cork.

Comhairle Cathrach Chorcaí Cork City Council

Halla na Cathrach
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Líonra/Web: www.corkcity.ie Tag/Ref

Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

6. No advertisement or advertisement structure shall be erected or displayed on the building, the boundary wall/fencing or within the curtilage of the site without a prior grant of planning permission.

Reason: In the interest of visual amenity.

7.(a) Prior to commencement, Invert Levels and Diameters of existing sewers shall be verified on site. Such verification shall be witnessed by the Planning Authority. The Applicant shall contact the Drainage Section in this respect (021-4924280). Any subsequent alterations required shall be made to Detailed design & longitudinal sections previously submitted to the Planning Authority.

(b) A schedule for the proposed removal of the sewers shall be submitted to and agreed in writing with the Planning Authority as per Further Information Response 7e received on 08/01/10 by the Planning Authority. ; This schedule is to ensure that:
•Flows shall be maintained at all times.
•Access shall be provided at all times to Cork City Council to the full length of the sewers within the site for the purpose of maintenance.
•No permanent structure shall be erected within 5m of the center line of the public sewers, located within the site boundary.
•All buildings shall be designed to allow the full excavation of the public sewer without the need to support the buildings;

(c) All diverted Public Drainage shall be in accordance with the Cork City Council minimum technical standards and shall be taken in charge by the Planning Authority on completion. Each section of sewer shall be tested prior to backfill and the tests witnessed by the Drainage Section.

(d) A monitoring system shall be put in place for a minimum of 6 months after reconnection and /or completion of construction on the site, whichever is longer, to determine the quantity & quality of the effluent in each sewer. Details submitted as Further Information Response 7f received on 08/01/10 by the Planning Authority.

City Hall
Cork.

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Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

7 cont/d....

(e) As Constructed" drawings in agreed electronic format to be provided to the Planning Authority on completion of development. CCTV of sewers to be submitted and agreed with the planning Authority.

(f) Revised wayleaves shall be established in respect of the diverted sewers. Full details of the revised wayleaves shall be submitted to and agreed in writing with the Drainage Section.

(g) All drainage shall be separated throughout. All PAVED and roofed areas, shall discharge to the storm drainage system, except where clarified or exception made in in condition I). All toilets, urinals, wash hand basins, sinks, showers, baths, dishwashers and washingmachines shall discharge to the foul drainage system.

(h) All unroofed yard drainage must be directed to the Storm sewer and be of a quality suitable for such. Runoff from Yards shall be routed through a suitable bypass interceptor /Silt Trap, in accordance with IS EN 858-2:2003, or similar approved by the Planning Authority, prior to discharge to the public sewer. Full details, including details of the proposed maintenance regime, shall be submitted to and agreed in writing with the Planning Authority; Exception to H) is made for drainage from Wheel wash which may be directed to the Foul sewer. Washdown of occassional yard spillages via the Wheelwash petrol seperator /silt trap is also acceptable.

(i) Storm runoff from the whole site shall discharge to the existing public storm sewer located in and at the rear of the site via a single connection. Details of this connection shall be submitted to and agreed in Writing with the Planning Authority on completion of sewer diversion.

(j) The maximum allowable storm runoff from the whole site shall be 4.5ltr/s. Details relating to the proposed storm water attenuation and flow control arrangements shall be as submitted as Further Information Response 7 b& c received on 08/01/10 by the Planning Authority.

City Hall
Cork.

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Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

7 cont/d.....

(k) Wheel Wash shall drain to the foul sewerage via full-retention petrol interceptor /Silt Trap, in accordance with IS EN 858-2:2003, or similar approved by the Planning Authority, prior to discharge to the public sewer. Full details, including details of the proposed maintenance regime, shall be submitted to and agreed in writing with the Planning Authority.

(l) Foul water from the proposed development shall discharge to the existing public foul sewers located both in and at the rear of the site, and at the Public Road to front of site where appropriate. Note levels on foul sewer (Front of site) to be revised to ensure drains can command the soffit of the public sewer. Details of these connections shall be submitted to and agreed in Writing with the Planning Authority.

Reason: In the interests of public health.

8.(a) The Developer shall ensure that no appreciable negative environmental impacts occur because of the construction works associated with this development. The developer shall give particular attention to dust, noise, odour, litter, dirt on public roads, surface water runoff, spillage of fuel oils. Operations liable to produce dust shall be screened and dust suppression devices used where appropriate. Fuel oils and other chemicals shall be adequately bunded, with bunds having volumes of at least 110% of the volumes of fuel stored. The mitigation measures outlined in Section 7 of the EIS shall be implemented as necessary.

(b) All builders' rubble arising from this development shall be assessed for reuse on site. Waste Gypsum shall be segregated and delivered to an appropriate facility. Proposals for dealing with construction and demolition waste shall be submitted to the Planning Authority for agreement.

(c) Construction waste such as wood, metal, and cardboard, shall be segregated and submitted for recycling. Waste Gypsum shall be segregated and delivered to an appropriate facility. Hazardous construction waste such as paint, lubricants, oil, lighting, wood preservative shall be segregated and disposed of at an authorised facility.

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Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

8 cont/d....

(d) The developer shall ensure that any waste moved off site during site clearance operations or construction works is removed by authorised waste contractors only. The material shall be taken only to sites authorised by a local authority or the Environment Protection Agency.

(e) Noise during site clearance and construction shall not exceed 65 dB(A), Leq 30 minutes and the peak noise shall not exceed 75 dB(A), when measured at any point off site. Mitigation measures in Section 7.6 of the EIS shall be implemented as necessary.

(f) Working hours during site clearance and construction shall be restricted to 0800-1800 hours on Mondays to Fridays and to 0800-1600 hours on Saturdays. Activities outside these hours shall require the prior approval of the Planning Authority.

(g) Bored piling as opposed to percussive piling shall be used during site clearance and construction.

Reason: In the interests of orderly disposal and management of waste.

9.(a) The applicant shall submit and agree with Cork City Council Water Department a drawing showing the proposed and existing water main layouts with meters, valves and other fittings prior to commencement on site. The agreed proposal shall then be submitted to the planning authority for record purposes.
The proposal shall include:-

- The existing 100mm diameter water main to be replaced with 150mm diameter Ductile Iron main from the existing 150mm Ductile Iron main, along the boundary of the site up to the existing hydrant. The existing hydrant shall be relocated on to a branch off the new 150mm diameter main with a sluice valve on the branch at no cost to the local authority.
- All water mains 100mm diameter or greater shall be cement lined ductile iron.
- All valves 50mm or greater shall be Anti Clockwise closing.

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Second Schedule

9 cont/d…

- All road and footway water fitting covers shall be marked to indicate what is underneath.
- Marker plates shall be installed for all existing and new water main fittings on or adjoining the site to the satisfaction of the Water Department, Cork City Council.
- Additional valves on the existing water main to the satisfaction of the Water Department.
- Sluice valves shall be placed on all branches including hydrants to the satisfaction of the Water Department.

(b) The MRF facility shall have:-

(i) A metered water supply. The metering arrangements shall be agreed with the City Council Water Department. It shall include it's own isolation valve, meter and suitable access for the Water Department.

(ii) Cold water storage of not less than one days demand shall be provided, confirmed in writing.

(iii) All fittings except drinking points shall be fed from storage.

(iv) Each WC suite installed in existing non-domestic premises, whether in an additional WC suite or a replacement for an existing suite, shall have a maximum flush of 6 litres using a multi flush or single flush facility.

(c) The applicant shall ascertain that the flow and pressure at the critical points within the development shall meet the minimum requirements of the Fire Department Cork City Council prior to commencement on site.

(d) All work shall comply with the City Council' General Specification for Water mains and Services for New Developments.

(e) A 1:200 map showing the position of existing / proposed meters plus details of the minimum flow for the site shall be submitted to the Water Department prior to development commencing. The meter for the site shall be non-restrictive type suitable for recording the minimum flow for the site. The meter shall be located to ensure all water to the site is recorded and easily accessible to both the user plus the Water Department personnel.

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Second Schedule

9 cont/d.....

It shall be fitted with a transponder to Water Department specification.
New Meters to Cork City Council Water Section specification and shall be installed by Water Section staff.

(f) Any redundant water services shall be traced back to the public main by the developer and shall be blanked off by Cork City Council at the developer's expense.

(g) Any existing lead services pipes to the site shall be replaced / made redundant at no cost to the Local Authority. This work shall be carried out to the satisfaction of the Water Department Cork City Council.

(h) The various water connections shall be agreed with the Cork City Council Water Section before work commences.

(i) As constructed drawings of the site clearly showing the new and the existing water main system and surrounding features shall be submitted to the Water Section of Cork City Council prior to occupation of the development. The drawings shall be in both digital (AutoCAD) and paper format to National Grid Co-ordinates. The records shall be provided to the satisfaction of the Water Section of Cork City Council. The Council reserves the right to require the developer to trace the water main system in order to prove the as-built records at no expense to the Local Authority.

Reason: In the interests of a satisfactory water supply.

10.(a) In General – The applicant shall be responsible for the immediate temporary reinstatement to make safe any damage to public road/footway adjoining the development during the course of the works. Permanent reinstatement, if required, shall subsequently be carried out by Cork City Council at the applicant's expense. The cost shall be calculated in accordance with the Roads Directorate Reinstatement Charges prevailing at the date of the repair. Or alternatively the work shall be carried out by the applicant at the applicant's expense to agreed detail and at the sole discretion of Cork City Council.
(NB €210.00 per square metre for footpath renewals is the current rate used by Cork City Council).

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Second Schedule

10 cont/d.....

(b) The proposed gate shall not be capable of opening outwards, so as not to obstruct public footpath (or road).

(c) Surface water from site shall not run across public footpath (or road).

(d) Footpath (longitudinal) gradient shall run evenly with the road gradient.

(e) External lighting shall not cause glare on road traffic, to Cork City Council satisfaction.

(f) A public lighting layout and spec. to CEN standard, in accordance with Cork City Council standard shall be lodged to and for Cork City Council's approval, prior to installation and installed at applicant's expense, to address John F. Connolly Road.

Reason: In the interests of safety of pedestrians and road users.

11.(a) Prior to the commencement of the proposed development, the Developer shall pay or enter into an agreement with the Planning Authority to pay a contribution to Cork City Council in respect of specific exceptional costs which have been or will be incurred in respect of the provision of work to provide (or re-) new public footway, crossover (or public roadway) being public infrastructure and facilities which will benefit the proposed development.

The present value of the contribution is **€53,280.00** subject to indexation in accordance with the Consumer Price Index prevailing at the date of payment subject further as follows:

(i) Where the provision of work to provide (or re-) new public footway, crossover (or public roadway) is not commenced within 5 years of the date of payment of the contribution, the Planning Authority shall refund the contribution together with any interest that may have accrued thereon for the duration it was held by the Planning Authority.

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Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

11 cont/d…..

(ii) Where the provision of work to provide (or re-) new public footway, crossover (or public roadway) has been commenced but has not been completed within 7 years of the date of payment of the contribution, the Planning Authority shall refund the contribution in proportion to those works which have not been carried out together with any interest that may have accrued thereon for the duration it was held unexpended by the Planning Authority.

(iii) Where the Planning Authority decides not to proceed with the provision of work to provide (or re-) new public footway, crossover (or public roadway) or part thereof, the Planning Authority shall refund the contribution or such part thereof in proportion to those works which have not been carried out together with any interest that may have accrued thereon for the duration and to the extent that it was held unexpended by the Planning Authority.

(b) Or alternatively the provision of work to provide (or re-) new public footway, crossover (or public roadway) which will benefit the proposed development shall be carried out by the applicant at the applicant's expense to the detail agreed with and at the sole discretion of Cork City Council.

Reason: Pursuant to Section 48(2)(c) of the Planning and Development Act 2000 a Special Development Contribution is being levied in respect of this development where specific exception costs, not included in the general development contribution scheme will be incurred, in respect of the provision of work to provide (or re-) new public footway, crossover (or public roadway) which will benefit the proposed development.

12. Prior to the commencement of the proposed development, the Developer shall pay or enter into an agreement with the Planning Authority to pay a contribution to Cork City Council in respect of the following classes of public infrastructure and facilities benefiting development in the City of Cork and that is provided or that is intended to be provided by or on behalf of Cork City Council, in accordance with the General Development Contributions Scheme ("the GDCS scheme"):

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Schedule of Conditions attached to Planning Permission issued by Cork City Council - Ref. T.P.09/33682

Second Schedule

12 cont/d.....

Class 1 - Roads, Transportation Infrastructure and Facilities
Class 2 - Water and Drainage Infrastructure and Facilities
Class 3 - Parks, Recreation, Amenity and Community Facilities

The present value of the contribution as determined under the GDCS made by Cork City Council on the 27th April, 2009 is **€220,185.35,** which sum is subject to indexation in accordance with the Consumer Price Index prevailing at the date of payment and subject further to such exemptions or reductions as apply to the proposed development having regard to the provisions of Table 5 of the GDC Scheme and to such partial refund of 64 % of the contributions paid in respect of first time buyers of residential property, not exceeding 108 square metres, as set out in Table 5 of the GDC Scheme.

Reason: To comply with the General Development Contribution Scheme which was adopted by Cork City Council on 27th April, 2009 and in the interests of the proper planning and sustainable development of the area.

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Attachment D.1

Infrastructure

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

Project Ref: OES1094_01

Attachment D.1 Facility Operation

D.1.k Sewerage and surface water draining infrastructure.

Currently all process water and wheel wash water from the site is fed through a Class 1 Full Retention Oil Interceptor which subsequently flows into Cork City Councils foul water sewer.

On the basis of a 20 year return period event, it was determined that a 15 hour event was the most critical duration and consequently the storm water attenuation tank was based on this event. **The proposed attenuation tank will have a capacity of 346m^3.**

It is proposed to divert all surface runoff from the hard standing paved areas through a Class 1 Bypass Interceptor before the water enters the attenuation tank. Runoff from the roof will run directly to the attenuation tank.

In accordance with the Planning Permission, the discharge to the Cork City Council Storm Sewer will be limited to 4.5litres per second.

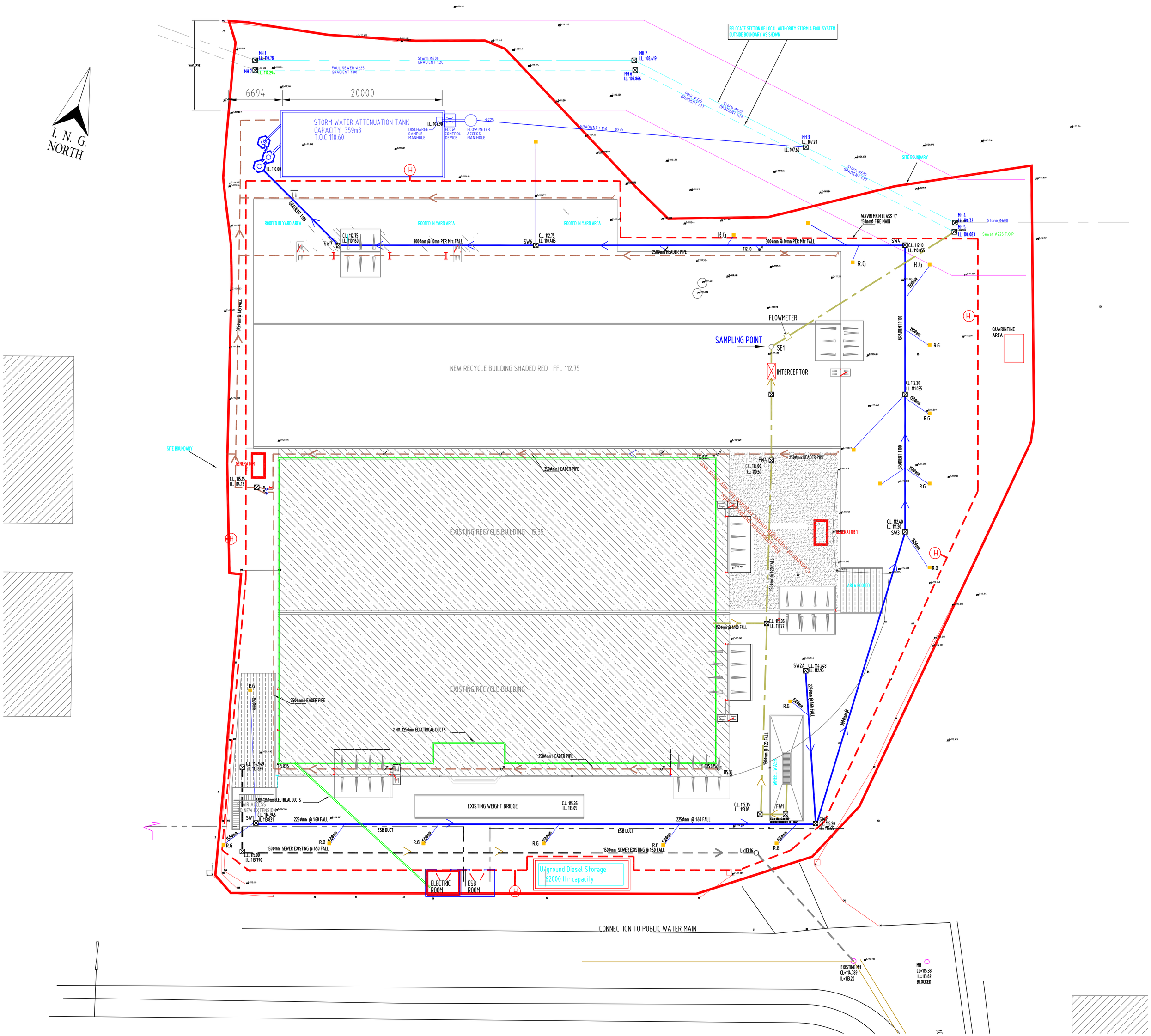
Appendix D.1.3. illustrates the proposed drainage infrastructure for the site.

D.1.m Plant sheds, garages and equipment compound

CCR have received Planning Permission for the following:

(a) demolish a section of the existing Materials Recovery Facility (MRF) of approximately 1,336m^2;
(b) construct an extension to the MRF comprising 2,640m^2 to include a new materials handling and sorting facility;
(c) construct new amenities building comprising offices, changing facilities, canteen and bathroom facilities.

Appendix D1.3
Sewerage and surface water draining infrastructure



Site Drainage Plan
Scale 1:250

LEGEND

- NEW MAN HOLES
- EXISTING MAN HOLES
- ELECTRICAL DUCTS
- NEW FOUL SEWER
- NEW STORM WATER
- NEW SURFACE WATER
- NEW ROOF WATER
- EXISTING ROOF WATER
- ESB DUCT
- EXISTING LOCAL AUTHORITY FOUL
- EXISTING LOCAL AUTHORITY STORM
- ACCESS JUNCTION
- NEW ROAD GULLY
- NEW GULLY TRAP
- GULLY TRAP WITH BACK INLET
- DOWN PIPE
- DROP IN PIPE
- "WAVINMAIN" CLASS 'C', I.S. 123 OR OTHER EQUAL & APPROVED; 150mmØ HARD uPVC PIPING; JOINTING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS
- FIRE HYDRANTS
- INTERCEPTOR
- WAYLEAVE PERIMTER

Issue no.	Date	By	Checked	Approved	Note Ref.	Date Scanned
00	03/08	RF	PL	PL		
01	05/10	TQ	PL	PL		

OES | consulting
environmental health and safety engineering project management

Tel.: 353 (0)667128321 Fax: 353 (0)667180061 Email: info@oes.ie

Client	Country Clean Recycling Ltd Churchfield Ind. Estate, John F. Connolly Road, Co.Cork
Title	Sewerage and Surface Water Drainage Infrastructure
Scale	1:250
Project No.	1094-06
Drawing No.	Drawing 2

Attachment E.2

Emissions to Surface Water

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

Project Ref: OES1094_09

Attachment E.2 Emissions to Surface Water

Attachment E2 contains a copy of:

- Table E.2.(i) Emissions to Surface Water, see Appendix E.2.1
- Table E.2.(ii) Characteristics of the Emission, see Appendix E.2.2

There will be no direct emissions to an open surface water body from the facility. However, storm water arising at the site will be discharged into the local authority storm sewer located at the north of the site, this sewer discharges to a surface watercourse. All roads and hard standing areas will be impermeable and all run off from the roofs will be clean in nature.

Surface water collected from the roof is directed to Cork City Councils storm water network located to the north of the facility. Roof runoff will be directed to a storm water attenuation tank of crica 346m^3. A hydrobreak will limit the volume of water to be discharged to 4.5 litres per second.

The following good housekeeping measures will be observed onsite to minimise the possibility of contamination of surface water run-off:

- All waste material which has the potential to leak will be stored within the Materials Recovery Building.
- All areas of hardstanding will be kept clean.
- Absorbent material will be available to clean up and contain accidental spillages.

Sampling of storm water runoff will take place as requested by the local authority. All foul emissions will be discharged to the Cork City Council's sewer system located to the north of the facility.

Appendix E.2.1

Table E.2(i) Emissions to Surface Water

TABLE E.2(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point:

Emission Point Ref. Nº:	SW1
Source of Emission:	Uncontaminated Roof Run-off, Run off from the
Location :	North of Materials Recovery Facility
Grid Ref. (10 digit, 5E,5N):	E166034 N73677
Name of receiving waters:	Cork County council storm water network
Flow rate in receiving waters:	N/A $m^3.sec^{-1}$ Dry Weather Flow $m^3.sec^{-1}$ 95%ile flow
Available waste assimilative capacity:	N/A kg/day

Emission Details:

(i) Volume to be emitted			
Normal/day	m^3	Maximum/day	389 m^3
Maximum rate/hour	16.2 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	_____min/hr _____hr/day _____day/yr

Appendix E.2.2

Table E.2(ii) Characteristics of the Emission to Surface Water

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : ***SW1***

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
This discharge comprises rainwater from hard standing and roofs. Water will pass through a bypass separator which has a pruimary function to remove particulate matter and reduce oil concentration.									

Attachment E.3

Emissions to Sewers

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

Project Ref: OES1094_09

Attachment E.3 Emissions to Sewers

Attachment E3 contains a copy of:

- Table E.3.(i) Emissions to Sewer, see Appendix E.3.1
- Table E.3.(ii) Characteristics of the Emission, see Appendix E.3.2

The Materials Recovery Facility discharges foul water to the Cork City Council Sewer system which traverses the northern boundary of the site. Leachate from the waste processing facility is currently treated in a Class I full retention oil interceptor prior to discharging to the Cork City Council foul sewer.

It is proposed to direct all surface water from paved areas through a Class I Bypass Interceptor prior to discharge to the attenuation tank and release to the local authority storm sewer line. Run off from roofed areas will be conveyed directly to the storm water attenuation tank.

All domestic foul effluent generated on the site discharges to Cork City Councils foul sewer located to the southwest of the site which is of a domestic nature.

Appendix E.3.1
Table E.3(i) Emissions to Sewer

TABLE E.3(i): EMISSIONS TO SEWER (One page for each emission)

Emission Point:

Emission Point Ref. Nº:	Sampling point 1 (SE1)
Location of connection to sewer :	North of the site, post oil interceptor
Grid Ref. (10 digit, 5E,5N):	E66135, N73604
Name of sewage undertaker:	Cork City Council

Emission Details:

(i) Volume to be emitted			
Normal/day	10m^3	Maximum/day	20m^3
Maximum rate/hour	10m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

Appendix E.3.2
Table E.3(ii) Characteristics of the Emission to Sewer

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number : ***SE-1***

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
pH (pH) units		6-9				6-9			
Temperatures		35				35			
BOD		1500				1000	14		
COD		3000				1500	20		
OFG		100				50	0.75		
Suspended Solids		600				400	8		
Conductivity		2000				1500			

** Note the values presented in Table E.3(ii) are those submitted to Cork City Council in CCR's Discharge Licence Application.

Attachment F.1

Treatment, Abatement and Control Systems

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

Project Ref: OES1094_09

Attachment F.1 Treatment, Abatement and Control Systems

Attachment F.1 contains a copy of:

- **Appendix F.1.1** Class I Full Retention Oil Interceptor
- **Appendix F.1.2** Class I Bypass Interceptor

The proposed technologies and other techniques for preventing or, where this is not possible, reducing emissions from the installation/facility are detailed in the EIS.

To Atmosphere

The management of the site including waste handling and other facility procedures employed serve as successful abatement techniques.

All waste-related activities are currently and will continue to be restricted to the Materials Recovery Facility. The hard standing areas of the site are periodically sprayed with water during periods of dry weather. All waste is covered while being transported to the facility. These measures reduce the generation of dust to the atmosphere.

All waste with a biodegradable fraction is temporarily stored and removed offsite within 48 hours of arrival. This reduces the generation of potential odour nuisance. Odour patrols are undertaken on a regular basis, and in the event of a nuisance an odour suppressive mist is deployed to remediate the situation.

Storm Water Runoff

Storm water from the yard and roof (with the exception of the wheel wash) will be conveyed to an attenuation tank to allow controlled release to the storm sewer network.

As agreed with Cork City Council, the size of the attenuation tank for the site has been based upon a 20 year return period storm of 15 hour duration. The size of the attenuation tank required for the site has been calculated as 346m^3. The discharge rate from Country Clean Recycling to the local authority storm sewer is limited to 4.5 litres per second.

All of the runoff from yarded areas will pass through a Class I Bypass Interceptor prior to entering the storm water attenuation tank, the purpose of the interceptor will be to reduce any solids (silt) present in the surface water.

Sewage Treatment

Sewage systems from the offices on site are connected to the Cork City Council foul water network to the north of the facility.

Effluent from processing

Effluent leachate generated from processes within the Material Recovery Facility flows into a Class I Full Retention interceptor for oil and solids separation. The oil and

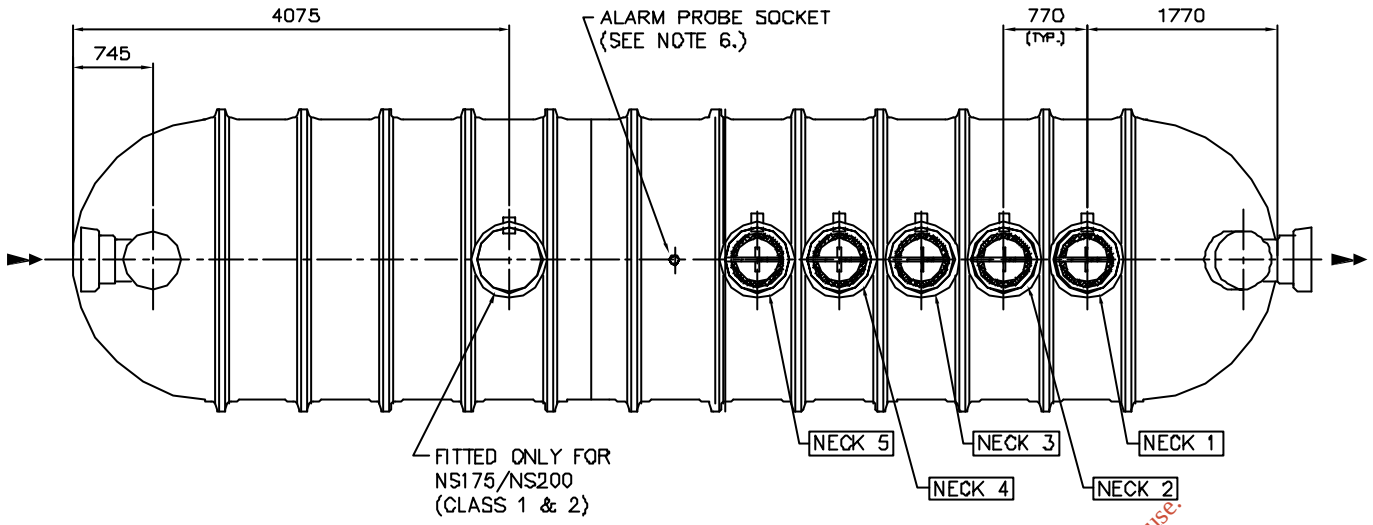
solids separator is connected directly to the Cork City Councils foul water network located to the north of the site.

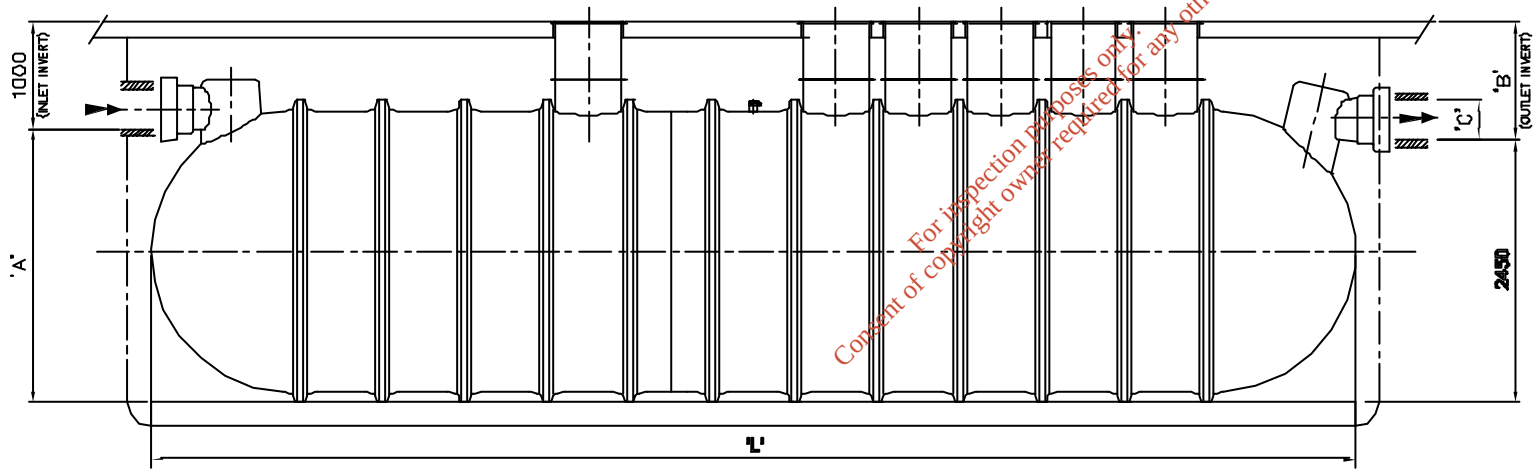
Ground & Groundwater

There are no direct discharges to the ground or groundwater from the site, but there is limited potential for indirect discharges. All internal areas within the site are covered with hardstanding materials and are in good condition. Some external areas have not yet been covered in hard standing material, i.e. the east and to the north of the site. There are no uncontrolled access points to the surface water or foul sewers from within the building and there is no storage of waste or raw materials outside of the building.

All liquid storage areas located in the facility are provided with appropriate secondary containment. Country Clean Recycling will undertake visual inspections of the site and all working areas on a weekly basis. It is not proposed to install monitoring boreholes on the site or to carry out any routine monitoring of soil or groundwater.

Appendix F.1.1
Class I Full Retention Oil Interceptor





NOTES

1.) PLEASE REFER TO TABLE FOR RECOMMENDED STANDARD PIPE SIZES. ALTERNATIVE CONNECTORS MAY BE ORDERED.

2.) EXTENSION NECKS FOR DEEPER INVERTS CAN BE PROVIDED IN 0.5m INCREMENTS FOR ON SITE ASSEMBLY. MAX 2.0m INVERT RECOMMENDED.

3.) ALL UNITS REQUIRE APPROPRIATE COVER & FRAME TO SUIT APPLIED LOADINGS.

4.) THIS DRAWING SHOULD BE USED FOR DIMENSIONAL INFORMATION ONLY. IT IS ESSENTIAL THAT THIS DRAWING IS READ IN CONJUNCTION WITH INSTALLATION GUIDELINES PD0312 (SUPPLIED WITH UNIT).

5.) STANDARD PIPE ORIENTATION SHOWN. FOR OTHER AVAILABLE OPTIONS SEE TDS0033.

6.) AN ø82mm SOCKET CAN BE SUPPLIED AS AN OPTIONAL EXTRA TO HOUSE AN OIL ALARM PROBE. SEE DRAWINGS DS0591 & PD0323 FOR FURTHER DETAILS.

7.) THIS DRAWING IS ALSO AVAILABLE ON OUR WEBSITE www.klargester.com

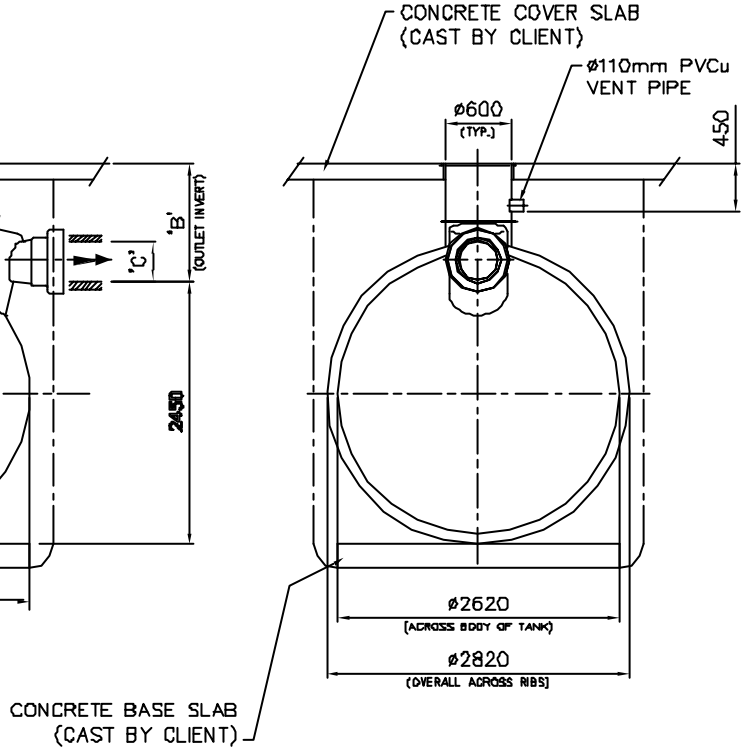


TABLE OF DIMENSIONS

UNIT REF.	UNIT CLASS	NOMINAL FLOW RATE (L/s)	APPROX. EMPTY WEIGHT (Kg)	'L' OVERALL LENGTH	'A' BASE TO INLET INVERT	'B' OUTLET INVERT	'C' STD. PIPE DIA.	TYPE STD. PIPE MATERIAL	NECK 5 FITTED	NECK 4 FITTED	NECK 3 FITTED	NECK 2 FITTED	NECK 1 FITTED
NS80	1	80	1400	5700	2500	1050	315	PVCu				✓	✓
	2												✓
NS100	1	100	1500	6200	2500	1050	400	PVCu				✓	✓
	2												✓
NS125	1	125	1850	7365	2500	1050	450	GRP			✓	✓	✓
	2												✓
NS150	1	150	2200	8675	2550	1100	500	GRP		✓	✓	✓	✓
	2												✓
NS175	1	175	2400	9975	2550	1100	550	GRP		✓	✓	✓	✓
	2												✓
NS200	1	200	2800	11280	2550	1100	600	GRP	✓	✓	✓	✓	✓
	2											✓	✓

ISSUE	DATE	DRAWN	MODIFICATION
1	20.02.08	P.T.	Initial Issue (CC322)

THIRD ANGLE PROJECTION

ALL DIMENSIONS ARE IN MILLIMETRES — DO NOT SCALE

Klargester Environmental
College Road North, Aston Clinton,
Aylesbury, Bucks. HP22 5EW.
Tel- 01296 633000
www.klargester.com

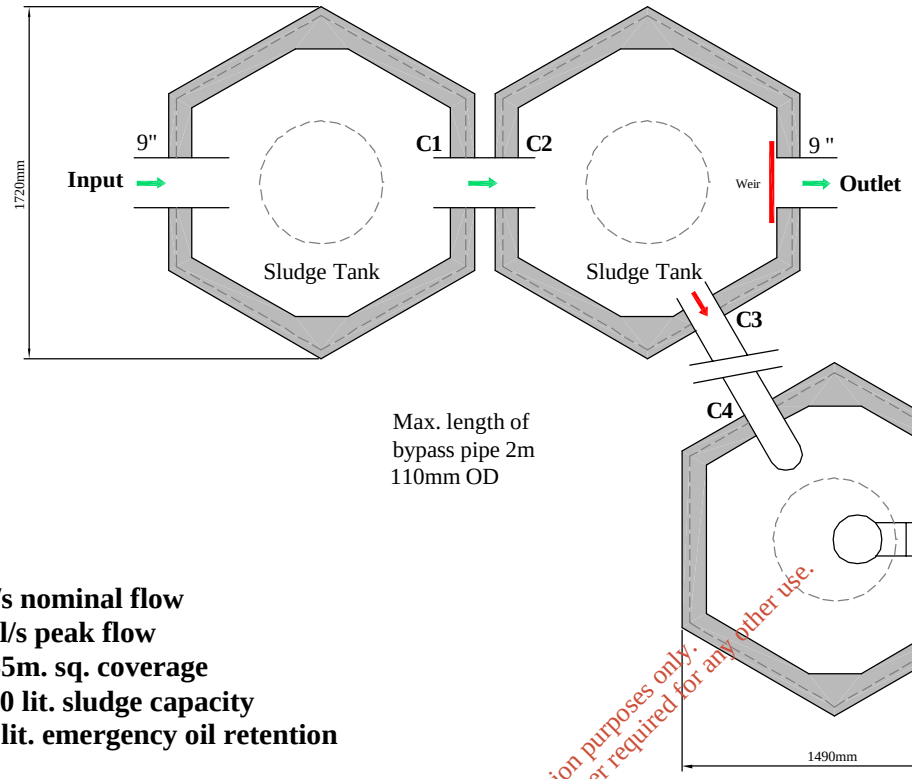
TITLE
NS80–NS200
CLASS 1 & 2
FULL RETENTION
SEPARATORS

SCALE	SHEET SIZE
1:25	A1

DRAWING No.	ISSUE
DS0612K	1

Appendix F.1.2
Class I Bypass Interceptor

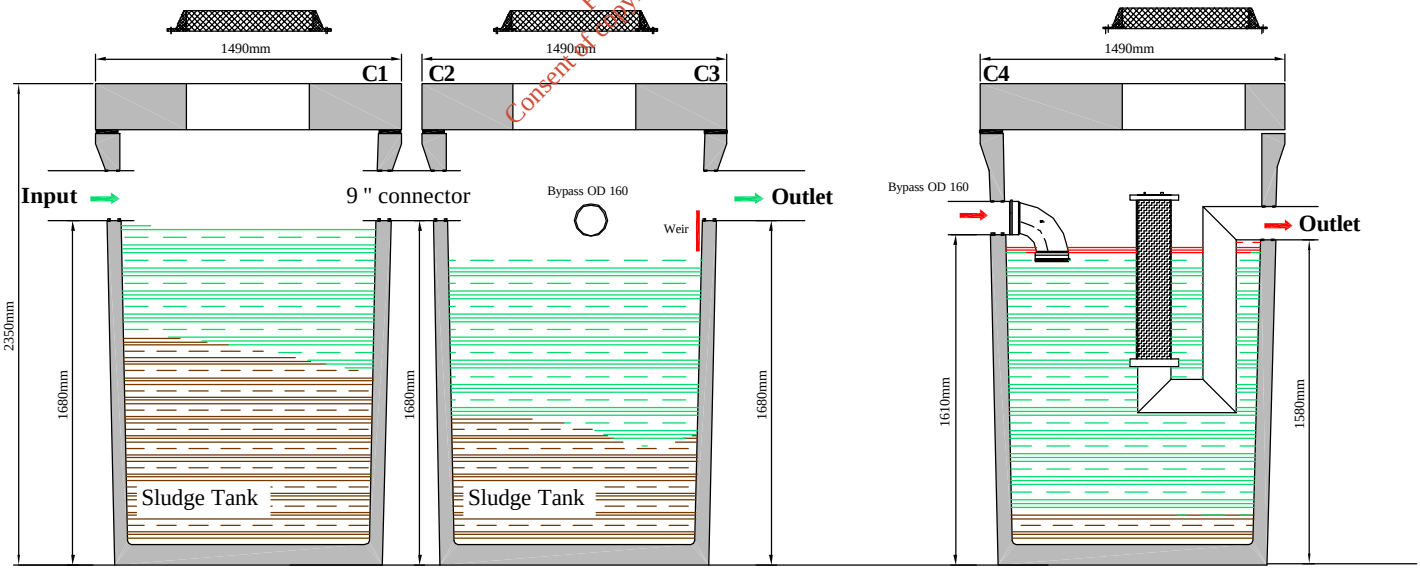
Bypass NSB - 010 - HHH - 9" class 1 interceptor Volume 7,500 lit



An anti-syphon vent is required for long run outflows

Max. length of bypass pipe 2m 110mm OD

10 l/s nominal flow
100 l/s peak flow
5,555m. sq. coverage
1,150 lit. sludge capacity
400 lit. emergency oil retention



All tanks must be placed on a perfectly level and firm suitable base

E-mail: info@molloyprecast.com
Web: www.molloyprecast.com

Aswa clear from MOLLOY PRECAST

Molloy Precast Products Ltd.
Coleraine, Clara Road,
Tullamore, Co.Offaly.
Tel: 05793 26000
Fax:05793 26060

Interceptor Type: Bypass NSB-006-HH-hdp class 1 interceptor Volume 7,500 lit

Tank Size: 1720mm x 1490mm each
Height: 2350mm
Volume: 2500 liters each
Weight: 1500 Kg. each ex.lid

(**Tank Dim:** ± 20mm. **Weight:** ± 30Kg.)

Note: See reverse for excavation details & safety regulations.

Note: Specify hole drilling requirements. All civil works by customer.

Note: Do **NOT** scale from drawings. Drawings for illustration purposes only.

Attachment F.4

Sewer Discharge – Monitoring and Sampling Points

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

Project Ref: OES1094_09

Attachment F.3

Surface Water – Monitoring and Sampling Points

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

Project Ref: OES1094_01

Attachment F.3 Surface Water – Monitoring and Sampling Points

Storm water from the site will be discharged to the Cork City Council Town Sewer which discharges to surface water.

Storm water arising from roofed areas of the site will, for the most part, be of good quality. Runoff water from the yarded areas will pass through a Class I bypass interceptor to permit a reduction in suspended solids and oil concentration.

A sampling point will be installed at the outlet to the attenuation tank to permit determination of the quality of surface water discharged to the Cork City Council storm sewer. The location of all; monitoring points for the facility is illustrated on the drawing entitled 'Sewer Discharge & Monitoring Points' appended as Appendix F.3.1.

Appendix F.3.1

Sewer Discharge & Monitoring Points

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

Project Ref: OES1094_09

I. N. G.
NORTH

6694
20000

STORM WATER ATTENUATION TANK
CAPACITY 359m3
T.O.C 110.60

DISCHARGE SAMPLE MANHOLE
FLOW CONTROL DEVICE
FLOW METER ACCESS MAN HOLE

RELOCATE SECTION OF LOCAL AUTHORITY STORM & FOUL SYSTEM OUTSIDE BOUNDARY AS SHOWN

Stormwater Discharge Point

Foul Water Discharge Point

SITE BOUNDARY

ROOFED IN YARD AREA

NEW RECYCLE BUILDING SHADED RED FFL 112.75

EXISTING RECYCLE BUILDING

EXISTING WEIGHT BRIDGE

SAMPLING POINT
SE1
FLOWMETER
INTERCEPTOR

QUARANTINE AREA

Underground Diesel Storage
12000 ltr capacity

ELECTRIC ROOM
ESB ROOM

CONNECTION TO PUBLIC WATER MAIN

Sanitary Discharge Point

Site Drainage Plan
Scale 1:250

LEGEND

- NEW MAN HOLES
- EXISTING MAN HOLES
- ELECTRICAL DUCTS
- NEW FOUL SEWER
- NEW STORM WATER
- NEW SURFACE WATER
- NEW ROOF WATER
- EXISTING ROOF WATER
- ESB DUCT
- EXISTING LOCAL AUTHORITY FOUL
- EXISTING LOCAL AUTHORITY STORM
- ACCESS JUNCTION
- NEW ROAD GULLY
- NEW GULLY TRAP
- GULLY TRAP WITH BACK INLET
- DOWN PIPE
- DROP IN PIPE
- "WAVINMAIN" CLASS 'C', I.S. 123 OR OTHER EQUAL & APPROVED; 150mmø HARD uPVC PIPING; JOINTING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS
- FIRE HYDRANTS
- INTERCEPTOR
- WAYLEAVE PERIMTER

Issue no.	Date	By	Checked	Approved	Note Ref.	Date Scanned
00	03/08	RF	PL	PL		
01	05/10	TQ	PL	PL		

OES consulting
environmental health and safety engineering project management

Tel.: 353 (0)667128321 Fax: 353 (0)667180061 Email: info@oes.ie

Client	Country Clean Recycling Ltd Churchfield Ind. Estate, John F. Connolly Road, Co.Cork
Title	Sewer Discharge & Monitoring Points
Scale	1:250
Project No.	1094-06
Drawing No.	Drawing 4

Attachment F.4 Sewer Discharge – Monitoring and Sampling Points

Attachment F.4 contains a copy of:

- Appendix F.4.1 Table F.4 Sewer Discharge Emissions Monitoring

It is proposed to monitor process water post treatment in a Class I Full Retention Oil interceptor prior to entering the Cork City Council sewer pipeline.

Wash water from the lorry wash bay and leachate from the waste are the only wastewater streams which arise at the facility. Both streams pass through a Class I interceptor prior to discharge to the local authority sewer. A manhole after the interceptor is provided to allow access for sampling and analysis of the leachate quality.

Surface water from hardstanding areas will pass through a Class I Bypass interceptor prior to discharge to the attenuation tank. Runoff from roofed areas will be diverted directly to the attenuation tank. Monitoring of surface water runoff will take place after the attenuation tank prior to discharge to the local authority sewer. from all paved areas will take place post oil interceptor and prior to the connection with Cork City Councils Foul network. All surface runoff and washwater from the wash bay and leachate from the processing area will be directed through the oil interceptor prior to discharge to the foul network north of the site. Sampling will take place at the outlet of the oil water interceptor. Although extensive sampling has not been undertaken on the quality of the effluent discharged from the site, the results of a number of parameters analysed are presented in the table below.

Sampling Location SE1		
Parameter	Unit	Result
BOD	mg/l	281
Total Suspended solids	mg/l	58
Oils fats and Greases	mg/l	1
Electrical conductivity	uS/cm	3072
pH	pH units	7.8
COD	mg/l	374

Appendix F.4.1

F.4 Sewer Discharge Monitoring Schedule and Sampling Points

TABLE F.4: SEWER DISCHARGE EMISSIONS MONITORING AND SAMPLING POINTS

Emission Point Reference No(s). : _____

Parameter	Monitoring frequency	Accessibility of Sampling Points	Analytical Method
Oils fats and greases	Quarterly	Suitable	Standard Method
Heavy metals	Quarterly	Suitable	Standard Method
Nitrogen	Quarterly	Suitable	Standard Method
Biochemical Oxygen Demand	Quarterly	Suitable	Standard Method
Chemical Oxygen Demand	Quarterly	Suitable	Standard Method
Conductivity	Quarterly	Suitable	Standard Method
Mineral Oil	Quarterly	Suitable	Standard Method

I. N. G.
NORTH

6694
20000

STORM WATER ATTENUATION TANK
CAPACITY 359m3
T.O.C 110.60

DISCHARGE SAMPLE MANHOLE
FLOW CONTROL DEVICE
FLOW METER ACCESS MAN HOLE

RELOCATE SECTION OF LOCAL AUTHORITY STORM & FOUL SYSTEM OUTSIDE BOUNDARY AS SHOWN

Stormwater Discharge Point

Foul Water Discharge Point

SITE BOUNDARY

ROOFED IN YARD AREA

NEW RECYCLE BUILDING SHADED RED FFL 112.75

EXISTING RECYCLE BUILDING

EXISTING WEIGHT BRIDGE

SAMPLING POINT
SE1
FLOWMETER
INTERCEPTOR

QUARANTINE AREA

Underground Diesel Storage
12000 ltr capacity

ELECTRIC ROOM
ESB ROOM

CONNECTION TO PUBLIC WATER MAIN

Sanitary Discharge Point

Site Drainage Plan
Scale 1:250

LEGEND

- NEW MAN HOLES
- EXISTING MAN HOLES
- ELECTRICAL DUCTS
- NEW FOUL SEWER
- NEW STORM WATER
- NEW SURFACE WATER
- NEW ROOF WATER
- EXISTING ROOF WATER
- ESB DUCT
- EXISTING LOCAL AUTHORITY FOUL
- EXISTING LOCAL AUTHORITY STORM
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- DOWN PIPE
- DROP IN PIPE
- "WAVINMAIN" CLASS 'C', I.S. 123 OR OTHER EQUAL & APPROVED; 150mmø HARD uPVC PIPING; JOINTING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS
- FIRE HYDRANTS
- INTERCEPTOR
- WAYLEAVE PERIMTER

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Client	Country Clean Recycling Ltd Churchfield Ind. Estate, John F. Connolly Road, Co.Cork
Title	Sewer Discharge & Monitoring Points
Scale	1:250
Project No.	1094-06
Drawing No.	Drawing 4

Attachment H.3

Waste Handling

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

Project Ref: OES1094_06

Attachment H.3 Waste Handling

1. Food Waste

In light of the recent Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009), businesses producing in excess of 50 Kg of food waste are required to segregate food waste at source and send off site as a separate waste stream. The Regulations are borne from targets set out in the Landfill Directive which aim to divert biodegradable municipal waste from landfill sites. These Regulations have come into affect since the 1st of July 2010, and are borne from the Landfill Directive.

To facilitate commercial customers meet their obligations under the Waste Management Regulations, County Clean Recycling (CCR) are sending dedicated bins out for collection and storage of food waste.

2. Quantity

CCR anticipate that they will collect a maximum of 8-10 tonnes of food waste per week from the dedicated food waste bins from commercial clients.

On annual basis, CCR anticipate that 500 tonnes of food waste will be collected and sent for processing.

3. Processing

It is envisaged that a refuse truck dedicated to the collection of food waste will collect the food waste bins from commercial clients. The waste will then be transported to the waste transfer station at CCR where it will be stored in a dedicated skip until transfer to a composting facility. The location of the skip for food waste storage within the transfer facility is shown on the map entitled "Food Waste Storage Location" attached overleaf.

The waste will not undergo any processing while at CCR. All food waste will be collected from the transfer station at CCR by licensed hauliers and sent to licensed facilities for composting.

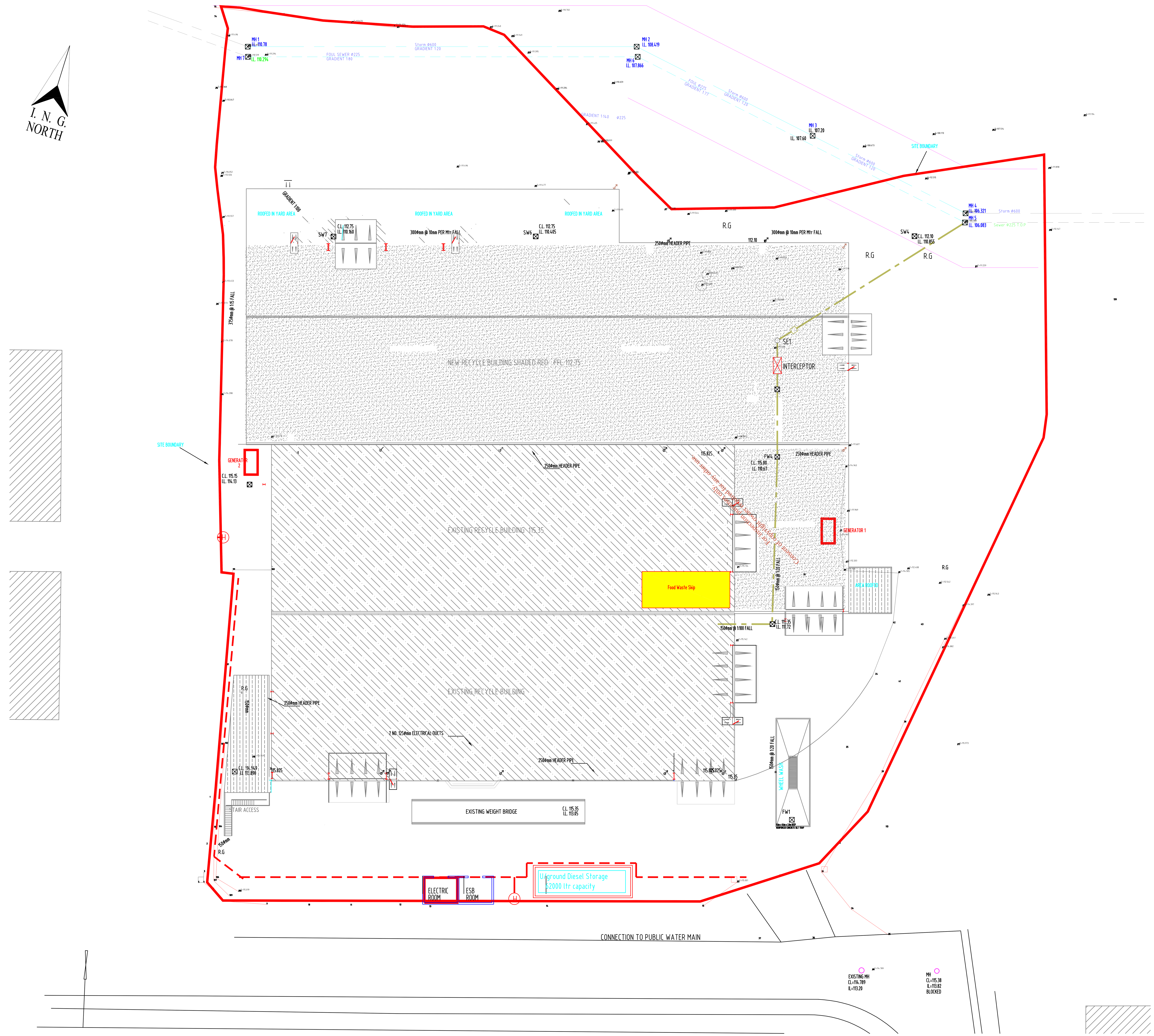
A flow diagram showing the process is illustrated on the diagram below:

3. Environmental Impact

The skip used for storage of the waste at the transfer station is located within the Materials Recovery Building, any potential leachate arising from the facility will be collected within the building and pass through a Full Retention Oil/Silt separator prior to discharge to the foul sewer.

Existing odour control measures in place inside the building will be sufficient to mitigate against odours which may arise from the waste stored in the building. It is also noted that there will be a quick turnaround of waste at the facility so the degree of decomposition will be quite limited, which will further reduce the potential for nuisance odours to arise from the waste.

With respect to vermin, a vermin control plan which is implemented on site and which is subject to regular inspections will ensure that vermin are kept to a minimum.



LEGEND

Food Waste Skip

Site Services Layout
Scale 1:250

Issue no.	Date	By	Checked	Approved	Note Ref.	Date Scanned
00	03/08	RF	PL	PL		
01	12/09	RF	PL	PL		

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Tel.: 353 (0)667128321 Fax: 353 (0)667180061 Email: info@oes.ie

Client: Country Clean Recycling Ltd
Churchfield Ind. Estate, John F. Connolly Road, Co.Cork

Title: Food Waste Storage Location

Scale: NTS

Project No.: 1094-06

Drawing No.: 1094_09_005 (Drawing 5)

Attachment I.1

Assessment of Atmospheric Emissions

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

Project Ref: OES1094_09

Attachment I.1 Assessment of Atmospheric Emissions-

The Environmental Protection Agency air quality index is used to express complex air quality information in simple terms. Five bands are used in the Irish index which range from "*very good"* air quality to "*very poor"* air quality. The air quality near the Country Clean Recycling facility is classified as being of "*Very Good Quality*" in accordance with the EU Air Framework Directive and EPA Air Quality Zones. The facility has the highest air quality index.

The Environmental Protection Agency air quality index is used to express complex air quality information in simple terms. Five bands are used in the Irish index which range from "*very good"* air quality to "*very poor"* air quality. The air quality near the Country Clean Recycling is classified as being of "*Very Good Quality*" in relation to the EU Air Framework Directive and EPA Air Quality Zones. The facility has the highest air quality index.

Dust levels at the facility were monitored as part of a request from Cork City Council on two occasions. The first monitoring period was undertaken in April 2009, and the second monitoring period was undertaken in February 2010.

Five monitoring locations (D1-D5) were agreed with Cork City Council and ambient dust monitoring was undertaken and assessed against the Environmental Protection Agency limit value of 350 mg/m^2/day.

A summary of the dust monitoring results for the facility can be seen in Table E1.1.

Table I.1. Summary of the Dust Monitoring Results for the Facility

Dust Monitoring Location within the Facility	Dust Results December 2009 (mg/m2/day)	Dust Results February- April (mg/m2/day)	TA-Luft Dust Deposition Limit (mg/m2/day)
D1 Northwest of site	104.2	91.5	350
D2 North of site	332.5	107.3	
D3 Northeast of site	248.6	97	
D4 Southeast of site adjacent John F. Connolly Road)	434.1	215.7	
D5 Southwest of site adjacent John F. Connolly Road	506.8	22.3	

During the first round of monitoring (December 2009) D1-D3 were all compliant with the deposition limit value. Elevated dust deposition levels were recorded in the vicinity of the facility, more specifically in the region of sampling location D4, and D5. The source of these elevated levels may be attributed to a combination of off-site as well as on-site activities. These monitoring points are located north of John F. Connolly Road which is an internal distributor road for other facilities within the industrial estate. As a result this location was subject to dust emissions associated with the passing road traffic. A dust control plan was recommended to reduce dust emissions within the facility.

During the second round of monitoring (April 2010) a significant decrease in the dust results from the previous sampling period was noted and all dust levels were compliant within the EPA recommended guidelines of 350mg/m^2/day. The decrease in the dust levels at the site was attributed to better onsite dust control measures. Full details of the dust monitoring reports are appended as Attachment E1.1, and E1.2 of the Application.

For further information relating to air emissions form the site please refer to the EIS.

The onsite operations at the development involve the transfer, sorting, baling and recycling of waste material. Hence, there are no major scheduled emissions (i.e. through stacks, vents, etc.) planned for the development and site activities are unlikely to cause any deterioration in local air quality.

The proposed increase in site operations will require a level of operation that will not impinge on the surrounding environment and comply with Environmental Protection Agency monitoring requirements.

The following mitigation measures are recommended during the construction and operation phases of the proposed development:

- Watering and cleaning of site roads during long dry weather conditions to suppress dust emissions as appropriate;
- Proper maintenance of diesel engines and plant machinery to minimise visible smoke which may contribute towards local nuisance.
- Develop and implement a dust management programme incorporating the use of a bowser to suppress dust on all road surfaces as necessary.
- Regular maintenance and cleaning of all roads i.e. use of a vacuum road sweeper or similar to remove drag-out of silt from trucks leaving the site.

The material recovery facility is equipped with odour abatement spray fans which are utilised during hot periods to ensure that malodorous emissions do not impact the surrounding area. To date there have been no odour related complaints at the facility. These masking agents typically have pleasant odours designed to “mask” the unpleasant odour from the facility.

The following mitigation measures have been recommended to further reduce odour emissions:

- The site layout should be optimised to reduce outdoor operations from sensitive receptors;
- Storage or residence time for waste should be kept to a minimum.
- All wastes which have potential for the generation of odour should be undertaken within the Material Recovery Facility.

- All work surfaces and floors should be cleaned regularly to maintain a suitable standard to prevent the build up of anaerobic bacteria;
- Odour abatement should be utilised in the event that an odour nuisance is generated.

For further information relating to air, please refer to of the Environmental Impact Assessment.

Appendix I.1

Dust Monitoring Report undertaken in December 2009

Energy, Environment & Safety

Country Clean Recycling Ltd

Dust Monitoring Report

May 2009

Scotia Technology Ltd.
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project management ○ engineering ○ safety ○ environment

COUNTRY CLEAN RECYCLING LTD.

DUST MONITORNG REPORT

Disclaimer

This document has been prepared on behalf of and for the exclusive use of **COUNTY CLEAN RECYCLING LTD.** by OES Consulting on the basis of an agreed Programme of Work Scope.

Conclusions and recommendations contained in this Document are based on information supplied by the Client and others. Unless expressly stated otherwise, information provided by Third Parties has not been verified by OES Consulting.

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Document No. R1_109403_02

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01	109403	EM,TM	POL	R1_109403_01	POL	06/05/2009
02	109403	EM,TM	POL	R1_109403_01	POL	11/05/2009

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Tel: 066 7128321 Fax: 066 7180061 Email: info@oes.ie
Registered Number: 376360

Glossary of Terms

CCR	Country Clean Recycling
DCP	**Dust Control Programme** A programme of words which is implemented to improve and achieve air quality standards.
MRF	**Materials Recovery Facility** A Materials Recovery Facility is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers
OELvs	**Occupational (Air) Exposure Limits** Occupational Exposure Limit Value (OELv) – the maximum permissible concentration of a chemical agent in the air at the workplace to which workers may be exposed in relation to 8hr or 15 minute reference period.
PPE	**Personal Protective Equipment** refers to protective clothing, helmets, goggles, or other garment designed to protect the wearer's body or clothing from injury by electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes, and in sports, martial arts, combat, etc. body armor is combat-specialized protective gear.
TSD	**Total Suspended Dust** Total Suspended Dust relates to a measure of all particles that are suspended in air.
TWA	**Time Weighted Average** Determines a person's time-weighted average (TWA) for exposure to a chemical. The total time is the total time of exposure. Typically, this is assumed to be an 8-hour period to determine the compliance with Health and Safety Legislation.
WEL	**Workplace Exposure Limits** Workplace exposure limits (WEL) – is the concentration of a hazardous substances in the air, averaged over a specified period of time referred to as a time weighted average (TWA) i.e. long term (8hr) and short term (15 minutes).

Country Clean Recycling Ltd.

Dust monitoring Report

May 2009

Contents

Attachments

Attachment A	**Figures**
Figure 1	Site Location
Figure 2	Dust Monitoring Locations
Attachment B	General Applications Regulations
Attachment C	Ambient Dust Monitoring Certificate

1. Introduction

OES were engaged by Country Clean Recycling Ltd. (CCR) to undertake dust assessment of their existing waste recovery facility located in Churchfield Industrial Estate, John F. Connolly Road, Co. Cork. The assessment was undertaken in response to a site inspection letter received from Cork City Council on the 3rd of Dec 2008 relating to the requirement for a dust suppression system.

The dust monitoring assessment comprised active monitoring of dust levels within the Materials Recovery Facility (MRF), and ambient monitoring around the external environs of the site. Climatologically data from Cork Airport Weather Met Éireann monitoring station (circa 20km south east of the site) was also reviewed in the evaluation of ambient monitoring dust results.

This report provides the results of active dust monitoring within the Materials Recovery Facility (MRF), and ambient dust monitoring around the site. Where necessary recommendations to reduce for dust emissions from the site have bee noted.

1.1 Site Description

Country Clean Recycling Ltd. (CCR) currently operate a Materials Recovery Facility (MRF) located in Churchfield Industrial Estate, John F. Connolly Road, Co. Cork approximately 1.5 kilometers north of Cork City Centre as can be seen in Figure 1.1 of Attachment A.

CCR's operations involve the transfer, sorting, baling and recycling of waste material. Hence, there are no major scheduled emissions (i.e. through stacks, vents, etc.) planned for the development and site activities are unlikely to cause any deterioration in local air quality.

1.1.1. Waste Licence and Planning Application

CCR are currently in the process of applying to the Environmental Protection Agency (EPA) for a Waste Licence (Reg 257_01)to increase its processing operations to 100,000 tonnes per annum. As part of the licence application a number of dust mitigation measures have been proposed to reduce emissions from the facility.

A planning application and Environmental Impact Statement (EIS) has been submitted to Cork City Council to increase the size of the Waste Transfer Station and undertake associated works as outlined below:

- demolish a section of the existing Materials Recovery Facility (MRF) of approximately 1,336m^2,
- construct an extension to the MRF comprising 2,980m^2 to include a new materials handling and sorting facility,
- construct new amenities building comprising offices, changing facilities, canteen and bathroom facilities,
- construct a new retaining wall along the southern boundary of the site to replace the existing fencing,
- widen the existing site entrance in order to increase sight lines and safety,

- construct an underground bunded oil storage tank of 62m^3 capacity and associated ancillary works.

1.2 Dust Emissions for Facility

The extent of any dust generation depends on the nature of the waste material, the waste sorting activities and the extent of dust control on-site. The potential for dust dispersion depends on the local meteorological factors such as rainfall, wind speed and wind direction.

All dust emitted from the facility can be described as fugitive. The potential source of dust at the site is the MRF, the timber shredder, and hard standing areas in drier conditions. Dust generated in the MRF is as a result of the nature of the waste deposited in the building. The dust arising from the hard standing area is as a result of the traffic movements on the site. The activities of additional vehicles within the Industrial Estate may also generate quantities of dust, particularly in drier weather conditions.

1.1.2. Occupational Dust

Dust is created, not only when solid material is worked on, but also whenever materials are moved or handled.

All dusts and fumes must be regarded as a health hazard. However, the effects of dust and fume particles in the air is dependent not only on their toxicity, but also on their size, which in turn determines whether they can be drawn into the deep lung spaces or are filtered out in the upper respiratory air passages of the nose. A problem associated with constantly working with fumes, gases and vapours is where the nasal passages become used to the substance in question and, as a result, do not warn the employee of possible danger. Most damage and toxic effects occur in the deep lung spaces and those particles are deposited there are called "respirable dust".

Irrespirable dust, on the other hand, refers to airborne material capable of entering the lungs, but which is filtered out by the respiratory tract. Airborne dusts that do not have identifiable toxic effects are termed "nuisance dusts". Where possible, dust-inhibiting measures, including dampening of floors and surfaces, vacuum-cleaning and exhaust ventilation of power tools should be used.

Lung and respiratory disease resulting from dust is called pneumocornosis, derived from the Greek — "pneumo", meaning lung, "corn", meaning dust, and "osis" meaning reaction. The development of pneumoconiosis depends on the type of dust, the susceptibility of the individual, the duration of exposure and the exposure to other chemicals or cigarette smoke at the same time.

Particle size affects toxicity: the smaller the particle, the further down in the lungs it can go, and the greater the amount of dust that will be retained. The more dust retained, the more severe the resulting illness. Microscopic dust particles may be so small that they behave like air, passing unimpeded through the protective barriers of hair in the upper airways.

1.3 Duties of Country Clean Recycling under Legislation

The Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001

Under the Chemical Regulations, Country Clean Recycling are required to ensure that risk from exposure of employees to hazardous substances such as dust is controlled at source or reduced to a minimum.

1.4 The Safety, Health and Welfare at Work (General Application) Regulations, 2007.

Country Clean Recycling must ensure that employees are properly informed, trained and supervised in all aspects of PPE. Employee's duties in regard to PPE must also be enforced. By introducing and running and effective PPE programme Country Clean Recycling would be able to fulfil all their duties under these regulations.

1.5 Dust Control Strategies

Having determined the level of dust and compared the level to the OEL a control strategy must be implemented. It is normally recommended that corrective action be taken immediately if the measured concentrations exceed 1 mg/m^3. There are two options:

- Zero exposure policy: This is usually impossible.
- Permit certain levels of exposure: These levels are applied to the workplace environment. Part of the safety procedures may involve the workers having to wear personal protective equipment. Some substances can be absorbed through the skin and airborne levels will not indicate total exposure. In these cases, measures to prevent skin absorption must be put in place.

There is a number of possible control measures designed to ensure that the workforce is subjected to as little contamination as is reasonably practicable. These control strategies include:

- Elimination

This simply means completely eliminating the potentially toxic material.

- Substitution

This involves the substitution of the operations by safer alternatives.

Process Substitution. This can take a number of forms:
Applying water close to the dust source can reduce dust hazards. This is usually done when sweeping out dusty areas.

- Isolation:

The process is carried out away from the work area, as for the processing of dust generation.

- Segregation or Enclosure

This strategy involves enclosing the process totally. Examples would be enclosing a noisy machine by a physical barrier of absorbent material or enclosing dusts thus preventing their escape to the rest of the workplace.

In some cases, a particular process such as cleaning may be carried out only at night when a minimal workforce is present.

- Exhaust Ventilation

Where it is not practical to enclose the process totally, removing gases, vapours, dusts and fumes using extraction systems can contain contaminants. These systems trap contaminants close to their source by filtering or delivering them to the outside atmosphere, thus preventing exposure to nearby workers. When using this strategy, care should be taken to ensure that other employees and the surrounding community is not contaminated and that only clean air is returned to the work atmosphere.

- Personal Hygiene and Good Housekeeping

Personal hygiene and good housekeeping are necessary to ensure minimal contact with dust. Procedures should be laid down for immediate cleaning of the Waste facility and the regular cleaning of workstations. Adequate washing and eating facilities on site are also necessary together with instructions on hygiene measures required to prevent contamination.

- Training and Education

Because occupational health hazards cannot be seen, workers should be educated about them and know how they should be controlled.

2. Methodology

The scope of the monitoring was agreed in advance with Cork City Council Environmental Department as outlined below.

2.1 Active Dust Monitoring

Active dust monitoring comprised an assessment of TSD within the MRF at 4 fixed sampling points to determine the levels of nuisance dust present. The monitoring locations can be seen in Figure 2 of Attachment A. In total 28 samples were taken, 7 in each of the four locations.

Monitoring of TSD concentrations will allow comparison with the relevant Occupational (Air) Exposure Limits (OEL's) and environmental air quality standards. Whilst measurements of dust deposition will allow an assessment of whether dust nuisance is likely to occur at the nearest sensitive receptors.

The Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001, (as updated in 2007) deal with exposure to hazardous chemical agents (including dust). OELv have been set by the regulations to control dust concentrations. OELv provide a basis for ensuring that exposure to airborne contaminants in the workplace are controlled in such a way as to prevent adverse health affects. Existing information has been used to establish limit values for exposures, which for the majority of chemicals, even when repeated throughout a working life, are not expected to result in adverse effects on health of exposed workers.

The OELv are assessed over an 8hr reference period. This period relates to the procedure whereby the occupational exposures in any 24hr period are treated as equivalent to a single uniform exposure for 8hrs (the 8hr TWA exposure).

The 8-hour TWA may be represented mathematically by:

$$\frac{C1T1+C2T2+...C0T}{8}$$

Where C1 is the occupational exposure and T1 is the associated exposure time in hours in any 24-hour period.

The OELv' for TSD is shown in Table 2.1

Table 2.1 Total Suspended Dust Occupational Exposure

Chemical Sampled	OEL/WEL	STEL/15 min reference
Total Dusts	10 mg/m3	-

NB signifies no OELs/WEL or STEL/15 min ref available for that particular substance.

If an exposure level has exceeded its associated OELv's measures have to be taken to reduce it below its relevant OELv's and at all times exposure levels should be as low as is reasonably achievable.

Information on the General Applications Regulations including duties of the employer and employee is appended as Attachment B of the report.

TSD sampling was carried out by means of an R&P Partisol®-Plus Sequential Air Sampler (Model 2025). The sampler is a manual air sampling platform which has been designed to meet US EPA Reference Designation (RFPS-1928-127). Approximately 24 m^3 of air was sampled over 24-hour periods. The dust particles collected on pre-weighed 47mm diameter glass fibre filters. The Partisol® sampler was programmed to begin and end sampling onto each pre-weighed filter at midnight, which ensured that each filter represented a sampling period of exactly 24 hours.

The TSD monitoring program used a continuous TSD sampler focused on assessing 24-hour average concentrations at four on-site locations (D4-D8) as can be seen in Figure 2 of Attachment A.

Monitoring was carried out over a week period at each location. The results were compared to the over on an eight hour TWA against OELv's for Total inhalable dust (10mg/m^3). The results can be directly compared with the Occupational Exposure Limit value for TSD as outlined in Table 2.1.

2.2 Ambient Dust Monitoring

Dust deposition monitoring was undertaken at five ambient perimeter locations around the site using the VDI Method 2119 Part 2[1] as can be seen in Figure 2 of Attachment A.

The apparatus consists of a plastic pot and a post with a protective basket, set at 1500mm above the ground level in accordance with the guidelines set out in the VDI 2119/Part 2. The ambient dust fall monitoring results were assessed against the Environmental Protection Agency limit value of 350 mg/m^2/day.

Climatological data from Cork Airport Weather monitoring station including wind speed & direction, rainfall, and atmospheric pressure was reviewed as part of the ambient evaluation.

The location of each of the dust monitoring sites is outlined in Table 2.2.

Table 2.2 Ambient Dust Monitoring Locations around the External Environs of the Site

Dust Monitoring Location	Surrounding Environment
D1 Located to the northwest of the facility.	This monitoring location is bounded by a neighbouring facility to the west, the waste recovery facility to the south and east, and adjacent to a Greenfield site to the north.
D2 Located to the north of the facility.	This monitoring location is bounded the waste recovery facility to the south, east, and west, and is adjacent to a Greenfield site to the north.

[1] Measuring of particulate precipitation's - Determination of the dust precipitation with collecting pots made of glass or plastic).- Bergerhoff method

D3 Located to the northeast of the facility.	This monitoring location is bounded by the waste recovery facility to the south and west, and is adjacent to a greenfield site to the north and east.
D4 Located to the southeast of the facility.	This monitoring location is bounded by the waste recovery facility to the north and west, and is adjacent to a greenfield site to the east, and the John F. Connolly Industrial distributor road to the south.
D5 Located to the southwest of the facility.	This monitoring location is bounded by the waste recovery facility to the north and east, and is adjacent to a neighbouring site to the east, and the John F. Connolly Industrial distributor road to the south.

3. Results and Discussion

3.1 Active Dust Monitoring

TSD analysis for the four active monitoring locations (D6-D9) indicated that the results are elevated but are below the OELv's of 10 mg/m3 for total inhalable dust (8-hour TWA).

The results are illustrated in Table 3.1.

The summary for each of the active monitoring locations is outlined below:

Location 1(D9) - TSD concentrations measured ranged from 0.14 to 0.75 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.39 mg/m^3.

Location 2 (D8) - TSD concentrations measured at the Location 2 ranged from 0.09 to 1.18 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.77 mg/m^3.

Location 3 (D7) - TSD concentrations measured at the Location 3 ranged from 0.04 to 1.38 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.78 mg/m^3.

Location 4 (D6) - TSD concentrations measured at the Location 4 ranged from 0.16 to 1.38 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.95 mg/m^3.

TSD concentrations measured at all the locations, were significantly lower than the OEL value of 10 mg/m^3 for total inhalable dust (8-hour TWA). Levels at locations 2-4 were above the 1mg/m^3 which will require a corrective programme to be implemented.

As can be seen from the results daily TSD concentrations measured at the four locations averaged 0.39 – 0.93 mg/m^3, with no exceedences of the Occupational Exposure Limit of 10 mg/m^3. A comparison of the average TSD concentration measured at each of the monitoring locations indicates that levels are slightly higher at the location 4.

The lowest results were recorded on Sunday's at the four locations showing that the dust levels are due to the operation of the site.

Table 3.1: Results of Active Total Suspended Dust Monitoring within the Materials Recovery Facility

	Date	Average Flow litres/min	Volume (m3/day)	First Filter Weight (grams)	Second Filter Weight (grams)	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL) (mg/m3)
Week 1 (D9)	14/03/2009	16.7	24	0.24894	0.25912	0.01018	0.42	10
	15/03/2009	16.7	24	0.25054	0.25396	0.00342	0.14	
	16/03/2009	16.7	24	0.25238	0.25905	0.00667	0.28	
	17/03/2009	16.7	24	0.25428	0.26135	0.00707	0.29	
	18/03/2009	16.7	24	0.25102	0.26914	0.01812	0.75	
	19/03/2009	16.7	24	0.24291	0.25415	0.01124	0.47	
	20/03/2009	16.7	24	0.23576	0.24482	0.00906	0.38	
Week 2 (D8)	21/03/2009	16.7	24	0.23352	0.24002	0.00650	0.27	
	22/03/2009	16.7	24	0.23445	0.23671	0.00226	0.09	
	23/03/2009	16.7	24	0.23368	0.25675	0.02307	0.96	
	24/03/2009	16.7	24	0.22722	0.25145	0.02423	1.01	
	25/03/2009	16.7	24	0.23742	0.26571	0.02829	1.18	
	26/03/2009	16.7	24	0.22800	0.25342	0.02542	1.06	
	27/03/2009	16.7	24	0.22801	0.24822	0.02021	0.84	
Week 3 (D7)	28/03/2009	16.7	24	0.23506	0.24247	0.00741	0.31	
	29/03/2009	16.7	24	0.24351	0.24436	0.00085	0.04	
	30/03/2009	16.7	24	0.24255	0.26561	0.02306	0.96	
	31/03/2009	16.7	24	0.23714	0.25994	0.02280	0.95	
	01/04/2009	16.7	24	0.21282	0.24589	0.03307	1.38	
	02/04/2009	16.7	24	0.23086	0.24991	0.01905	0.79	
	03/04/2009	16.7	24	0.23492	0.25915	0.02423	1.01	

	Date	Average Flow litres/min	Volume (m3/day)	First Filter Weight (grams)	Second Filter Weight (grams)	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL) (mg/m3)
Week 4 (D6)	04/04/2009	16.7	24	0.23042	0.25315	0.02273	0.95	
	05/04/2009	16.7	24	0.23278	0.23667	0.00389	0.16	
	06/04/2009	16.7	24	0.23406	0.26715	0.03309	1.38	
	07/04/2009	16.7	24	0.23126	0.25764	0.02638	1.10	
	08/04/2009	16.7	24	0.23311	0.25634	0.02323	0.97	
	09/04/2009	16.7	24	0.23994	0.25443	0.01449	0.60	
	10/04/2009	16.7	24	0.24180	0.27485	0.03305	1.38	

3.2 Ambient Dust Monitoring Results

The dust monitoring results, detailed in Table 3.5, were assessed against the recommended deposition limit of 350 mg/m2/day (TA –Luft guidelines). A copy of the dust monitoring certificate of analysis is appended as Attachment C of the Report.

Table 3.5 Ambient Dust Monitoring Results for Country Clean Recycling

Dust Monitoring Location within the Facility	Dust Results (mg/m2/day)	TA-Luft Dust Deposition Limit (mg/m2/day)
D1 Northwest of site	104.2	350
D2 North of site	332.5	
D3 Northeast of site	248.6	
D4 Southeast of site adjacent John F. Connolly Road)	434.1	
D5 Southwest of site adjacent John F. Connolly Road	506.8	

As can be seen in Table 3.5 dust monitoring locations D1-D3 were all compliant with the deposition limit value. Elevated dust deposition levels were recorded in the vicinity of the facility, more specifically in the region of sampling location D4, and D5. The source of these elevated levels may be attributed to a combination of off-site as well as on-site activities. These monitoring points are located north of John F. Connolly Road which is an internal distributor road for other facilities within the industrial estate. As a result this location was subject to dust emissions associated with the passing road traffic.

Climatological data obtained from Met Eireann is appended in Attachment C of the report. A windrose which displayed the direction of the wind indicated that the prevailing wind direction was from a south southwest direction.

When viewed within the context of the CCR facility this would support the assertion that exceedences at locations location D4, and D5 for ambient monitoring results are partly attributable to emissions from traffic moving along John F. Connolly Road.

3.3 Mitigation

Materials Recovery Facility (MRF)

CCR should consider introducing a dust suppression programme into the MRF operation.

Misting System

It is recommended that a misting system should be utilised within the MRF to suppress dust. These systems by create a very fine mist < 10 microns in size to dampen down material and the air which prevents dusting in waste and other facilities. In order to ensure that system is effective it should be checked on a regular basis and all checks should be documented.

CCR should commence a programme to control dust exposure and this should have integrated control measures which includes work methods to ensure that control is maintained and checked on a regular basis.

While it is convenient to divide control measures into 'hardware', such as exhaust ventilation or respirators, and 'software' such as operating instructions, it is important not to lose sight of the concept of control measures as an integrated whole.

Country Clean Recycling should consider providing training to all operatives in relation to measures to control suspended dust.

Country Clean Recycling should consider incorporating a Personal Protective Equipment (PPE) programme into the MRF recovery operation. This programme would include the following selection; fitting; use; storage; checking and maintenance; and training.

As part of the site Occupational Health programme lung capacity tests should be included in pre-employment medical and routine medicals.

Routine chemical and biological composition checks of the TSD should be conducted. For example there is a Maximum Exposure Limit (MEL) for respirable crystalline silica of 0.3 mg/m^3 averaged over an 8-hour TWA. It is known that there may be some residual risk of silicosis at prolonged exposures at 0.3 mg/m^3 and every effort should be made to reduce exposures below the MEL. As a result of the residual risk below 0.3 mg/m^3, Health Service Executive UK recommends that all people regularly exposed to respirable crystalline silica dust levels greater than 0.075 mg/m^3 averaged over an 8-hour TWA should be under medical surveillance. Glass dust has significant silica content and routine checks should be conducted to determine the silica content of the TSD.

External Environs of the Site

To ensure that no dust nuisance occurs as a result of the operation of the facility a series of measures are recommended as part of a Dust Control Plan (DCP).

The DCP should provide an effective DCP to prevent nuisance to neighboring sites and adjacent road users when the facility is in operation. The DCP minimization plan will be reviewed regularly during the construction phase to ensure the effectiveness of its control procedures.

The following control measures are recommended to be included in the DCP:

- As part of a current planning application it is proposed to house the timber shredder within the MRF to eliminate ambient dust emissions.

- The soft ground located to the north of the yard should be paved with concreted so that it can be swept clean on a regular basis.

- Plastic curtains will be installed at the doors of the waste transfer building to further reduce the dispersion of any dust from the facility.

- Speed restrictions of 15 km per hour will be applied to vehicles delivering and removing materials to and from the site.

- All waste materials which are likely to generate dust emissions should be stored within the MRF with the exception of glass and metal, which are housed outside in designation storage bays.

- Site entrance roads, which may potentially give rise to fugitive dust, will be regularly watered as appropriate during dry and/or windy conditions. These roads will be inspected for cleanliness, and cleaned as necessary.

- Proper maintenance of diesel engines and plant machinery to minimise visible smoke which may contribute towards local nuisance.

The DCP should be reviewed on a regular basis to ensure that procedures are minimizing dust emissions.

Future activities at the facility are likely to generate larger quantities of dust however it is considered that the above mitigation within the MRF will assist in eliminating the source of dust within the site. Also the DCP coupled with the regular cleaning of the site will ensure that the operations at the facility should not impact significantly on the surrounding environment.

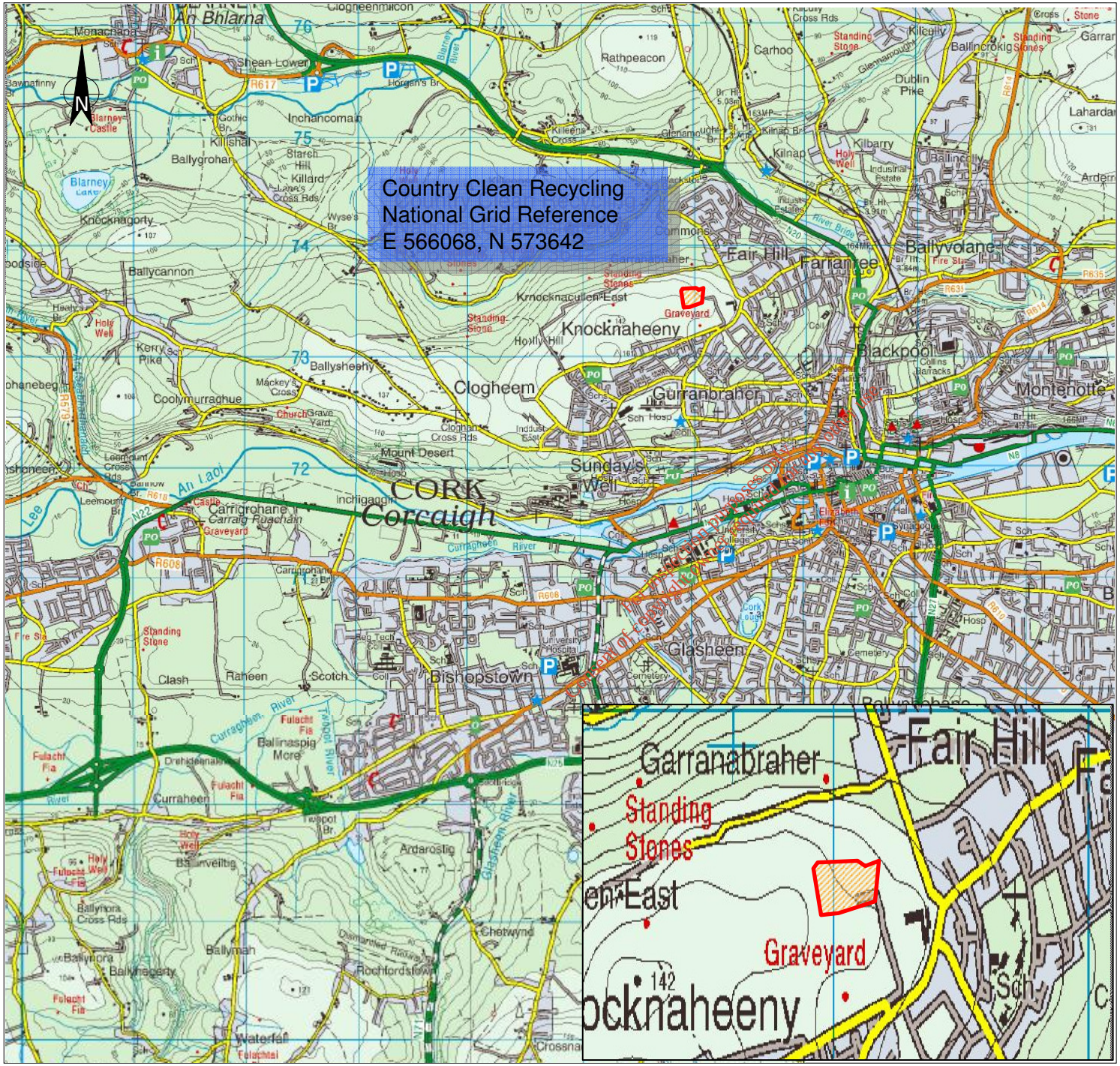
It is recommended that once the above mitigation measures have been implemented another dust monitoring programme is undertaken to monitor improvements within the site.

4. Conclusions and Recommendations

All results for active dust monitoring (TSD) measured at all the locations were significantly lower than the OEL value of 10 mg/m^3 for total inhalable dust (8-hour (TWA).Notwithstanding the above a corrective action programme should be implemented as the results are slightly above the 1mg/m^3 which requires the implementating of a corrective action programme which should incorporate the above mentioned preventative measures and undertake regular monitoring to ensure levels remain below 1mg/m^3.

Ambient dust monitoring results indicate that while elevated levels of dust deposition were recorded in the immediate vicinity of the site, these were attributed to a combination of on-site and off-site activities carried out adjacent to the site. It is anticipated that the elimination of dust emissions within the MRF at source, coupled with the implementation of a DCP ambient levels at elevated locations should decrease below the Environmental Protection Agency limit value of 350 mg/m^2/day.

Attachment A
Figures



Legend

Site Location

Issue no.	Date	By	Checked	Approved	Note Ref	Date Scanned

OES consulting

environmental health and safety engineering project management

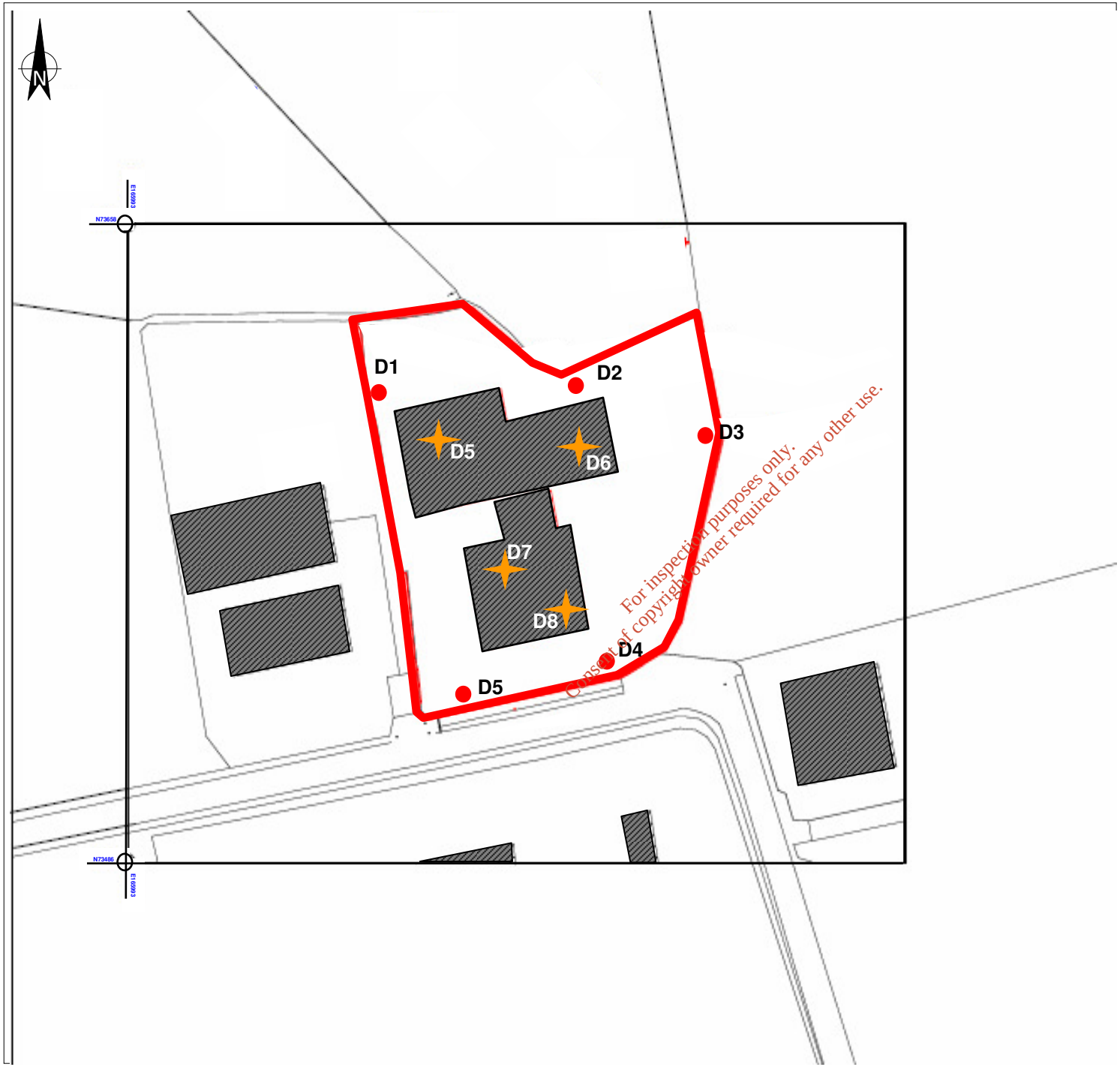
Tel: 353 (0)667128321 Fax: 353 (0)66 7180061 Email: info@oes.ie

Client: **County Clean Recycling**

Title: **Site Location**

Scale: NTS | Project No.: 1094_03

Figure No.: Figure 1 | Rev.: 01



Country Clean Recycling Ltd. Site Boundary

Proposed ambient dust monitoring perimeter locations D1-D5

Proposed active dust monitoring perimeter locations D5-D8

Issue no.	Date	By	Checked	Approved	Note Ref	Date Scanned

OES consulting

environmental health and safety engineering project management

Tel: 353 (0)667128321 Fax: 353 (0)66 7180061 Email: info@oes.ie

Client **Country Clean Recycling Ltd.**

Title **Dust Monitoring Locations**

Scale. 1:1000 | Project No. 1094_03

Figure No. Figure 2 | Rev. 01

Attachment B
General Regulations

General Applications Regulations (2007)

The Safety, health and Welfare at Work (General Application) Regulations 2007 (S.I. No.299 of 2007) were introduced in November 2007. These regulations revoke the provisions of the Safety, Health and Welfare at Work (General Application) Regulations 1993. These regulations bring together a wide variety of previous legislation and directives into a single comprehensive document. For the purposes of this report the most significant part of this legislation is contained in Chapter 3 of Part 2 which refers to personal protective equipment (PPE)

Chapter 3 of Part 2 of the Regulations re transposes Directive 89/656/EC on the use of PPE aimed at protecting the safety and health of employees. The fundamental principle underlining these provisions is that PPE should only be used as a last resort. The health and safety of employees should be primarily safeguarded by reducing the risk at source by administrative, operational or engineering controls. Employers should provide protection on a collective basis rather than an individual basis. However if these controls measures are insufficient PPE must be used to protect against unavoidable hazards. Section 8 of the 2005 Safety, Health and Welfare at Work Act (S.I. No. of 2005) also places a duty on employers to provide PPE when risk cannot be reduced or adequately controlled.

Chapter 3 of Part 2 of the regulations also apply other duties for employees in respect of PPE, namely selection, assessment, conditions of use and compatibility, maintenance and replacement, information and training.

The primary duties of these Regulations are as follows:

Regulation 63: Assessment of PPE

This regulation states that employers must make an assessment of the hazards in the workplace to identify the correct type of PPE to be provided and to ensure that PPE is appropriate to the risk. The level of risk must be assessed so the performance required by the PPE can be determined. PPE selected should be capable of reaching the level of protection required. It is essential that employees are consulted and involved in the selection of PPE.

Regulation 64: Conditions of Use and Compatibility

In determining PPE to be used an employer must select appropriate PPE which is user friendly and fits the individual employee correctly, after adjustment if necessary.

Regulation 65: Personal Use

This regulation states that PPE should normally be provided for personal use only. However sometimes expensive PPE such as respirators may be used by more that one person. In these circumstances the employer should have provisions in place to clean and disinfect the PPE before it is used by another individual.

Regulation 66. Maintenance and Replacement

PPE must be checked regularly, by properly instructed staff, in accordance with the manufacturers' and suppliers' instructions, to ensure that it is in good working order before it is given to the wearer. A maintenance programme, especially on Respiratory protective equipment (RPE), should be set up. This should include the following,

- Cleaning and Disinfecting:
- Examination:
- Repair:
- Testing:
- Record keeping: Record keeping is especially important where there is a serious risk to safety and health, e.g. where RPE for use with toxic substances is specified.

Regulation 67: Information, Training and Instruction.

This regulation requires that where PPE is provided to employees they must be given suitable information, instruction and training to enable them to make proper use of the PPE provided. Employers should also insure that people are using the PPE properly by periodically checking that it is being used in accordance with the instruction or training in the use of PPE provided to employees.

The Role of Employees.

Employees should:

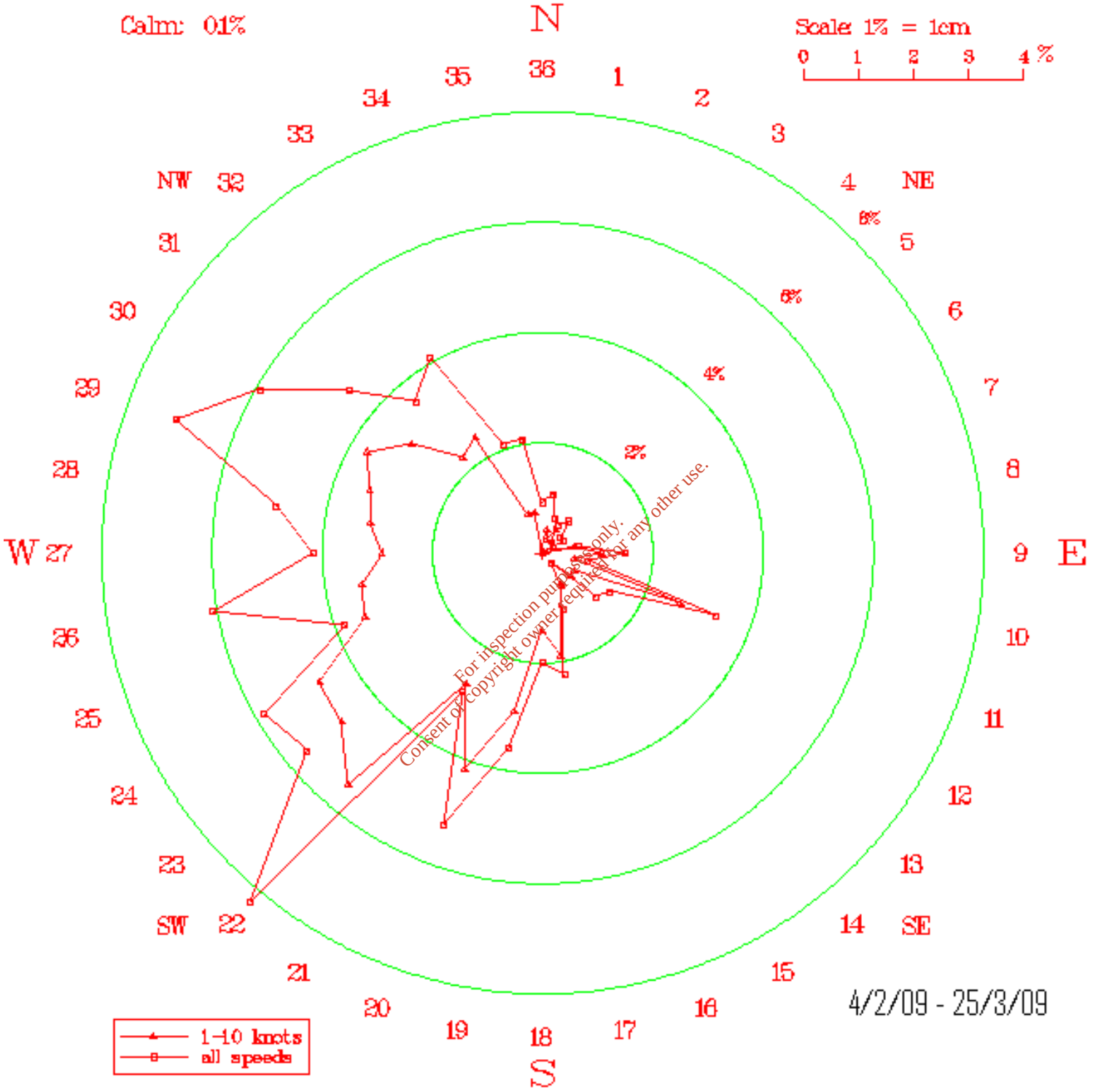
- Use PPE properly whenever it is required to be used:
- Report any defects in or damage to PPE immediately to their supervisor or employer:
- Participate in any training or instruction provided on PPE:
- Inform their employer of any medical conditions they have that might be affected by the use of the PPE provided:

In summary employees should assess the hazards to determine the appropriate PPE to use, employees should be consulted in PPE selection process and PPE selected should fit the employee properly. PPE should be only for individual use, with the exception of expensive equipment such as respirators. A maintenance and replacement programme should be in place and employees should be provided with instruction and training in PPE and its proper use. An overall PPE programme should be introduced to cover all of the above requirements it would also insure that all the requirements are fulfilled. Finally employees should be involved in all aspects of the PPE programme.

Attachment C
Cork Airport Meteorological Data

Cork Airport 2009

Percentage Frequency of Occurrence of Wind Directions



Percentage Frequency of Occurrence of Wind Speeds

+ less than 0.1

0	1-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	over 48 knots
+	12.1	25.9	29.3	26.6	5.7	0.3	0.0	0.0	0.0	0.0 %

mean wind speed: 8.6 knots standard deviation: 4.5 knots

anemometer height: 12m

Met Eireann, Glasnevin Hill, Dublin 9.

Cork Airport

Date and Hour	Wind Speed (knots)	Wind Direction (degrees)	Rainfall (mm)	Barometer Level Pressure (hPa)	Mean sea Level Pressure (hPa)
04/02/2009 00:00	2	10	0.0	966.3	986.2
04/02/2009 01:00	4	350	0.0	966.3	986.2
04/02/2009 02:00	5	30	0.0	966.2	986.1
04/02/2009 03:00	6	50	0.0	966.1	986
04/02/2009 04:00	2	50	0.0	966.2	986.1
04/02/2009 05:00	3	10	0.0	966.4	986.3
04/02/2009 06:00	7	30	0.0	966.5	986.5
04/02/2009 07:00	8	50	0.0	966.5	986.4
04/02/2009 08:00	7	60	0.0	967.2	987.1
04/02/2009 09:00	10	40	0.2	967.5	987.3
04/02/2009 10:00	9	60	0.6	968.2	987.9
04/02/2009 11:00	11	60	0.2	968.7	988.4
04/02/2009 12:00	13	50	0.5	969.2	988.8
04/02/2009 13:00	12	30	0.2	968.9	988.4
04/02/2009 14:00	17	50	0.0	968.6	988.1
04/02/2009 15:00	18	60	0.5	968.9	988.5
04/02/2009 16:00	16	40	0.3	968.9	988.5
04/02/2009 17:00	16	40	0.1	969.5	989.1
04/02/2009 18:00	16	40	0.0	970.1	989.7
04/02/2009 19:00	15	40	0.0	970.4	990
04/02/2009 20:00	14	40	0.0	970.8	990.5
04/02/2009 21:00	13	40	0.0	971	990.7
04/02/2009 22:00	13	20	0.0	970.9	990.6
04/02/2009 23:00	14	20	0.0	971.3	991
05/02/2009 00:00	16	20	0.0	971.7	991.5
05/02/2009 01:00	15	20	0.0	972.1	991.9
05/02/2009 02:00	16	10	0.0	972.2	992
05/02/2009 03:00	14	10	0.1	972.4	992.3
05/02/2009 04:00	14	10	0.0	972.1	992
05/02/2009 05:00	14	360	0.0	972.3	992.2
05/02/2009 06:00	14	360	0.0	972.5	992.4
05/02/2009 07:00	15	360	0.0	972.7	992.6
05/02/2009 08:00	19	360	0.0	973.3	993.2
05/02/2009 09:00	17	360	0.0	973.7	993.6
05/02/2009 10:00	18	350	0.0	974.2	994.1
05/02/2009 11:00	18	350	0.0	974.5	994.4
05/02/2009 12:00	19	360	0.0	974.6	994.4
05/02/2009 13:00	21	350	0.0	974.1	993.9
05/02/2009 14:00	20	350	0.0	974.2	994
05/02/2009 15:00	21	350	0.0	974.6	994.4
05/02/2009 16:00	19	350	0.0	974.8	994.6
05/02/2009 17:00	18	360	0.0	975.5	995.3
05/02/2009 18:00	18	360	0.0	976.4	996.3
05/02/2009 19:00	18	360	0.0	977	996.9
05/02/2009 20:00	17	350	0.0	977.3	997.2

05/02/2009 21:00	18	350	0.0	977.6	997.6
05/02/2009 22:00	13	340	0.0	978.1	998.1
05/02/2009 23:00	13	340	0.0	978.3	998.4
06/02/2009 00:00	12	340	0.0	978.7	998.8
06/02/2009 01:00	12	340	0.0	978.8	998.9
06/02/2009 02:00	13	350	0.0	978.7	998.8
06/02/2009 03:00	12	350	0.0	978.8	998.9
06/02/2009 04:00	15	350	0.0	978.3	998.3
06/02/2009 05:00	15	340	0.0	978.6	998.6
06/02/2009 06:00	15	330	0.0	978.4	998.4
06/02/2009 07:00	16	340	0.0	978.5	998.6
06/02/2009 08:00	10	350	0.0	979	999.1
06/02/2009 09:00	12	330	0.0	979.4	999.4
06/02/2009 10:00	12	330	0.0	979.7	999.7
06/02/2009 11:00	11	340	0.0	979.7	999.6
06/02/2009 12:00	13	330	0.0	979.7	999.5
06/02/2009 13:00	12	340	0.0	979.3	999
06/02/2009 14:00	13	350	0.0	979.2	998.9
06/02/2009 15:00	14	350	0.0	979.3	999
06/02/2009 16:00	13	350	0.0	979.6	999.3
06/02/2009 17:00	12	340	0.0	980.3	1000.1
06/02/2009 18:00	11	340	0.0	981	1000.9
06/02/2009 19:00	11	330	0.0	981.4	1001.4
06/02/2009 20:00	10	330	0.0	982	1002
06/02/2009 21:00	10	320	0.0	982.6	1002.6
06/02/2009 22:00	7	310	0.0	983	1003.1
06/02/2009 23:00	6	300	0.0	983.4	1003.5
07/02/2009 00:00	6	280	0.0	983.4	1003.6
07/02/2009 01:00	8	280	0.0	983.4	1003.6
07/02/2009 02:00	7	290	0.0	983.5	1003.7
07/02/2009 03:00	8	290	0.0	983.6	1003.7
07/02/2009 04:00	10	300	0.0	983.5	1003.6
07/02/2009 05:00	12	310	0.0	984.2	1004.3
07/02/2009 06:00	10	320	0.0	984.3	1004.4
07/02/2009 07:00	9	310	0.0	984.4	1004.5
07/02/2009 08:00	9	320	0.0	985	1005.1
07/02/2009 09:00	11	320	0.0	985.4	1005.5
07/02/2009 10:00	12	320	0.0	985.8	1005.8
07/02/2009 11:00	14	330	0.0	986.1	1006.1
07/02/2009 12:00	13	330	0.0	986.7	1006.6
07/02/2009 13:00	12	340	0.0	987	1006.9
07/02/2009 14:00	13	340	0.0	986.7	1006.6
07/02/2009 15:00	13	330	0.0	986.9	1006.8
07/02/2009 16:00	12	340	0.0	986.7	1006.6
07/02/2009 17:00	9	340	0.0	986.7	1006.6
07/02/2009 18:00	6	330	0.0	987	1007
07/02/2009 19:00	5	290	0.0	987.1	1007.2
07/02/2009 20:00	5	300	0.0	986.7	1006.8
07/02/2009 21:00	3	320	0.0	986.2	1006.3
07/02/2009 22:00	3	310	0.0	986	1006.1

07/02/2009 23:00	1	120	0.0	985.3	1005.4
08/02/2009 00:00	3	130	0.0	985	1005.1
08/02/2009 01:00	4	140	0.0	984.3	1004.4
08/02/2009 02:00	6	140	0.0	982.9	1003
08/02/2009 03:00	5	150	0.2	981.9	1002
08/02/2009 04:00	6	140	0.8	981	1001
08/02/2009 05:00	8	160	0.7	980.2	1000.1
08/02/2009 06:00	9	170	0.3	979.5	999.4
08/02/2009 07:00	7	170	0.3	979.5	999.3
08/02/2009 08:00	8	180	0.2	979	998.8
08/02/2009 09:00	6	180	0.6	978.6	998.3
08/02/2009 10:00	6	300	0.7	979.4	999.2
08/02/2009 11:00	5	280	0.0	979.8	999.5
08/02/2009 12:00	11	290	0.0	979.9	999.5
08/02/2009 13:00	13	290	0.0	980.1	999.6
08/02/2009 14:00	14	280	0.0	980.7	1000.2
08/02/2009 15:00	12	280	0.0	980.6	1000.1
08/02/2009 16:00	13	270	0.0	980.6	1000.1
08/02/2009 17:00	10	250	0.0	980.7	1000.4
08/02/2009 18:00	9	240	0.0	980.6	1000.4
08/02/2009 19:00	6	240	0.0	980.8	1000.6
08/02/2009 20:00	8	240	0.0	981.2	1001
08/02/2009 21:00	10	260	0.1	981.3	1001.1
08/02/2009 22:00	8	250	0.0	981.1	1001
08/02/2009 23:00	7	240	0.0	981	1000.9
09/02/2009 00:00	6	240	0.0	980.7	1000.6
09/02/2009 01:00	5	240	0.0	980.5	1000.4
09/02/2009 02:00	4	250	0.0	979.9	999.7
09/02/2009 03:00	2	240	0.0	979.4	999.2
09/02/2009 04:00	2	270	0.0	979.1	998.9
09/02/2009 05:00	3	320	0.0	978.1	998
09/02/2009 06:00	1	170	0.0	977.5	997.4
09/02/2009 07:00	4	40	0.0	976.2	996
09/02/2009 08:00	7	40	0.0	976.1	995.9
09/02/2009 09:00	7	30	0.0	975.5	995.3
09/02/2009 10:00	8	30	0.0	974.2	994
09/02/2009 11:00	9	20	0.0	973.9	993.6
09/02/2009 12:00	8	20	0.0	973.3	993
09/02/2009 13:00	9	30	0.0	972.7	992.3
09/02/2009 14:00	9	20	0.0	971.6	991.2
09/02/2009 15:00	11	20	0.0	970.7	990.3
09/02/2009 16:00	13	10	0.0	970.6	990.2
09/02/2009 17:00	15	10	0.0	970.8	990.4
09/02/2009 18:00	13	360	0.0	971.5	991.2
09/02/2009 19:00	12	340	0.0	972.8	992.5
09/02/2009 20:00	17	350	0.0	973.7	993.5
09/02/2009 21:00	12	340	0.0	974.7	994.5
09/02/2009 22:00	15	330	0.0	976.3	996.2
09/02/2009 23:00	14	330	0.0	977.9	997.8
10/02/2009 00:00	15	330	0.0	979.2	999.1

10/02/2009 01:00	12	320	0.0	980.5	1000.5
10/02/2009 02:00	11	320	0.0	981.5	1001.5
10/02/2009 03:00	10	310	0.0	982.4	1002.4
10/02/2009 04:00	10	300	0.0	983.3	1003.3
10/02/2009 05:00	9	290	0.0	984.7	1004.8
10/02/2009 06:00	6	290	0.0	985.3	1005.4
10/02/2009 07:00	4	280	0.0	986.1	1006.2
10/02/2009 08:00	5	260	0.0	986.8	1006.9
10/02/2009 09:00	8	270	0.0	988.1	1008.2
10/02/2009 10:00	7	270	0.0	988.8	1008.9
10/02/2009 11:00	12	280	0.0	990	1010
10/02/2009 12:00	12	280	0.0	991	1010.9
10/02/2009 13:00	13	290	0.1	991.9	1011.8
10/02/2009 14:00	13	290	0.0	992.4	1012.2
10/02/2009 15:00	16	300	0.5	993.1	1012.9
10/02/2009 16:00	11	300	0.3	993.8	1013.7
10/02/2009 17:00	13	300	0.0	994.6	1014.5
10/02/2009 18:00	8	290	0.0	995.3	1015.3
10/02/2009 19:00	7	260	0.0	995.6	1015.7
10/02/2009 20:00	7	250	0.0	995.7	1015.8
10/02/2009 21:00	7	240	0.0	995.9	1016
10/02/2009 22:00	6	240	0.0	996	1016.1
10/02/2009 23:00	6	230	0.0	996	1016.1
11/02/2009 00:00	7	240	0.0	996.2	1016.3
11/02/2009 01:00	7	240	0.0	996.7	1016.8
11/02/2009 02:00	6	250	0.0	997.1	1017.2
11/02/2009 03:00	6	250	0.0	996.9	1017
11/02/2009 04:00	6	240	0.0	997.1	1017.2
11/02/2009 05:00	6	250	0.0	997.2	1017.3
11/02/2009 06:00	4	250	0.0	997.4	1017.5
11/02/2009 07:00	3	280	0.0	997.7	1017.8
11/02/2009 08:00	4	280	0.0	998.4	1018.5
11/02/2009 09:00	4	300	0.0	999.2	1019.3
11/02/2009 10:00	3	300	0.0	999.5	1019.6
11/02/2009 11:00	5	300	0.0	1000.2	1020.3
11/02/2009 12:00	5	300	0.0	1000.8	1020.8
11/02/2009 13:00	4	300	0.0	1000.9	1020.9
11/02/2009 14:00	3	330	0.0	1001.2	1021.1
11/02/2009 15:00	4	290	0.0	1001.5	1021.4
11/02/2009 16:00	4	300	0.0	1001.9	1021.8
11/02/2009 17:00	4	310	0.0	1002.6	1022.6
11/02/2009 18:00	2	320	0.0	1003.2	1023.2
11/02/2009 19:00	3	320	0.0	1003.7	1023.7
11/02/2009 20:00	2	300	0.0	1004.1	1024.1
11/02/2009 21:00	4	320	0.0	1004.7	1024.8
11/02/2009 22:00	3	310	0.0	1005.1	1025.2
11/02/2009 23:00	3	300	0.0	1005.7	1025.8
12/02/2009 00:00	3	320	0.0	1006.3	1026.4
12/02/2009 01:00	1	330	0.0	1006.6	1026.8
12/02/2009 02:00	1	260	0.0	1006.5	1026.7

12/02/2009 03:00	1	210	0.2	1006.5	1026.7
12/02/2009 04:00	4	120	0.0	1005.9	1026.1
12/02/2009 05:00	5	110	0.0	1006.2	1026.4
12/02/2009 06:00	5	130	0.3	1006.2	1026.4
12/02/2009 07:00	3	160	0.1	1006.3	1026.5
12/02/2009 08:00	2	180	0.0	1006.4	1026.6
12/02/2009 09:00	3	210	0.0	1006.6	1026.8
12/02/2009 10:00	4	230	0.1	1006.9	1027
12/02/2009 11:00	5	240	0.0	1007	1027.1
12/02/2009 12:00	4	260	0.0	1006.9	1026.9
12/02/2009 13:00	4	260	0.0	1006.9	1026.8
12/02/2009 14:00	7	280	0.0	1006.7	1026.5
12/02/2009 15:00	8	280	0.0	1006.5	1026.3
12/02/2009 16:00	7	280	0.0	1006.3	1026.1
12/02/2009 17:00	6	270	0.0	1006.2	1026
12/02/2009 18:00	6	270	0.0	1006.3	1026.2
12/02/2009 19:00	5	280	0.0	1006.3	1026.2
12/02/2009 20:00	5	300	0.0	1006.5	1026.5
12/02/2009 21:00	5	300	0.0	1006.5	1026.5
12/02/2009 22:00	5	310	0.0	1006.5	1026.5
12/02/2009 23:00	5	300	0.0	1006.7	1026.7
13/02/2009 00:00	6	300	0.0	1006.7	1026.7
13/02/2009 01:00	6	270	0.0	1006.6	1026.6
13/02/2009 02:00	5	300	0.0	1006.3	1026.3
13/02/2009 03:00	6	310	0.0	1006.1	1026.2
13/02/2009 04:00	4	310	0.0	1005.9	1026
13/02/2009 05:00	4	310	0.0	1005.9	1026
13/02/2009 06:00	4	290	0.0	1005.8	1025.9
13/02/2009 07:00	4	280	0.0	1005.7	1025.7
13/02/2009 08:00	3	290	0.0	1006	1026
13/02/2009 09:00	5	320	0.0	1006.1	1026.2
13/02/2009 10:00	4	330	0.0	1006.2	1026.3
13/02/2009 11:00	3	330	0.0	1006.3	1026.3
13/02/2009 12:00	2	270	0.0	1006.3	1026.2
13/02/2009 13:00	3	270	0.0	1006.2	1026.1
13/02/2009 14:00	3	280	0.0	1006	1025.9
13/02/2009 15:00	2	230	0.0	1005.8	1025.7
13/02/2009 16:00	3	190	0.0	1005.7	1025.7
13/02/2009 17:00	4	190	0.0	1005.6	1025.6
13/02/2009 18:00	2	180	0.0	1005.6	1025.7
13/02/2009 19:00	3	180	0.0	1005.8	1025.9
13/02/2009 20:00	2	170	0.0	1006	1026.1
13/02/2009 21:00	1	190	0.0	1006	1026.1
13/02/2009 22:00	1	170	0.0	1006.1	1026.2
13/02/2009 23:00	2	190	0.0	1006.1	1026.2
14/02/2009 00:00	3	190	0.0	1006.2	1026.3
14/02/2009 01:00	3	170	0.0	1006.2	1026.3
14/02/2009 02:00	3	190	0.0	1006.2	1026.3
14/02/2009 03:00	3	200	0.0	1006.1	1026.3
14/02/2009 04:00	3	220	0.0	1006	1026.2

14/02/2009 05:00	4	190	0.0	1006	1026.1
14/02/2009 06:00	4	170	0.0	1006	1026.2
14/02/2009 07:00	3	200	0.0	1006.2	1026.4
14/02/2009 08:00	4	190	0.0	1006.6	1026.8
14/02/2009 09:00	4	200	0.0	1007.1	1027.2
14/02/2009 10:00	4	190	0.0	1007.3	1027.4
14/02/2009 11:00	3	200	0.0	1007.7	1027.8
14/02/2009 12:00	5	200	0.0	1007.8	1027.8
14/02/2009 13:00	7	210	0.0	1007.9	1027.9
14/02/2009 14:00	7	210	0.0	1007.6	1027.6
14/02/2009 15:00	8	210	0.0	1007.6	1027.6
14/02/2009 16:00	9	210	0.0	1007.6	1027.6
14/02/2009 17:00	7	210	0.0	1007.8	1027.8
14/02/2009 18:00	5	210	0.0	1008	1028.1
14/02/2009 19:00	5	220	0.0	1008.3	1028.4
14/02/2009 20:00	5	220	0.0	1008.4	1028.6
14/02/2009 21:00	5	220	0.0	1008.5	1028.7
14/02/2009 22:00	6	230	0.0	1008.8	1029
14/02/2009 23:00	7	230	0.0	1009	1029.2
15/02/2009 00:00	6	230	0.0	1009	1029.2
15/02/2009 01:00	5	240	0.0	1009.1	1029.3
15/02/2009 02:00	4	230	0.0	1008.8	1029
15/02/2009 03:00	3	200	0.0	1008.8	1029.1
15/02/2009 04:00	4	220	0.0	1008.6	1028.9
15/02/2009 05:00	5	230	0.0	1008.6	1028.9
15/02/2009 06:00	3	210	0.0	1008.7	1029.1
15/02/2009 07:00	3	220	0.0	1009	1029.3
15/02/2009 08:00	3	240	0.0	1009.3	1029.6
15/02/2009 09:00	3	250	0.0	1009.5	1029.8
15/02/2009 10:00	4	260	0.0	1009.5	1029.7
15/02/2009 11:00	7	230	0.1	1009.3	1029.4
15/02/2009 12:00	8	230	0.0	1009.7	1029.8
15/02/2009 13:00	8	240	0.0	1009.7	1029.7
15/02/2009 14:00	6	240	0.0	1009.1	1029.1
15/02/2009 15:00	7	240	0.0	1008.8	1028.8
15/02/2009 16:00	7	230	0.0	1008.6	1028.6
15/02/2009 17:00	6	210	0.0	1008.7	1028.7
15/02/2009 18:00	5	230	0.0	1009.1	1029.2
15/02/2009 19:00	5	250	0.0	1009.4	1029.6
15/02/2009 20:00	6	240	0.0	1009.2	1029.4
15/02/2009 21:00	5	250	0.0	1009.4	1029.6
15/02/2009 22:00	5	270	0.0	1009.4	1029.7
15/02/2009 23:00	3	260	0.0	1009.4	1029.7
16/02/2009 00:00	2	220	0.0	1009.4	1029.8
16/02/2009 01:00	2	230	0.0	1009.4	1029.8
16/02/2009 02:00	4	220	0.0	1009.2	1029.5
16/02/2009 03:00	3	190	0.0	1008.8	1029.1
16/02/2009 04:00	3	220	0.1	1008.8	1029.1
16/02/2009 05:00	2	190	0.0	1008.7	1028.9
16/02/2009 06:00	2	190	0.0	1008.8	1029.1

16/02/2009 07:00	1	10	0.1	1008.8	1029
16/02/2009 08:00	1	220	0.0	1008.8	1029
16/02/2009 09:00	3	200	0.0	1008.9	1029.1
16/02/2009 10:00	4	220	0.0	1009.2	1029.3
16/02/2009 11:00	7	220	0.0	1009.3	1029.4
16/02/2009 12:00	7	240	0.0	1009.4	1029.5
16/02/2009 13:00	8	240	0.0	1009.3	1029.4
16/02/2009 14:00	8	230	0.0	1009.3	1029.3
16/02/2009 15:00	7	240	0.0	1009.2	1029.2
16/02/2009 16:00	6	230	0.0	1009.4	1029.4
16/02/2009 17:00	5	240	0.0	1009.6	1029.7
16/02/2009 18:00	3	250	0.0	1009.7	1029.8
16/02/2009 19:00	4	260	0.0	1010.1	1030.2
16/02/2009 20:00	5	250	0.0	1010.1	1030.3
16/02/2009 21:00	6	240	0.0	1010.1	1030.4
16/02/2009 22:00	4	250	0.0	1010.2	1030.4
16/02/2009 23:00	5	280	0.0	1010.4	1030.7
17/02/2009 00:00	4	280	0.0	1010.4	1030.6
17/02/2009 01:00	4	260	0.0	1010.3	1030.5
17/02/2009 02:00	4	250	0.0	1010.3	1030.5
17/02/2009 03:00	5	250	0.0	1010.2	1030.4
17/02/2009 04:00	5	270	0.0	1009.9	1030.1
17/02/2009 05:00	4	270	0.0	1010.1	1030.3
17/02/2009 06:00	4	290	0.0	1010.4	1030.6
17/02/2009 07:00	4	300	0.0	1010.6	1030.8
17/02/2009 08:00	4	290	0.0	1011.1	1031.3
17/02/2009 09:00	3	280	0.0	1011.5	1031.7
17/02/2009 10:00	4	260	0.0	1011.6	1031.8
17/02/2009 11:00	4	250	0.0	1011.6	1031.7
17/02/2009 12:00	3	250	0.0	1011.6	1031.7
17/02/2009 13:00	4	240	0.0	1011.4	1031.5
17/02/2009 14:00	4	230	0.0	1011.3	1031.4
17/02/2009 15:00	4	210	0.0	1011.3	1031.4
17/02/2009 16:00	3	200	0.0	1011.2	1031.3
17/02/2009 17:00	2	200	0.0	1010.9	1031
17/02/2009 18:00	2	210	0.0	1011	1031.2
17/02/2009 19:00	3	230	0.0	1011	1031.2
17/02/2009 20:00	3	250	0.0	1010.9	1031.1
17/02/2009 21:00	3	270	0.0	1010.8	1031
17/02/2009 22:00	3	240	0.0	1010.6	1030.8
17/02/2009 23:00	1	220	0.0	1010.7	1030.9
18/02/2009 00:00	0	0	0.0	1010.4	1030.6
18/02/2009 01:00	2	190	0.0	1010.1	1030.3
18/02/2009 02:00	3	200	0.0	1009.8	1030.1
18/02/2009 03:00	3	200	0.0	1009.4	1029.7
18/02/2009 04:00	3	200	0.0	1008.7	1029
18/02/2009 05:00	3	200	0.0	1008.6	1028.8
18/02/2009 06:00	3	190	0.0	1008.5	1028.7
18/02/2009 07:00	3	220	0.0	1008.4	1028.6
18/02/2009 08:00	3	180	0.0	1008.4	1028.6

18/02/2009 09:00	3	170	0.0	1008.3	1028.5
18/02/2009 10:00	3	160	0.0	1008.2	1028.4
18/02/2009 11:00	5	150	0.0	1007.9	1028.1
18/02/2009 12:00	6	170	0.0	1007.7	1027.8
18/02/2009 13:00	5	180	0.0	1007.3	1027.4
18/02/2009 14:00	6	170	0.0	1007.1	1027.2
18/02/2009 15:00	7	170	0.0	1006.9	1027
18/02/2009 16:00	7	170	0.0	1006.8	1026.9
18/02/2009 17:00	7	170	0.2	1006.7	1026.8
18/02/2009 18:00	4	160	0.0	1006.6	1026.7
18/02/2009 19:00	4	150	0.0	1006.9	1027.1
18/02/2009 20:00	4	170	0.0	1007	1027.2
18/02/2009 21:00	3	170	0.0	1007.1	1027.3
18/02/2009 22:00	4	160	0.0	1007.1	1027.3
18/02/2009 23:00	4	170	0.0	1007.2	1027.4
19/02/2009 00:00	3	170	0.0	1007.4	1027.6
19/02/2009 01:00	2	170	0.0	1007.5	1027.7
19/02/2009 02:00	4	190	0.1	1007.6	1027.8
19/02/2009 03:00	3	200	0.0	1007.6	1027.8
19/02/2009 04:00	5	220	0.0	1007.7	1027.9
19/02/2009 05:00	5	220	0.0	1008.3	1028.5
19/02/2009 06:00	4	270	0.2	1008.6	1028.8
19/02/2009 07:00	3	250	0.0	1008.4	1028.6
19/02/2009 08:00	1	340	0.0	1008.8	1029
19/02/2009 09:00	3	280	0.0	1009.4	1029.6
19/02/2009 10:00	4	280	0.0	1009.5	1029.6
19/02/2009 11:00	7	280	0.0	1009.7	1029.8
19/02/2009 12:00	8	300	0.1	1009.6	1029.7
19/02/2009 13:00	8	340	0.0	1009.7	1029.7
19/02/2009 14:00	9	350	0.0	1009.5	1029.5
19/02/2009 15:00	7	330	0.0	1010	1030
19/02/2009 16:00	8	340	0.1	1010.2	1030.2
19/02/2009 17:00	8	350	0.0	1010.7	1030.7
19/02/2009 18:00	7	340	0.0	1010.9	1031
19/02/2009 19:00	7	360	0.0	1011.2	1031.4
19/02/2009 20:00	7	10	0.0	1011.4	1031.6
19/02/2009 21:00	5	340	0.0	1011.6	1031.9
19/02/2009 22:00	5	320	0.0	1011.8	1032.1
19/02/2009 23:00	4	300	0.0	1012	1032.4
20/02/2009 00:00	5	300	0.0	1012.3	1032.7
20/02/2009 01:00	5	330	0.0	1012.1	1032.5
20/02/2009 02:00	6	340	0.0	1012.2	1032.6
20/02/2009 03:00	5	330	0.0	1012.1	1032.6
20/02/2009 04:00	5	330	0.0	1012.1	1032.6
20/02/2009 05:00	4	350	0.0	1012	1032.4
20/02/2009 06:00	3	30	0.0	1012.2	1032.7
20/02/2009 07:00	5	310	0.0	1012.3	1032.8
20/02/2009 08:00	3	330	0.0	1012.9	1033.4
20/02/2009 09:00	1	350	0.0	1013	1033.4
20/02/2009 10:00	2	120	0.0	1013.1	1033.4

20/02/2009 11:00	3	130	0.0	1013.3	1033.4
20/02/2009 12:00	5	190	0.0	1013.7	1033.8
20/02/2009 13:00	5	180	0.0	1013.4	1033.5
20/02/2009 14:00	6	180	0.0	1013.6	1033.8
20/02/2009 15:00	7	210	0.0	1013.3	1033.4
20/02/2009 16:00	7	220	0.0	1013.4	1033.6
20/02/2009 17:00	6	220	0.0	1013.5	1033.8
20/02/2009 18:00	5	190	0.0	1013.7	1034.1
20/02/2009 19:00	5	220	0.0	1013.9	1034.4
20/02/2009 20:00	4	250	0.0	1014	1034.4
20/02/2009 21:00	4	290	0.0	1014.1	1034.5
20/02/2009 22:00	4	290	0.0	1014.4	1034.8
20/02/2009 23:00	4	310	0.0	1014.7	1035.1
21/02/2009 00:00	5	310	0.0	1014.9	1035.3
21/02/2009 01:00	3	280	0.0	1015.3	1035.7
21/02/2009 02:00	4	280	0.0	1015.1	1035.6
21/02/2009 03:00	4	270	0.0	1015	1035.5
21/02/2009 04:00	4	270	0.0	1014.7	1035.2
21/02/2009 05:00	5	280	0.0	1014.5	1035
21/02/2009 06:00	4	280	0.1	1014.4	1034.9
21/02/2009 07:00	4	270	0.0	1014.5	1034.9
21/02/2009 08:00	4	260	0.0	1015.1	1035.5
21/02/2009 09:00	5	250	0.0	1015.6	1036
21/02/2009 10:00	5	260	0.0	1015.7	1036
21/02/2009 11:00	4	290	0.0	1016.1	1036.4
21/02/2009 12:00	7	280	0.0	1015.9	1036.1
21/02/2009 13:00	8	260	0.0	1015.8	1035.9
21/02/2009 14:00	8	260	0.0	1015.3	1035.3
21/02/2009 15:00	9	260	0.0	1015.2	1035.2
21/02/2009 16:00	11	270	0.0	1015.1	1035.1
21/02/2009 17:00	9	270	0.0	1014.9	1035
21/02/2009 18:00	6	270	0.0	1014.7	1034.8
21/02/2009 19:00	6	240	0.0	1014.8	1035
21/02/2009 20:00	8	240	0.0	1014.8	1035
21/02/2009 21:00	7	240	0.0	1014.6	1034.9
21/02/2009 22:00	8	240	0.0	1014.5	1034.8
21/02/2009 23:00	7	240	0.0	1014.7	1035
22/02/2009 00:00	6	230	0.0	1014.7	1034.9
22/02/2009 01:00	6	230	0.0	1014.5	1034.8
22/02/2009 02:00	6	220	0.0	1014	1034.2
22/02/2009 03:00	6	240	0.0	1013.6	1033.8
22/02/2009 04:00	8	260	0.0	1013	1033.1
22/02/2009 05:00	8	250	0.0	1012.7	1032.8
22/02/2009 06:00	10	270	0.0	1012.7	1032.8
22/02/2009 07:00	11	280	0.0	1012.9	1033
22/02/2009 08:00	6	270	0.0	1013.3	1033.4
22/02/2009 09:00	7	280	0.0	1013.5	1033.6
22/02/2009 10:00	11	300	0.0	1013.9	1033.9
22/02/2009 11:00	11	300	0.0	1013.7	1033.7
22/02/2009 12:00	15	290	0.0	1013.7	1033.6

22/02/2009 13:00	17	300	0.0	1013.2	1033.1
22/02/2009 14:00	17	310	0.0	1012.8	1032.7
22/02/2009 15:00	16	310	0.0	1012.8	1032.7
22/02/2009 16:00	16	320	0.0	1012.7	1032.7
22/02/2009 17:00	14	310	0.0	1012.8	1032.9
22/02/2009 18:00	14	310	0.0	1012.9	1033
22/02/2009 19:00	9	310	0.0	1012.8	1032.9
22/02/2009 20:00	9	310	0.0	1012.8	1032.9
22/02/2009 21:00	6	310	0.0	1012.6	1032.7
22/02/2009 22:00	8	310	0.0	1012.6	1032.7
22/02/2009 23:00	9	320	0.0	1012.3	1032.4
23/02/2009 00:00	9	310	0.0	1011.8	1031.9
23/02/2009 01:00	7	300	0.0	1011.8	1031.9
23/02/2009 02:00	10	310	0.0	1011.1	1031.2
23/02/2009 03:00	9	300	0.0	1011	1031.1
23/02/2009 04:00	9	300	0.0	1010.4	1030.5
23/02/2009 05:00	8	300	0.0	1010.4	1030.5
23/02/2009 06:00	11	310	0.0	1010.2	1030.3
23/02/2009 07:00	11	320	0.0	1010.2	1030.3
23/02/2009 08:00	12	330	0.0	1009.9	1030
23/02/2009 09:00	11	330	0.0	1010.2	1030.3
23/02/2009 10:00	11	330	0.0	1010.3	1030.3
23/02/2009 11:00	11	310	0.0	1010.2	1030.2
23/02/2009 12:00	12	320	0.0	1010.1	1030
23/02/2009 13:00	11	320	0.0	1009.5	1029.4
23/02/2009 14:00	11	310	0.0	1009.5	1029.4
23/02/2009 15:00	10	320	0.0	1009	1028.9
23/02/2009 16:00	8	320	0.0	1008.8	1028.7
23/02/2009 17:00	9	330	0.0	1008.9	1028.9
23/02/2009 18:00	8	330	0.0	1009.1	1029.1
23/02/2009 19:00	7	330	0.0	1009.3	1029.3
23/02/2009 20:00	6	330	0.0	1009.3	1029.4
23/02/2009 21:00	5	320	0.0	1009.2	1029.3
23/02/2009 22:00	5	310	0.0	1009.1	1029.2
23/02/2009 23:00	6	310	0.1	1009.3	1029.4
24/02/2009 00:00	6	320	0.0	1009.4	1029.5
24/02/2009 01:00	5	310	0.0	1009.4	1029.5
24/02/2009 02:00	5	310	0.0	1009.3	1029.4
24/02/2009 03:00	5	310	0.0	1008.8	1028.9
24/02/2009 04:00	5	320	0.0	1008.5	1028.6
24/02/2009 05:00	5	310	0.0	1008.5	1028.6
24/02/2009 06:00	4	330	0.0	1008.4	1028.5
24/02/2009 07:00	4	330	0.0	1008.5	1028.6
24/02/2009 08:00	3	320	0.0	1008.7	1028.9
24/02/2009 09:00	4	330	0.0	1008.9	1029
24/02/2009 10:00	4	320	0.0	1009.3	1029.4
24/02/2009 11:00	4	310	0.0	1009.5	1029.6
24/02/2009 12:00	3	320	0.0	1009.6	1029.6
24/02/2009 13:00	4	300	0.0	1009.4	1029.4
24/02/2009 14:00	4	300	0.0	1008.9	1028.9

24/02/2009 15:00	4	300	0.0	1008.8	1028.8
24/02/2009 16:00	4	300	0.0	1008.4	1028.4
24/02/2009 17:00	2	300	0.0	1008.4	1028.4
24/02/2009 18:00	2	300	0.0	1008.6	1028.7
24/02/2009 19:00	1	250	0.0	1008.9	1029
24/02/2009 20:00	2	220	0.0	1008.8	1028.9
24/02/2009 21:00	3	230	0.0	1009.2	1029.3
24/02/2009 22:00	4	250	0.0	1009.5	1029.6
24/02/2009 23:00	5	250	0.0	1009.6	1029.7
25/02/2009 00:00	3	220	0.0	1009.6	1029.8
25/02/2009 01:00	3	230	0.0	1009.6	1029.8
25/02/2009 02:00	2	280	0.0	1009.3	1029.5
25/02/2009 03:00	2	210	0.0	1009	1029.2
25/02/2009 04:00	2	200	0.0	1008.6	1028.8
25/02/2009 05:00	5	210	0.0	1008.8	1029
25/02/2009 06:00	5	230	0.0	1009.3	1029.5
25/02/2009 07:00	5	210	0.0	1009.2	1029.5
25/02/2009 08:00	5	220	0.0	1009.5	1029.8
25/02/2009 09:00	6	230	0.0	1009.9	1030.1
25/02/2009 10:00	8	230	0.0	1010.1	1030.3
25/02/2009 11:00	6	220	0.0	1010.3	1030.3
25/02/2009 12:00	8	240	0.0	1010.1	1030.1
25/02/2009 13:00	8	270	0.0	1009.7	1029.7
25/02/2009 14:00	7	290	0.0	1009.4	1029.4
25/02/2009 15:00	6	320	0.2	1009	1029
25/02/2009 16:00	7	270	0.0	1008.5	1028.4
25/02/2009 17:00	9	300	0.0	1008.7	1028.7
25/02/2009 18:00	9	330	0.0	1009	1029.1
25/02/2009 19:00	7	310	0.0	1009.9	1030
25/02/2009 20:00	3	280	0.0	1009.4	1029.6
25/02/2009 21:00	4	280	0.0	1009.7	1029.9
25/02/2009 22:00	5	270	0.0	1009.9	1030.2
25/02/2009 23:00	4	280	0.0	1009.6	1029.9
26/02/2009 00:00	4	270	0.0	1009.4	1029.8
26/02/2009 01:00	3	270	0.0	1008.9	1029.2
26/02/2009 02:00	4	240	0.0	1008.7	1029
26/02/2009 03:00	5	290	0.0	1008.6	1028.9
26/02/2009 04:00	5	290	0.0	1008	1028.3
26/02/2009 05:00	4	290	0.0	1007.8	1028.1
26/02/2009 06:00	7	260	0.0	1007.8	1028.1
26/02/2009 07:00	5	240	0.0	1007.5	1027.8
26/02/2009 08:00	5	230	0.0	1007.3	1027.6
26/02/2009 09:00	6	220	0.0	1007.3	1027.5
26/02/2009 10:00	7	220	0.0	1007.3	1027.4
26/02/2009 11:00	8	230	0.0	1007.1	1027.1
26/02/2009 12:00	8	220	0.0	1007.1	1027.1
26/02/2009 13:00	10	230	0.0	1006.5	1026.4
26/02/2009 14:00	9	230	0.0	1006	1025.9
26/02/2009 15:00	10	240	0.0	1005.4	1025.2
26/02/2009 16:00	11	240	0.0	1005.1	1024.9

26/02/2009 17:00	11	260	0.0	1005.1	1024.9
26/02/2009 18:00	10	260	0.0	1004.9	1024.8
26/02/2009 19:00	9	240	0.0	1004.8	1024.8
26/02/2009 20:00	7	210	0.0	1004.9	1025
26/02/2009 21:00	9	230	0.0	1004.2	1024.2
26/02/2009 22:00	8	220	0.0	1004.1	1024.2
26/02/2009 23:00	8	230	0.0	1004.1	1024.1
27/02/2009 00:00	7	220	0.0	1003.9	1023.9
27/02/2009 01:00	8	230	0.0	1004	1024
27/02/2009 02:00	8	230	0.0	1003.7	1023.7
27/02/2009 03:00	8	230	0.0	1003.3	1023.4
27/02/2009 04:00	7	210	0.0	1002.7	1022.7
27/02/2009 05:00	6	220	0.0	1002.2	1022.2
27/02/2009 06:00	6	200	0.0	1002.1	1022.1
27/02/2009 07:00	7	220	0.1	1001.7	1021.7
27/02/2009 08:00	8	220	0.0	1001.6	1021.6
27/02/2009 09:00	6	210	0.0	1001.4	1021.4
27/02/2009 10:00	7	220	0.0	1001.4	1021.4
27/02/2009 11:00	7	200	0.0	1001.3	1021.3
27/02/2009 12:00	8	200	0.2	1001	1020.9
27/02/2009 13:00	14	220	0.0	1000.5	1020.4
27/02/2009 14:00	13	200	0.0	999.8	1019.7
27/02/2009 15:00	14	210	0.1	999.2	1019.1
27/02/2009 16:00	12	200	0.2	998.5	1018.4
27/02/2009 17:00	10	200	0.0	997.9	1017.8
27/02/2009 18:00	9	200	0.2	997.7	1017.6
27/02/2009 19:00	8	200	0.4	997.5	1017.4
27/02/2009 20:00	7	190	0.1	997.1	1017
27/02/2009 21:00	7	200	0.0	996.6	1016.5
27/02/2009 22:00	7	200	0.0	996.4	1016.3
27/02/2009 23:00	6	200	0.0	996	1015.9
28/02/2009 00:00	7	200	0.0	995.4	1015.2
28/02/2009 01:00	8	190	0.0	994.9	1014.7
28/02/2009 02:00	9	190	0.0	994	1013.8
28/02/2009 03:00	10	200	0.0	993.4	1013.2
28/02/2009 04:00	10	200	0.0	992.4	1012.2
28/02/2009 05:00	10	200	0.0	992.2	1012
28/02/2009 06:00	11	190	0.0	991.7	1011.5
28/02/2009 07:00	11	200	0.0	991.4	1011.2
28/02/2009 08:00	10	190	0.0	991.3	1011.1
28/02/2009 09:00	10	200	0.0	991.1	1010.8
28/02/2009 10:00	11	180	0.1	990.7	1010.4
28/02/2009 11:00	11	180	0.0	990.2	1009.9
28/02/2009 12:00	12	180	0.0	989.8	1009.5
28/02/2009 13:00	12	190	0.2	989.1	1008.8
28/02/2009 14:00	13	200	0.0	988.6	1008.2
28/02/2009 15:00	12	190	0.0	988	1007.6
28/02/2009 16:00	12	190	0.0	987.6	1007.2
28/02/2009 17:00	12	200	0.0	987.4	1007
28/02/2009 18:00	10	190	0.0	987.3	1007

28/02/2009 19:00	9	180	0.2	987.1	1006.8
28/02/2009 20:00	8	200	1.4	987.2	1006.9
28/02/2009 21:00	4	290	0.3	987.3	1007
28/02/2009 22:00	5	270	0.0	987.3	1007.1
28/02/2009 23:00	5	230	0.0	987.5	1007.3
01/03/2009 00:00	6	240	0.1	987.5	1007.4
01/03/2009 01:00	6	220	0.0	987.3	1007.3
01/03/2009 02:00	6	220	0.0	987.2	1007.2
01/03/2009 03:00	6	220	0.0	987	1007
01/03/2009 04:00	5	270	0.1	987.3	1007.3
01/03/2009 05:00	5	260	0.0	987.6	1007.6
01/03/2009 06:00	4	260	0.0	988	1008
01/03/2009 07:00	5	260	0.0	988.5	1008.5
01/03/2009 08:00	7	270	0.0	989.2	1009.2
01/03/2009 09:00	8	290	0.1	989.9	1009.8
01/03/2009 10:00	11	290	0.0	990.5	1010.3
01/03/2009 11:00	13	290	0.0	991	1010.7
01/03/2009 12:00	16	290	0.0	991.4	1011.1
01/03/2009 13:00	16	290	0.0	991.7	1011.4
01/03/2009 14:00	15	290	0.0	992.4	1012.1
01/03/2009 15:00	14	300	0.0	992.7	1012.4
01/03/2009 16:00	15	300	0.0	993	1012.7
01/03/2009 17:00	12	300	0.0	993.4	1013.2
01/03/2009 18:00	12	290	0.0	994.5	1014.4
01/03/2009 19:00	7	280	0.0	995.3	1015.3
01/03/2009 20:00	11	310	0.0	996.1	1016.1
01/03/2009 21:00	8	290	0.0	996.8	1016.8
01/03/2009 22:00	9	300	0.0	997.2	1017.2
01/03/2009 23:00	10	300	0.0	997.4	1017.5
02/03/2009 00:00	9	290	0.0	997.7	1017.8
02/03/2009 01:00	4	240	0.0	997.9	1018.1
02/03/2009 02:00	3	210	0.0	998	1018.4
02/03/2009 03:00	3	220	0.0	997.9	1018.1
02/03/2009 04:00	3	230	0.0	997.9	1018.1
02/03/2009 05:00	6	260	0.0	997.7	1017.8
02/03/2009 06:00	6	230	0.0	998	1018.2
02/03/2009 07:00	3	240	0.0	998.1	1018.3
02/03/2009 08:00	3	210	0.0	998.3	1018.4
02/03/2009 09:00	5	210	0.0	998.3	1018.4
02/03/2009 10:00	8	230	0.0	998.1	1018
02/03/2009 11:00	8	240	0.0	998	1017.9
02/03/2009 12:00	8	220	0.0	997.9	1017.8
02/03/2009 13:00	9	220	0.0	997.2	1016.9
02/03/2009 14:00	11	240	0.0	996.7	1016.4
02/03/2009 15:00	11	260	0.0	996.2	1015.9
02/03/2009 16:00	10	240	0.0	995.8	1015.5
02/03/2009 17:00	10	260	0.0	995.4	1015.1
02/03/2009 18:00	8	230	0.0	995.3	1015.1
02/03/2009 19:00	8	230	0.1	995.6	1015.4
02/03/2009 20:00	5	240	0.0	995.3	1015.1

02/03/2009 21:00	6	250	0.0	995	1014.8
02/03/2009 22:00	6	250	0.0	994.7	1014.6
02/03/2009 23:00	6	230	0.0	994.7	1014.6
03/03/2009 00:00	6	230	0.0	993.9	1013.9
03/03/2009 01:00	6	220	0.0	993	1013.1
03/03/2009 02:00	7	220	0.0	992	1012
03/03/2009 03:00	7	210	0.0	990.7	1010.7
03/03/2009 04:00	7	220	0.0	989.4	1009.3
03/03/2009 05:00	5	200	0.0	987.9	1007.8
03/03/2009 06:00	6	220	0.0	986.2	1006
03/03/2009 07:00	8	210	0.0	984.7	1004.5
03/03/2009 08:00	10	220	0.0	982.8	1002.5
03/03/2009 09:00	10	200	0.2	980.8	1000.5
03/03/2009 10:00	13	200	0.2	978.5	998.1
03/03/2009 11:00	14	190	0.1	975.5	995
03/03/2009 12:00	14	190	2.5	971.4	990.9
03/03/2009 13:00	18	220	4.2	968.8	988.3
03/03/2009 14:00	18	290	1.8	968.5	988.1
03/03/2009 15:00	19	290	0.0	967.9	987.3
03/03/2009 16:00	15	280	0.2	967.2	986.7
03/03/2009 17:00	16	270	0.0	967	986.5
03/03/2009 18:00	15	280	0.1	967.2	986.8
03/03/2009 19:00	12	280	0.0	966.9	986.5
03/03/2009 20:00	10	260	0.0	966.6	986.3
03/03/2009 21:00	7	240	0.0	966.4	986.2
03/03/2009 22:00	7	250	0.0	965.9	985.7
03/03/2009 23:00	7	240	0.0	965.5	985.3
04/03/2009 00:00	7	260	0.2	965.2	985
04/03/2009 01:00	9	260	0.0	965.1	984.9
04/03/2009 02:00	9	280	0.0	964.7	984.5
04/03/2009 03:00	11	260	0.0	964.4	984.2
04/03/2009 04:00	10	260	0.0	963.7	983.4
04/03/2009 05:00	13	280	0.0	964.1	983.8
04/03/2009 06:00	9	250	0.1	963.8	983.6
04/03/2009 07:00	12	270	0.9	964.2	984
04/03/2009 08:00	11	270	0.0	963.9	983.6
04/03/2009 09:00	12	260	0.5	963.9	983.6
04/03/2009 10:00	11	270	1.1	964.9	984.6
04/03/2009 11:00	12	270	0.0	965.3	984.9
04/03/2009 12:00	12	290	0.2	965.8	985.4
04/03/2009 13:00	13	280	0.0	965.4	984.8
04/03/2009 14:00	9	270	0.0	964.8	984.3
04/03/2009 15:00	13	260	0.2	963.8	983.3
04/03/2009 16:00	10	230	0.1	962.9	982.4
04/03/2009 17:00	11	260	0.7	962	981.5
04/03/2009 18:00	10	250	0.7	961.8	981.3
04/03/2009 19:00	7	240	0.3	960.9	980.4
04/03/2009 20:00	10	250	1.7	961.9	981.5
04/03/2009 21:00	13	300	0.2	963	982.6
04/03/2009 22:00	12	310	0.0	964.2	983.8

04/03/2009 23:00	18	320	0.0	965.5	985.1
05/03/2009 00:00	14	330	0.0	967.1	986.8
05/03/2009 01:00	14	330	0.0	968.4	988.1
05/03/2009 02:00	14	320	0.0	970	989.8
05/03/2009 03:00	14	310	0.0	971.2	991
05/03/2009 04:00	11	310	0.0	972.5	992.4
05/03/2009 05:00	9	300	0.0	973.9	993.8
05/03/2009 06:00	9	290	0.0	974.8	994.7
05/03/2009 07:00	8	310	0.0	975.5	995.3
05/03/2009 08:00	12	320	0.0	976.8	996.6
05/03/2009 09:00	14	320	0.0	978.7	998.4
05/03/2009 10:00	11	320	0.0	979.7	999.4
05/03/2009 11:00	14	320	0.0	980.5	1000.1
05/03/2009 12:00	14	320	0.0	981.2	1000.7
05/03/2009 13:00	15	320	0.0	981.8	1001.3
05/03/2009 14:00	16	310	0.0	982.1	1001.6
05/03/2009 15:00	18	290	0.0	982.7	1002.4
05/03/2009 16:00	14	290	0.0	982.8	1002.4
05/03/2009 17:00	13	290	0.0	983.5	1003.2
05/03/2009 18:00	13	290	0.0	984.4	1004.2
05/03/2009 19:00	6	290	0.0	984.8	1004.7
05/03/2009 20:00	6	290	0.0	985.5	1005.4
05/03/2009 21:00	7	290	0.0	985.5	1005.4
05/03/2009 22:00	5	280	0.0	985.7	1005.6
05/03/2009 23:00	5	270	0.0	986.3	1006.2
06/03/2009 00:00	4	270	0.0	986.1	1006
06/03/2009 01:00	3	240	0.0	985.9	1005.9
06/03/2009 02:00	3	220	0.0	985.9	1005.8
06/03/2009 03:00	3	200	0.0	984.9	1004.9
06/03/2009 04:00	3	210	0.0	985.4	1005.4
06/03/2009 05:00	4	220	0.4	985.1	1005
06/03/2009 06:00	4	230	0.6	984.3	1004.2
06/03/2009 07:00	3	150	0.1	984.8	1004.7
06/03/2009 08:00	6	150	0.4	984.3	1004.1
06/03/2009 09:00	7	150	0.6	984.3	1004
06/03/2009 10:00	8	170	0.5	984.5	1004.2
06/03/2009 11:00	8	160	0.3	984.5	1004.1
06/03/2009 12:00	5	180	0.2	984.9	1004.5
06/03/2009 13:00	8	280	0.0	985	1004.5
06/03/2009 14:00	16	300	0.1	985.4	1004.8
06/03/2009 15:00	20	300	0.0	985.7	1005.1
06/03/2009 16:00	20	300	0.0	986.2	1005.6
06/03/2009 17:00	16	300	0.0	987.3	1006.8
06/03/2009 18:00	16	300	0.0	988.1	1007.7
06/03/2009 19:00	13	300	0.0	989.1	1008.7
06/03/2009 20:00	11	290	0.0	990	1009.7
06/03/2009 21:00	10	290	0.0	990.5	1010.2
06/03/2009 22:00	7	260	0.0	991	1010.7
06/03/2009 23:00	5	250	0.0	991.4	1011.2
07/03/2009 00:00	6	250	0.0	991.8	1011.6

07/03/2009 01:00	7	220	0.0	992	1012
07/03/2009 02:00	7	220	0.0	991.8	1011.7
07/03/2009 03:00	6	210	0.0	991.9	1011.9
07/03/2009 04:00	5	210	0.0	991	1011
07/03/2009 05:00	5	200	0.0	990.5	1010.4
07/03/2009 06:00	8	220	0.0	990.3	1010.1
07/03/2009 07:00	7	200	0.0	989.8	1009.6
07/03/2009 08:00	8	190	0.0	989.5	1009.2
07/03/2009 09:00	10	220	0.0	988.5	1008.1
07/03/2009 10:00	12	220	0.0	988.5	1008
07/03/2009 11:00	15	230	0.1	987.9	1007.3
07/03/2009 12:00	16	230	0.0	987.8	1007.2
07/03/2009 13:00	15	230	0.0	986.9	1006.3
07/03/2009 14:00	17	220	0.0	985.6	1005
07/03/2009 15:00	18	220	0.2	985	1004.4
07/03/2009 16:00	16	220	0.4	983.6	1003
07/03/2009 17:00	20	220	0.3	982.3	1001.7
07/03/2009 18:00	21	220	0.5	982.3	1001.7
07/03/2009 19:00	19	240	0.1	982.4	1001.8
07/03/2009 20:00	19	230	0.4	982.4	1001.9
07/03/2009 21:00	19	260	0.0	983	1002.6
07/03/2009 22:00	17	260	0.0	983.9	1003.6
07/03/2009 23:00	19	260	0.0	984.9	1004.7
08/03/2009 00:00	16	260	0.0	985.3	1005.2
08/03/2009 01:00	14	260	0.0	985.5	1005.4
08/03/2009 02:00	15	250	0.1	985.7	1005.6
08/03/2009 03:00	14	240	0.0	985.6	1005.5
08/03/2009 04:00	13	250	0.1	985	1005
08/03/2009 05:00	12	220	0.0	983.8	1003.8
08/03/2009 06:00	15	230	1.4	983.3	1003.3
08/03/2009 07:00	14	220	0.4	982.3	1002.3
08/03/2009 08:00	17	240	0.3	982	1001.9
08/03/2009 09:00	17	260	0.2	982.3	1002.1
08/03/2009 10:00	16	250	0.5	982.8	1002.7
08/03/2009 11:00	20	250	0.0	983.6	1003.4
08/03/2009 12:00	20	260	0.0	984	1003.8
08/03/2009 13:00	19	260	0.2	983.7	1003.6
08/03/2009 14:00	16	240	0.7	983.4	1003.3
08/03/2009 15:00	16	280	0.8	984.9	1004.8
08/03/2009 16:00	17	270	0.0	985.4	1005.2
08/03/2009 17:00	17	270	0.0	986.1	1005.9
08/03/2009 18:00	15	260	0.1	987	1006.9
08/03/2009 19:00	11	260	0.0	987.8	1007.7
08/03/2009 20:00	12	260	0.0	989.2	1009.2
08/03/2009 21:00	11	260	0.0	989.8	1009.8
08/03/2009 22:00	10	260	0.0	990.5	1010.6
08/03/2009 23:00	7	230	0.0	991	1011.2
09/03/2009 00:00	12	260	0.0	991.3	1011.4
09/03/2009 01:00	14	240	0.0	991.5	1011.6
09/03/2009 02:00	17	260	0.0	992.3	1012.4

09/03/2009 03:00	11	260	0.0	992.4	1012.4
09/03/2009 04:00	9	230	0.4	992.7	1012.9
09/03/2009 05:00	12	260	0.0	992.8	1012.9
09/03/2009 06:00	12	250	0.0	993.5	1013.6
09/03/2009 07:00	9	250	0.0	994	1014.1
09/03/2009 08:00	9	240	0.0	994.2	1014.3
09/03/2009 09:00	11	240	0.0	994.6	1014.6
09/03/2009 10:00	12	260	0.0	994.9	1014.8
09/03/2009 11:00	9	220	0.0	994.9	1014.7
09/03/2009 12:00	11	230	0.0	995.1	1015
09/03/2009 13:00	12	240	0.0	994.7	1014.5
09/03/2009 14:00	11	240	0.0	993.7	1013.5
09/03/2009 15:00	13	240	0.2	993.1	1012.8
09/03/2009 16:00	13	230	0.0	992.5	1012.3
09/03/2009 17:00	12	220	0.1	991.5	1011.3
09/03/2009 18:00	13	200	0.1	990.1	1009.9
09/03/2009 19:00	16	200	0.8	988.9	1008.6
09/03/2009 20:00	18	200	1.5	987.8	1007.5
09/03/2009 21:00	17	220	1.1	986.9	1006.5
09/03/2009 22:00	15	220	0.1	986.6	1006.2
09/03/2009 23:00	11	230	0.0	986.4	1006
10/03/2009 00:00	12	230	0.1	986.3	1005.9
10/03/2009 01:00	13	240	0.0	986.5	1006.1
10/03/2009 02:00	12	260	0.0	986.8	1006.4
10/03/2009 03:00	11	270	0.0	987.6	1007.2
10/03/2009 04:00	14	260	0.0	987.2	1006.9
10/03/2009 05:00	12	260	0.1	988.3	1008
10/03/2009 06:00	11	260	0.0	989.1	1008.8
10/03/2009 07:00	12	270	0.0	990.1	1009.8
10/03/2009 08:00	10	290	0.0	991	1010.7
10/03/2009 09:00	12	280	0.0	991.6	1011.3
10/03/2009 10:00	12	260	0.0	993	1012.7
10/03/2009 11:00	12	290	0.0	993.9	1013.5
10/03/2009 12:00	11	280	0.0	994.9	1014.6
10/03/2009 13:00	10	280	0.0	995.6	1015.3
10/03/2009 14:00	10	300	0.0	995.8	1015.4
10/03/2009 15:00	12	290	0.0	996.3	1015.9
10/03/2009 16:00	10	290	0.0	996.7	1016.3
10/03/2009 17:00	8	320	0.0	997.3	1016.9
10/03/2009 18:00	2	320	0.0	997.9	1017.6
10/03/2009 19:00	1	300	0.0	998.7	1018.5
10/03/2009 20:00	3	210	0.0	999.4	1019.3
10/03/2009 21:00	4	230	0.1	999.2	1019.1
10/03/2009 22:00	3	220	0.0	999.6	1019.4
10/03/2009 23:00	4	210	0.1	999.9	1019.8
11/03/2009 00:00	3	190	0.0	1000.3	1020.2
11/03/2009 01:00	3	160	0.0	1000.2	1020
11/03/2009 02:00	3	200	0.0	1000.3	1020.1
11/03/2009 03:00	5	220	0.0	999.9	1019.7
11/03/2009 04:00	9	220	0.1	1000	1019.8

11/03/2009 05:00	9	220	0.0	1000	1019.8
11/03/2009 06:00	10	230	0.0	1000.5	1020.3
11/03/2009 07:00	5	240	0.0	1000.6	1020.4
11/03/2009 08:00	4	220	0.0	1001	1020.8
11/03/2009 09:00	6	200	0.0	1001.2	1021
11/03/2009 10:00	10	220	0.0	1001.2	1020.9
11/03/2009 11:00	10	220	0.0	1001.5	1021.2
11/03/2009 12:00	10	220	0.0	1001.5	1021.1
11/03/2009 13:00	13	220	0.0	1001.6	1021.3
11/03/2009 14:00	14	220	0.0	1001	1020.6
11/03/2009 15:00	16	220	0.0	1000.4	1020
11/03/2009 16:00	14	220	0.0	1000.4	1020.1
11/03/2009 17:00	14	220	0.0	1000.1	1019.8
11/03/2009 18:00	13	220	0.0	1000.5	1020.3
11/03/2009 19:00	15	220	0.0	1000.3	1020.1
11/03/2009 20:00	15	220	0.1	1000	1019.8
11/03/2009 21:00	15	220	0.0	1000.1	1019.9
11/03/2009 22:00	15	220	0.0	1000.1	1019.9
11/03/2009 23:00	15	220	0.0	1000.4	1020.2
12/03/2009 00:00	14	220	0.0	999.8	1019.6
12/03/2009 01:00	14	220	0.0	999.7	1019.5
12/03/2009 02:00	13	220	0.1	999.8	1019.6
12/03/2009 03:00	12	220	0.0	999.7	1019.5
12/03/2009 04:00	11	220	0.1	999.7	1019.5
12/03/2009 05:00	10	240	0.1	999.8	1019.6
12/03/2009 06:00	9	250	0.2	1000.2	1020
12/03/2009 07:00	8	260	0.0	1000.6	1020.4
12/03/2009 08:00	4	240	0.0	1001	1020.8
12/03/2009 09:00	6	230	0.0	1001.5	1021.3
12/03/2009 10:00	8	240	0.0	1001.8	1021.6
12/03/2009 11:00	8	240	0.0	1002	1021.7
12/03/2009 12:00	8	220	0.0	1001.9	1021.6
12/03/2009 13:00	9	230	0.0	1001.9	1021.6
12/03/2009 14:00	9	240	0.0	1001.6	1021.3
12/03/2009 15:00	8	240	0.0	1001.3	1020.9
12/03/2009 16:00	7	230	0.0	1001.1	1020.8
12/03/2009 17:00	9	210	0.0	1001.1	1020.8
12/03/2009 18:00	6	200	0.0	1001.2	1021
12/03/2009 19:00	8	220	0.0	1001.3	1021.1
12/03/2009 20:00	9	220	0.0	1001.6	1021.5
12/03/2009 21:00	9	220	0.0	1001.3	1021.2
12/03/2009 22:00	8	210	0.0	1001.2	1021.1
12/03/2009 23:00	8	210	0.0	1000.8	1020.7
13/03/2009 00:00	8	200	0.0	1000.6	1020.5
13/03/2009 01:00	7	200	0.0	1000.3	1020.2
13/03/2009 02:00	6	190	0.1	999.6	1019.5
13/03/2009 03:00	8	190	0.0	998.8	1018.7
13/03/2009 04:00	5	180	0.0	998	1017.9
13/03/2009 05:00	5	160	0.0	997.5	1017.4
13/03/2009 06:00	7	160	0.0	996.9	1016.8

13/03/2009 07:00	9	170	0.0	996.5	1016.3
13/03/2009 08:00	12	170	0.1	995.8	1015.6
13/03/2009 09:00	12	170	0.0	995.2	1015
13/03/2009 10:00	12	170	0.0	994.8	1014.6
13/03/2009 11:00	13	180	0.1	994.5	1014.2
13/03/2009 12:00	16	180	0.0	993.9	1013.6
13/03/2009 13:00	17	170	0.0	992.3	1012
13/03/2009 14:00	13	160	0.0	991.7	1011.4
13/03/2009 15:00	15	180	0.3	990.7	1010.4
13/03/2009 16:00	15	180	0.3	989.6	1009.3
13/03/2009 17:00	17	190	0.4	988.5	1008.1
13/03/2009 18:00	18	200	0.5	987.6	1007.2
13/03/2009 19:00	19	200	0.4	987.9	1007.5
13/03/2009 20:00	15	220	0.0	988.1	1007.7
13/03/2009 21:00	13	220	0.6	988.5	1008.1
13/03/2009 22:00	11	220	0.7	989	1008.7
13/03/2009 23:00	13	240	0.1	989.6	1009.3
14/03/2009 00:00	13	260	0.0	990.5	1010.2
14/03/2009 01:00	12	260	0.0	991.7	1011.5
14/03/2009 02:00	9	250	0.2	992.4	1012.2
14/03/2009 03:00	10	260	0.1	993.5	1013.4
14/03/2009 04:00	10	260	0.0	994.2	1014.1
14/03/2009 05:00	8	250	0.0	995.4	1015.3
14/03/2009 06:00	8	270	0.0	996.5	1016.5
14/03/2009 07:00	8	260	0.0	997.4	1017.4
14/03/2009 08:00	9	260	0.0	998.4	1018.4
14/03/2009 09:00	8	260	0.0	999.7	1019.6
14/03/2009 10:00	15	290	0.0	1000.8	1020.6
14/03/2009 11:00	17	290	0.0	1001.5	1021.3
14/03/2009 12:00	16	290	0.0	1002.3	1022.1
14/03/2009 13:00	14	280	0.0	1003.1	1022.9
14/03/2009 14:00	14	290	0.0	1003.8	1023.6
14/03/2009 15:00	16	290	0.0	1004.4	1024.2
14/03/2009 16:00	13	290	0.0	1004.8	1024.6
14/03/2009 17:00	11	300	0.0	1005.4	1025.2
14/03/2009 18:00	10	300	0.0	1006	1025.9
14/03/2009 19:00	6	300	0.0	1007.1	1027.1
14/03/2009 20:00	4	280	0.0	1007.6	1027.7
14/03/2009 21:00	4	290	0.0	1008	1028.1
14/03/2009 22:00	6	260	0.0	1008.2	1028.4
14/03/2009 23:00	6	240	0.0	1008.4	1028.7
15/03/2009 00:00	5	230	0.0	1008.8	1029.2
15/03/2009 01:00	4	230	0.0	1009.4	1029.7
15/03/2009 02:00	4	250	0.0	1010	1030.5
15/03/2009 03:00	2	230	0.0	1010	1030.4
15/03/2009 04:00	3	220	0.0	1009.8	1030.2
15/03/2009 05:00	4	230	0.0	1010	1030.2
15/03/2009 06:00	4	210	0.0	1010.3	1030.6
15/03/2009 07:00	3	220	0.0	1010.6	1030.9
15/03/2009 08:00	4	220	0.0	1011.1	1031.3

15/03/2009 09:00	3	200	0.0	1011.8	1032
15/03/2009 10:00	5	190	0.0	1012	1032.1
15/03/2009 11:00	9	190	0.0	1012.1	1032.1
15/03/2009 12:00	11	200	0.0	1012.4	1032.4
15/03/2009 13:00	12	210	0.0	1012.1	1032.1
15/03/2009 14:00	12	200	0.0	1011.9	1031.9
15/03/2009 15:00	12	190	0.0	1011.9	1031.9
15/03/2009 16:00	10	190	0.0	1011.7	1031.7
15/03/2009 17:00	10	200	0.0	1011.6	1031.7
15/03/2009 18:00	8	200	0.0	1011.9	1032
15/03/2009 19:00	5	190	0.0	1012.3	1032.6
15/03/2009 20:00	4	170	0.0	1012.2	1032.5
15/03/2009 21:00	4	190	0.0	1012.3	1032.6
15/03/2009 22:00	2	200	0.0	1012.3	1032.6
15/03/2009 23:00	2	180	0.0	1012.2	1032.5
16/03/2009 00:00	3	190	0.0	1012	1032.3
16/03/2009 01:00	3	170	0.0	1012	1032.4
16/03/2009 02:00	3	180	0.0	1011.7	1032.2
16/03/2009 03:00	4	200	0.0	1011.2	1031.6
16/03/2009 04:00	3	200	0.0	1010.9	1031.2
16/03/2009 05:00	3	180	0.1	1010.6	1030.9
16/03/2009 06:00	3	180	0.0	1010.7	1031
16/03/2009 07:00	2	190	0.0	1010.9	1031.2
16/03/2009 08:00	2	190	0.0	1011.2	1031.4
16/03/2009 09:00	3	170	0.0	1011.4	1031.6
16/03/2009 10:00	5	200	0.0	1011.7	1031.9
16/03/2009 11:00	6	190	0.0	1011.6	1031.7
16/03/2009 12:00	7	200	0.0	1011.6	1031.6
16/03/2009 13:00	5	200	0.0	1011.3	1031.2
16/03/2009 14:00	6	200	0.0	1011.1	1031.1
16/03/2009 15:00	5	180	0.0	1011.1	1031.1
16/03/2009 16:00	5	160	0.0	1011.2	1031.2
16/03/2009 17:00	4	160	0.0	1011.2	1031.3
16/03/2009 18:00	4	150	0.0	1011.4	1031.5
16/03/2009 19:00	4	150	0.0	1011.7	1032
16/03/2009 20:00	3	160	0.0	1011.9	1032.3
16/03/2009 21:00	3	130	0.0	1012.3	1032.7
16/03/2009 22:00	5	130	0.0	1012.2	1032.5
16/03/2009 23:00	4	110	0.0	1012.1	1032.4
17/03/2009 00:00	4	110	0.0	1012	1032.3
17/03/2009 01:00	4	80	0.0	1011.9	1032.2
17/03/2009 02:00	5	80	0.0	1011.9	1032.2
17/03/2009 03:00	6	80	0.0	1011.8	1032.1
17/03/2009 04:00	7	90	0.1	1011.7	1032
17/03/2009 05:00	7	90	0.0	1011.6	1031.9
17/03/2009 06:00	8	110	0.0	1011.6	1031.8
17/03/2009 07:00	10	110	0.0	1011.9	1032.2
17/03/2009 08:00	11	90	0.0	1012.2	1032.5
17/03/2009 09:00	10	120	0.0	1012.4	1032.6
17/03/2009 10:00	12	120	0.0	1012.5	1032.7

17/03/2009 11:00	13	100	0.0	1012.7	1032.9
17/03/2009 12:00	13	100	0.0	1012.7	1032.8
17/03/2009 13:00	14	120	0.0	1012.7	1032.7
17/03/2009 14:00	14	120	0.0	1012.2	1032.1
17/03/2009 15:00	14	120	0.0	1012	1031.9
17/03/2009 16:00	12	120	0.0	1011.8	1031.7
17/03/2009 17:00	11	130	0.0	1011.8	1031.8
17/03/2009 18:00	11	110	0.0	1011.9	1032
17/03/2009 19:00	10	110	0.0	1011.9	1032.1
17/03/2009 20:00	8	110	0.0	1012	1032.2
17/03/2009 21:00	8	90	0.0	1012.1	1032.3
17/03/2009 22:00	9	90	0.0	1012	1032.3
17/03/2009 23:00	10	100	0.0	1012	1032.3
18/03/2009 00:00	8	110	0.0	1011.7	1031.9
18/03/2009 01:00	7	110	0.1	1011.6	1031.8
18/03/2009 02:00	7	110	0.0	1011.2	1031.4
18/03/2009 03:00	7	110	0.1	1011	1031.2
18/03/2009 04:00	8	120	0.0	1010.7	1030.9
18/03/2009 05:00	7	110	0.1	1010.7	1030.9
18/03/2009 06:00	7	90	0.0	1010.4	1030.6
18/03/2009 07:00	8	110	0.1	1010.3	1030.6
18/03/2009 08:00	8	110	0.0	1010.2	1030.4
18/03/2009 09:00	9	110	0.0	1010.4	1030.5
18/03/2009 10:00	10	110	0.0	1010.4	1030.5
18/03/2009 11:00	12	110	0.0	1010.5	1030.5
18/03/2009 12:00	11	110	0.0	1010.2	1030.3
18/03/2009 13:00	9	100	0.0	1010	1030.1
18/03/2009 14:00	8	110	0.0	1009.4	1029.5
18/03/2009 15:00	8	110	0.0	1008.9	1029
18/03/2009 16:00	8	100	0.0	1008.4	1028.5
18/03/2009 17:00	8	100	0.0	1008.3	1028.5
18/03/2009 18:00	8	110	0.0	1008.2	1028.4
18/03/2009 19:00	9	110	0.0	1008.1	1028.3
18/03/2009 20:00	9	90	0.0	1008.2	1028.4
18/03/2009 21:00	9	90	0.0	1008	1028.2
18/03/2009 22:00	10	100	0.0	1008.2	1028.4
18/03/2009 23:00	8	110	0.0	1008.1	1028.3
19/03/2009 00:00	7	90	0.0	1007.9	1028.1
19/03/2009 01:00	9	90	0.0	1007.7	1027.9
19/03/2009 02:00	8	80	0.0	1007.4	1027.6
19/03/2009 03:00	9	90	0.0	1007.1	1027.3
19/03/2009 04:00	7	80	0.0	1006.7	1026.9
19/03/2009 05:00	7	90	0.0	1006.5	1026.7
19/03/2009 06:00	7	90	0.0	1006.3	1026.5
19/03/2009 07:00	9	90	0.0	1006.3	1026.5
19/03/2009 08:00	10	80	0.0	1006.4	1026.6
19/03/2009 09:00	12	80	0.0	1006.6	1026.7
19/03/2009 10:00	13	90	0.0	1006.7	1026.8
19/03/2009 11:00	15	110	0.0	1006.7	1026.8
19/03/2009 12:00	15	110	0.0	1006.6	1026.7

19/03/2009 13:00	14	110	0.0	1006.3	1026.3
19/03/2009 14:00	13	90	0.0	1006	1026
19/03/2009 15:00	14	90	0.0	1005.9	1025.8
19/03/2009 16:00	12	90	0.0	1005.8	1025.7
19/03/2009 17:00	13	100	0.0	1005.6	1025.5
19/03/2009 18:00	11	110	0.0	1005.8	1025.8
19/03/2009 19:00	9	110	0.0	1005.9	1025.9
19/03/2009 20:00	8	100	0.0	1005.9	1026
19/03/2009 21:00	7	110	0.0	1006.3	1026.4
19/03/2009 22:00	7	110	0.0	1006.5	1026.6
19/03/2009 23:00	7	110	0.0	1006.6	1026.7
20/03/2009 00:00	9	110	0.0	1006.5	1026.6
20/03/2009 01:00	9	110	0.0	1006.2	1026.3
20/03/2009 02:00	8	110	0.0	1006.1	1026.3
20/03/2009 03:00	8	110	0.0	1005.9	1026.1
20/03/2009 04:00	8	110	0.0	1005.9	1026
20/03/2009 05:00	8	110	0.0	1006.2	1026.3
20/03/2009 06:00	10	110	0.1	1006.3	1026.4
20/03/2009 07:00	12	110	0.0	1006.6	1026.7
20/03/2009 08:00	12	130	0.0	1007	1027.1
20/03/2009 09:00	12	120	0.0	1007.2	1027.3
20/03/2009 10:00	13	130	0.0	1007.4	1027.4
20/03/2009 11:00	13	130	0.0	1007.8	1027.8
20/03/2009 12:00	12	130	0.0	1007.9	1027.9
20/03/2009 13:00	12	130	0.0	1007.8	1027.8
20/03/2009 14:00	12	120	0.0	1007.5	1027.4
20/03/2009 15:00	13	120	0.0	1007.4	1027.3
20/03/2009 16:00	13	120	0.0	1007.3	1027.2
20/03/2009 17:00	11	130	0.0	1007.9	1027.9
20/03/2009 18:00	8	130	0.0	1008.4	1028.4
20/03/2009 19:00	6	130	0.0	1008.9	1029
20/03/2009 20:00	5	120	0.0	1009.2	1029.3
20/03/2009 21:00	7	120	0.0	1009.7	1029.8
20/03/2009 22:00	5	130	0.0	1010	1030.1
20/03/2009 23:00	4	120	0.0	1010.4	1030.5
21/03/2009 00:00	4	100	0.0	1010.6	1030.8
21/03/2009 01:00	2	80	0.0	1010.8	1031
21/03/2009 02:00	1	60	0.0	1011	1031.2
21/03/2009 03:00	2	310	0.0	1011.2	1031.4
21/03/2009 04:00	4	330	0.0	1011.3	1031.5
21/03/2009 05:00	7	330	0.0	1011.8	1032.1
21/03/2009 06:00	8	340	0.0	1012.3	1032.6
21/03/2009 07:00	8	350	0.0	1012.8	1033.1
21/03/2009 08:00	7	350	0.0	1013.3	1033.6
21/03/2009 09:00	7	350	0.0	1013.9	1034.1
21/03/2009 10:00	11	330	0.0	1014.6	1034.8
21/03/2009 11:00	15	330	0.0	1015	1035.1
21/03/2009 12:00	13	350	0.0	1015.5	1035.6
21/03/2009 13:00	13	330	0.0	1015.7	1035.8
21/03/2009 14:00	12	340	0.0	1015.5	1035.5

21/03/2009 15:00	12	10	0.0	1015.9	1035.9
21/03/2009 16:00	11	10	0.0	1015.9	1035.9
21/03/2009 17:00	11	10	0.0	1015.8	1035.8
21/03/2009 18:00	9	10	0.0	1016.2	1036.2
21/03/2009 19:00	7	10	0.0	1016.8	1036.9
21/03/2009 20:00	9	330	0.0	1017.5	1037.7
21/03/2009 21:00	10	330	0.0	1018.1	1038.4
21/03/2009 22:00	8	330	0.0	1018.5	1038.9
21/03/2009 23:00	9	330	0.0	1018.6	1039
22/03/2009 00:00	6	330	0.0	1018.7	1039.2
22/03/2009 01:00	9	330	0.0	1018.7	1039.2
22/03/2009 02:00	7	330	0.0	1018.7	1039.2
22/03/2009 03:00	6	340	0.0	1018.1	1038.6
22/03/2009 04:00	7	310	0.0	1017.9	1038.4
22/03/2009 05:00	6	320	0.0	1017.9	1038.4
22/03/2009 06:00	7	310	0.0	1018.1	1038.6
22/03/2009 07:00	6	330	0.0	1018.4	1038.8
22/03/2009 08:00	5	320	0.0	1018.6	1039
22/03/2009 09:00	7	300	0.0	1018.5	1038.8
22/03/2009 10:00	10	320	0.0	1018.4	1038.6
22/03/2009 11:00	10	320	0.0	1018.2	1038.3
22/03/2009 12:00	11	310	0.0	1017.8	1037.8
22/03/2009 13:00	10	310	0.0	1017.4	1037.3
22/03/2009 14:00	9	290	0.0	1016.6	1036.4
22/03/2009 15:00	10	280	0.0	1016	1035.8
22/03/2009 16:00	12	290	0.0	1015.4	1035.2
22/03/2009 17:00	12	300	0.0	1014.9	1034.7
22/03/2009 18:00	14	310	0.0	1014.8	1034.8
22/03/2009 19:00	13	330	0.0	1015.1	1035.2
22/03/2009 20:00	11	310	0.0	1015.1	1035.3
22/03/2009 21:00	8	310	0.0	1014.9	1035.1
22/03/2009 22:00	6	290	0.0	1014.4	1034.6
22/03/2009 23:00	6	280	0.0	1013.8	1034.1
23/03/2009 00:00	9	300	0.0	1013	1033.2
23/03/2009 01:00	8	290	0.0	1012.1	1032.3
23/03/2009 02:00	8	290	0.0	1011.7	1031.9
23/03/2009 03:00	8	270	0.0	1010.8	1031
23/03/2009 04:00	6	260	0.0	1010.1	1030.3
23/03/2009 05:00	7	260	0.0	1009.1	1029.2
23/03/2009 06:00	11	290	0.0	1008.8	1028.9
23/03/2009 07:00	8	290	0.0	1008.5	1028.6
23/03/2009 08:00	9	280	0.0	1008.1	1028.1
23/03/2009 09:00	14	290	0.0	1007.5	1027.4
23/03/2009 10:00	19	290	0.0	1006.9	1026.8
23/03/2009 11:00	23	290	0.0	1006.6	1026.4
23/03/2009 12:00	19	280	0.0	1005.7	1025.5
23/03/2009 13:00	23	300	0.0	1005.3	1025.1
23/03/2009 14:00	26	290	0.0	1004.3	1024
23/03/2009 15:00	24	290	0.0	1004.5	1024.3
23/03/2009 16:00	20	290	0.0	1004.2	1024

23/03/2009 17:00	19	310	0.0	1004.7	1024.6
23/03/2009 18:00	13	310	0.0	1004.7	1024.6
23/03/2009 19:00	16	300	0.0	1005	1025
23/03/2009 20:00	12	300	0.0	1005.4	1025.4
23/03/2009 21:00	11	290	0.0	1005.7	1025.8
23/03/2009 22:00	11	300	0.0	1005.9	1026
23/03/2009 23:00	9	310	0.0	1006.3	1026.4
24/03/2009 00:00	9	310	0.0	1006.6	1026.7
24/03/2009 01:00	6	310	0.0	1006.5	1026.7
24/03/2009 02:00	5	300	0.0	1006.4	1026.6
24/03/2009 03:00	6	310	0.0	1005.9	1026.1
24/03/2009 04:00	5	290	0.0	1005.5	1025.7
24/03/2009 05:00	5	290	0.0	1005.2	1025.4
24/03/2009 06:00	6	290	0.0	1005.4	1025.6
24/03/2009 07:00	4	300	0.0	1005.5	1025.7
24/03/2009 08:00	4	290	0.0	1005.2	1025.4
24/03/2009 09:00	5	280	0.0	1005	1025.1
24/03/2009 10:00	7	250	0.0	1004.8	1024.7
24/03/2009 11:00	7	250	0.0	1004.5	1024.4
24/03/2009 12:00	7	270	0.1	1003.8	1023.6
24/03/2009 13:00	12	280	0.0	1002.8	1022.5
24/03/2009 14:00	12	270	0.0	1001.9	1021.6
24/03/2009 15:00	11	280	0.0	1001.2	1021
24/03/2009 16:00	13	270	0.0	1000.6	1020.3
24/03/2009 17:00	14	270	0.0	999.6	1019.3
24/03/2009 18:00	10	260	0.0	998.8	1018.5
24/03/2009 19:00	10	270	0.0	998	1017.8
24/03/2009 20:00	11	240	0.2	997.3	1017.1
24/03/2009 21:00	14	260	0.0	995.9	1015.7
24/03/2009 22:00	17	260	0.0	995.1	1014.9
24/03/2009 23:00	13	260	0.0	994.5	1014.2
25/03/2009 00:00	16	270	0.0	993.7	1013.4
25/03/2009 01:00	21	300	0.0	993.3	1013.1
25/03/2009 02:00	19	280	0.0	993	1012.8
25/03/2009 03:00	20	290	0.0	992.9	1012.7
25/03/2009 04:00	18	290	0.0	992.5	1012.3
25/03/2009 05:00	18	280	0.0	992.7	1012.5
25/03/2009 06:00	14	290	0.0	993.1	1012.9
25/03/2009 07:00	13	290	0.0	993.4	1013.2
25/03/2009 08:00	12	280	0.0	993.6	1013.4
25/03/2009 09:00	16	280	0.0	993.6	1013.4
25/03/2009 10:00	18	290	0.0	994.2	1014
25/03/2009 11:00	18	300	0.0	994.5	1014.2
25/03/2009 12:00	20	300	0.0	994.8	1014.5
25/03/2009 13:00	20	300	0.0	994.6	1014.2
25/03/2009 14:00	18	300	0.0	994.6	1014.2
25/03/2009 15:00	21	290	0.0	994.1	1013.7
25/03/2009 16:00	19	290	0.0	994	1013.6
25/03/2009 17:00	17	290	0.0	994.1	1013.7
25/03/2009 18:00	15	290	0.0	994.1	1013.8

25/03/2009 19:00	9	290	0.0	994	1013.8
25/03/2009 20:00	5	230	0.0	994	1013.8
25/03/2009 21:00	7	230	0.0	993.6	1013.4
25/03/2009 22:00	9	230	0.0	992.8	1012.6
25/03/2009 23:00	11	220	0.0	991.5	1011.3
26/03/2009 00:00	13	230	0.0	990.7	1010.4

Appendix I2
Dust Monitoring Report undertaken in April 2010

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

Air Report 2010

April 2010

Issue Date: 10/4/2010	No.: 1094_03_02	Rev.: 01	Approved By: POL

Celebrating ten years of excellence

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Glossary of Terms

CCR	Country Clean Recycling
DCP	**Dust Control Programme** A programme of works which is implemented to improve and achieve air quality standards.
MRF	**Materials Recovery Facility** A Materials Recovery Facility is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers
OELvs	**Occupational (Air) Exposure Limits** Occupational Exposure Limit Value (OELv) – the maximum permissible concentration of a chemical agent in the air at the workplace to which workers may be exposed in relation to 8hr or 15 minute reference period.
PPE	**Personal Protective Equipment** refers to protective clothing, helmets, goggles, or other garment designed to protect the wearer's body or clothing from injury by electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes, and in sports, martial arts, combat, etc. body armor is combat-specialized protective gear.
TSD	**Total Suspended Dust** Total Suspended Dust relates to a measure of all particles that are suspended in air.
TWA	**Time Weighted Average** Determines a person's time-weighted average (TWA) for exposure to a chemical. The total time is the total time of exposure. Typically, this is assumed to be an 8-hour period to determine the compliance with Health and Safety Legislation.
WEL	**Workplace Exposure Limits** Workplace exposure limits (WEL) – is the concentration of a hazardous substances in the air, averaged over a specified period of time referred to as a time weighted average (TWA) i.e. long term (8hr) and short term (15 minutes).

Country Clean Recycling Ltd.

Dust monitoring Report

June 2010

Contents

Attachments

Executive Summary

Dust monitoring was undertaken for Country Clean Recycling at their existing waste recovery facility located in Churchfield Industrial Estate, John F. Connolly Road, Co. Cork in December 2009.

This report comprises the second dust monitoring report undertaken for the facility which included both active dust monitoring for Total Suspended Dust (TSD) within the Materials Recovery Facility (MRF), and ambient dust monitoring around the external environs of the site.

Active Air Monitoring

The first assessment undertaken by OES in December 2009 found that the total inhalable dust fraction of the TSD within the site was lower than the Occupational Exposure Level (OEL) of 10 mg/m^3. The report recommended that a misting system should be utilised within the MRF to suppress dust. This system was subsequently implemented onsite.

This report assesses the effectiveness of the suppression system to remove TSD within the MRF and further reduce OELs. All results for TSD measured in both upper and lower processing buildings were significantly lower than the OEL value of 10 mg/m^3 for total inhalable dust (8-hour (TWA), and showed a considerable reduction from the first air monitoring survey. This illustrates the effectiveness of the dust suppression system in minimising TSD within the MRF.

Ambient Air Monitoring

The first assessment, undertaken by OES in December 2009, noted that three of the ambient monitoring locations were compliant with the Environmental Protection Agency limit value of 350 mg/m^2/day. Elevated dust deposition levels were recorded in the vicinity of the facility, more specifically in the region of sampling location D4, and D5.

The source of these elevated levels may be attributed to a combination of on-site as well as off-site activities. These monitoring points are located north of John F. Connolly Road and dust levels may be associated with the passing road traffic.

Dust control recommendations noted in the previous sampling report have been implemented onsite which included damping down the yard when required.

Ambient dust monitoring was undertaken at five locations around the facility and monitoring results were assessed against the Environmental Protection Agency limit value of 350 mg/m^2/day. All dust monitoring results for the sites were compliant with EPA limit values.

1. Introduction

OES were engaged by Country Clean Recycling Ltd. (CCR) to undertake qadust assessment of their existing waste recovery facility located in Churchfield Industrial Estate, John F. Connolly Road, Co. Cork.

A previous dust assessment was undertaken by OES in December 2009 in response to a site inspection letter received from Cork City Council. The results of the assessment showed that Total Suspended Dust (TSD) within the site was lower than the Occupational Exposure Level (OEL) of 10 mg/m^3 for total inhalable dust. One of the recommendations of the report was to install misting system within the Materials Recovery Facility (MRF) to suppress dust.

This report assesses the effectiveness of the suppression system to remove TSD within the MRF and further reduce OEL's. Where necessary recommendations to reduce for dust emissions from the site have bee noted.

The dust monitoring assessment comprised active monitoring of dust levels within the MRF, and ambient monitoring around the external environs of the site. Climatological data from Cork Airport Weather Met Éireann monitoring station (circa 20km south east of the site) was also used in the evaluation of ambient dust monitoring results.

1.1 Site Description

Country Clean Recycling Ltd. (CCR) currently operate a Materials Recovery Facility (MRF) located in Churchfield Industrial Estate, John F. Connolly Road, Co. Cork approximately 1.5 kilometers north of Cork City Centre as can be seen in Figure 1.1 of Attachment A.

CCR's operations involve the transfer, sorting, baling and recycling of waste material. Hence, there are no major scheduled emissions (i.e. through stacks, vents, etc.) planned for the development and site activities are unlikely to cause any deterioration in local air quality.

1.1.1. Waste Licence and Planning Application

CCR have applied to the Environmental Protection Agency (EPA) for a Waste Licence (Reg 0257_01) to increase its processing operations to 100,000 tonnes per annum. As part of the licence application a number of dust mitigation measures have been proposed to reduce emissions from the facility.

A planning application and Environmental Impact Statement (EIS) has been submitted to Cork City Council to increase the size of the Waste Transfer Station and undertake associated works as outlined below:

- demolish a section of the existing Materials Recovery Facility (MRF) of approximately 1,336m^2,
- construct an extension to the MRF comprising 2,980m^2 to include a new materials handling and sorting facility,
- construct new amenities building comprising offices, changing facilities, canteen and bathroom facilities,
- construct a new retaining wall along the southern boundary of the site to replace the existing fencing,
- widen the existing site entrance in order to increase sight lines and safety,
- construct an underground bunded oil storage tank of 62m^3 capacity and associated ancillary works.

1.2 Dust Emissions for Facility

The extent of any dust generation depends on the nature of the waste material, the waste sorting activities and the extent of dust control on-site. The potential for dust dispersion is influenced by the local meteorological factors such as rainfall, wind speed and wind direction.

All dust emitted from the facility can be described as fugitive. The potential sources of dust at the site is the MRF, the timber shredder, and hard standing areas in dry conditions. Dust generated in the MRF is as a result of the nature of the waste deposited in the building. The dust arising from the hard standing area is as a result of the traffic movements on the site. The activities of additional vehicles within the Industrial Estate may also generate quantities of dust, particularly in drier weather conditions.

The internal distributor roadway located at the southern boundary of the site is used frequently by Heavy Goods Vehicles (HGV's) accessing neighboring sites within the industrial estate. The movement of traffic along this road represents a source of dust when the surface is dry.

1.1.2. Occupational Dust

Dust is created, not only when solid material is worked on, but also whenever materials are moved or handled.

All dusts and fumes must be regarded as a health hazard. However, the effects of dust and fume particles in the air is dependent not only on their toxicity, but also on their size, which in turn determines whether they can be drawn into the deep lung spaces or are filtered out in the upper respiratory air passages of the nose. A problem associated with constantly working with fumes, gases and vapours is where the nasal passages become used to the substance in question and, as a result, do not warn the employee of possible danger. Most damage and toxic effects occur in the deep lung spaces and those particles are deposited there are called "*respirable dust*".

Irrespirable dust, on the other hand, refers to airborne material capable of entering the lungs, but which is filtered out by the respiratory tract. Airborne dusts that do not have identifiable toxic effects are termed "*nuisance dusts*". Where possible, dust-inhibiting measures, including dampening of floors and surfaces, vacuum-cleaning and exhaust ventilation of power tools should be used.

Lung and respiratory disease resulting from dust is called pneumocornosis, derived from the Greek — "*pneumo*", meaning lung, "*corn*", meaning dust, and "*osis*" meaning reaction. The development of pneumoconiosis depends on the type of dust, the susceptibility of the individual, the duration of exposure and the exposure to other chemicals or cigarette smoke at the same time.

Particle size affects toxicity: the smaller the particle, the further down in the lungs it can go, and the greater the amount of dust that will be retained. The more dust retained, the more severe the resulting illness. Microscopic dust particles may be so small that they behave like air, passing unimpeded through the protective barriers of hair in the upper airways.

1.3 Duties of Country Clean Recycling under Legislation

The Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001

Under the Chemical Regulations, Country Clean Recycling are required to ensure that risk from exposure of employees to hazardous substances such as dust is controlled at source or reduced to a minimum.

1.4 The Safety, Health and Welfare at Work (General Application) Regulations, 2007.

Country Clean Recycling must ensure that employees are properly informed, trained and supervised in all aspects of PPE. Employee's duties in regard to PPE must also be enforced. By introducing and running and effective PPE programme Country Clean Recycling would be able to fulfil all their duties under these regulations.

1.5 Dust Control Strategies

Having determined the level of dust and compared the level to the OEL a control strategy must be implemented. It is normally recommended that corrective action be taken immediately if the measured concentrations exceed 1 mg/m^3. There are two options:

- Zero exposure policy: This is usually impossible.
- Permit certain levels of exposure: These levels are applied to the workplace environment. Part of the safety procedures may involve the workers having to wear personal protective equipment. Some substances can be absorbed through the skin and airborne levels will not indicate total exposure. In these

cases, measures to prevent skin absorption must be put in place.

There is a number of possible control measures designed to ensure that the workforce is subjected to as little contamination as is reasonably practicable. These control strategies include:

- Elimination
  This simply means completely eliminating the potentially toxic material.

- Substitution
  This involves the substitution of the operations by safer alternatives.

- Process Substitution.

  This can take a number of forms:

  ⇒ Applying water close to the dust source can reduce dust hazards. This is usually done when sweeping out dusty areas.

  ⇒ Isolation
  The process is carried out away from the work area, as for the processing of dust generation.

  ⇒ Segregation or Enclosure
  This strategy involves enclosing the process totally. Examples would be enclosing a noisy machine by a physical barrier of absorbent material or enclosing dusts thus preventing their escape to the rest of the workplace.

In some cases, a particular process such as cleaning may be carried out only at night when a minimal workforce is present.

- Exhaust Ventilation
  Where it is not practical to enclose the process totally, removing gases, vapours, dusts and fumes using extraction systems can contain contaminants. These systems trap contaminants close to their source by filtering or delivering them to the outside atmosphere, thus preventing exposure to nearby workers. When using this strategy, care should be taken to ensure that other employees and the surrounding community is not contaminated and that only clean air is returned to the work atmosphere.

- Personal Hygiene and Good Housekeeping
  Personal hygiene and good housekeeping are necessary to ensure minimal contact with dust.

- Training and Education
  Because occupational health hazards cannot be seen, workers should be educated about them and know how they should be controlled.

2. Methodology

The air monitoring methodology was agreed in advance with Cork City Council Environmental Department as outlined below.

2.1 Active Dust Monitoring

Active dust monitoring comprised an assessment of TSD within the MRF at 4 fixed sampling points to determine the levels of nuisance dust present. The sampling points were located into upper and lower processing facilities within the MRF for ease of analysis as can be seen in Figure 2 of Attachment A.

Monitoring of TSD concentrations will allow comparison with the relevant Occupational (Air) Exposure Limits (OEL's) and environmental air quality standards. Whilst measurements of dust deposition will allow an assessment of whether dust nuisance is likely to occur at the nearest sensitive receptors.

The Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001, (as updated in 2007) deal with exposure to hazardous chemical agents (including dust). OELv have been set by the regulations to control dust concentrations. OELv provide a basis for ensuring that exposure to airborne contaminants in the workplace are controlled in such a way so as to prevent adverse health affects. Existing information has been used to establish limit values for exposures, which for the majority of chemicals, even when repeated throughout a working life, are not expected to result in adverse effects on health of exposed workers.

The OELv are assessed over an 8hr reference period. This period relates to the procedure whereby the occupational exposures in any 24hr period are treated as equivalent to a single uniform exposure for 8hrs (the 8hr TWA exposure).

The 8-hour TWA may be represented mathematically by:

$$\frac{C1T1+C2T2+...C0T}{8}$$

Where C1 is the occupational exposure and T1 is the associated exposure time in hours in any 24-hour period.

The OELv' for TSD is shown in Table 2.1

Table 2.1 Total Suspended Dust Occupational Exposure

Chemical Sampled	OEL/WEL	STEL/15 min referenc
Total Dusts	10 mg/m3	-

NB signifies no OELs/WEL or STEL/15 min ref available for that particular substance.

If an exposure level has exceeded its associated OELv's measures have to be taken to reduce it below its relevant OELv's and at all times exposure levels should be as low as is reasonably achievable.

Information on the General Applications Regulations including duties of the employer and employee are appended as Attachment B of the report.

TSD sampling was carried out by means of an R&P Partisol®-Plus Sequential Air Sampler (Model 2025). The sampler is a manual air sampling platform which has been designed to meet US EPA Reference Designation (RFPS-1928-127). Approximately 24 m^3 of air was sampled over 24-hour periods. The dust particles were collected on pre-weighed 47mm diameter glass fibre filters. The Partisol® sampler was programmed to begin and end sampling onto each pre-weighed filter at midnight, which ensured that each filter represented a sampling period of exactly 24 hours.

The TSD monitoring program used a continuous TSD sampler focused on assessing 24-hour average concentrations at four on-site locations (D6-D9) as can be seen in Figure 2 of Attachment A.

Monitoring was carried out over a 7-day week period at each location. The results were compared to the over on an eight hour TWA against OELv's for Total inhalable dust (10mg/m^3). The results can be directly compared with the Occupational Exposure Limit value for TSD as outlined in Table 2.1.

2.2 Ambient Dust Monitoring

Dust deposition monitoring was undertaken at five ambient perimeter locations around the site using the VDI Method 2119 Part 2[1] as can be seen in Figure 2 of Attachment A.

A description of the location of the dust monitoring locations is provided in Table 2.2.

Table 2.2 Ambient Dust Monitoring Locations around the External Environs of the Site

Dust Monitoring Location	Surrounding Environment
D1 Located to the northwest of the facility.	This monitoring location is bounded by a neighbouring facility to the west, the waste recovery facility to the south and east, and adjacent to a Greenfield site to the north.

[1] Measuring of particulate precipitation's - Determination of the dust precipitation with collecting pots made of glass or plastic).- Bergerhoff method

D2 Located to the north of the facility.	This monitoring location is bounded the waste recovery facility to the south, east, and west, and is adjacent to a Greenfield site to the north.
D3 Located to the northeast of the facility.	This monitoring location is bounded by the waste recovery facility to the south and west, and is adjacent to a greenfield site to the north and east.
D4 Located to the southeast of the facility.	This monitoring location is bounded by the waste recovery facility to the north and west, and is adjacent to a greenfield site to the east, and the John F. Connolly Industrial distributor road to the south.
D5 Located to the southwest of the facility.	This monitoring location is bounded by the waste recovery facility to the north and east, and is adjacent to a neighbouring site to the east, and the John F. Connolly Industrial distributor road to the south.

The apparatus consists of a plastic pot and a post with a protective basket, set at 1500mm above the ground level in accordance with the guidelines set out in the VDI 2119/Part 2. The ambient dust fall monitoring results were assessed against the Environmental Protection Agency limit value of 350 mg/m^2/day.

Climatological data from Cork Airport Weather monitoring station including wind speed & direction, rainfall, and atmospheric pressure was reviewed as part of the ambient dust concentration.

The location of each of the dust monitoring sites is outlined in Table 2.2.

3. Results and Discussion

3.1 Active Dust Monitoring

Active dust monitoring was undertaken at four monitoring locations (D6-D9) within the MRF. The building was split into two sections (upper and lower process buildings) for ease of analysis as can be seen in Figure 2.

The results of monitoring are shown in Table 3.1. Levels of TSD monitored during second sampling period illustrate that all results are below the 8-hour OEL value of 10 mg/m^3. Full details of the previous air monitoring assessment are also appended as Attachment C of the report.

TSD concentrations measured in the upper process building ranged from 0.05 to 0.16 mg/m^3. The average of the measured 24-hour concentrations was 0.11 mg/m^3. When compared with the first dust monitoring report TSD concentrations measured at the process building 1 ranged from 0.04 to 1.38 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.865 mg/m^3. Therefore it is evident that there is a considerable decrease in TSD (0.755 mg/m^3) since the first dust monitoring periods.

Total Suspended Dust concentrations measured at the lower process building ranged from 0.04 to 0.21 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.11 mg/m^3. Total Suspended Dust concentrations measured at the lower process building in the previous sampling programme ranged from 0.09 to 1.18 mg/m^3, with no exceedences of the 8-hour limit value of 10 mg/m^3. The average of the measured 24-hour concentrations was 0.575 mg/m^3. Similarly there was a considerable decrease (0.465 mg/m^3) since the first dust monitoring periods.

The lowest results of TSD were recorded on Sunday's when the site was not operational. This demonstrates that dust generated at the site are linked to operations within the MRF.

Table 3.1 Second Sampling Results for Active Total Suspended Dust Monitoring within the Materials Recovery Facility

	Date	Average Flow litres/min	Average Flow m3/day	Volume grams	First Filter Weight grams	Second Filter Weight grams	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL)
Week 1	28/02/2010	16.7	24	0.24291	0.24582	0.00291	0.12	0.12	
	01/03/2010	16.7	24	0.23676	0.24041	0.00365	0.15	0.15	
	02/03/2010	16.7	24	0.23952	0.24225	0.00273	0.11	0.11	
	03/03/2010	no valid sample							10
	04/03/2010	no valid sample							
	05/03/2010	16.7	24	0.22722	0.23070	0.00348	0.15	0.15	
	06/03/2010	16.7	24	0.23742	0.23910	0.00168	0.07	0.07	
Week 2	07/03/2010	16.7	24	0.22800	0.22974	0.00174	0.07	0.07	
	08/03/2010	16.7	24	0.22801	0.23034	0.00233	0.10	0.10	
	09/03/2010	16.7	24	0.23506	0.23810	0.00304	0.13	0.13	
	10/03/2010	16.7	24	0.24351	0.24662	0.00311	0.13	0.13	
	11/03/2010	no valid sample							
	12/03/2010	16.7	24	0.24255	0.24443	0.00188	0.08	0.08	
	13/03/2010	16.7	24	0.23714	0.23826	0.00112	0.05	0.05	
Week 3	14/03/2010	16.7	24	0.21282	0.21533	0.00251	0.10	0.10	
	15/03/2010	16.7	24	0.23086	0.23439	0.00353	0.15	0.15	
	16/03/2010								
	17/03/2010								10
	18/03/2010	16.7	24	0.23278	0.23540	0.00262	0.11	0.11	
	19/03/2010	16.7	24	0.23406	0.23785	0.00379	0.16	0.16	

	Date	Average Flow litres/min	Average Flow m3/day	Volume grams	First Filter Weight grams	Second Filter Weight grams	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL)
	20/03/2010	16.7	24	0.23126	0.23333	0.00207	0.09	0.09	
Week 4	21/03/2010	no valid sample							10
	22/03/2010	no valid sample							
	23/03/2010	16.7	24	0.24180	0.24447	0.00267	0.11	0.11	
	24/03/2010	no valid sample							
	25/03/2010	no valid sample							
	26/03/2010	16.7	24	0.22980	0.23318	0.00338	0.14	0.14	
	MOVED TO UPPER PROCESS BUILDING	16.7	24	0.22632	0.22987	0.00355	0.15	0.15	
	27/03/2010	16.7	24	0.22337	0.22588	0.00251	0.10	0.10	
Week 5	28/03/2010	no valid sample							
	29/03/2010	16.7	24	0.21748	0.22033	0.00285	0.12	0.12	
	30/03/2010	16.7	24	0.21454	0.21715	0.00262	0.11	0.11	
	31/03/2010	16.7	24	0.21159	0.21430	0.00271	0.11	0.11	
	01/04/2010	16.7	24	0.20865	0.21126	0.00261	0.11	0.11	
	02/04/2010	16.7	24	0.20570	0.20781	0.00211	0.09	0.09	
	03/04/2010	16.7	24	0.20276	0.20535	0.00259	0.11	0.11	
Week 6	04/04/2010	16.7	24	0.19981	0.20109	0.00128	0.05	0.05	
	05/04/2010	no valid sample							
	06/04/2010	16.7	24	0.19392	0.19491	0.00099	0.04	0.04	

	Date	Average Flow litres/min	Average Flow m3/day	Volume grams	First Filter Weight grams	Second Filter Weight grams	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL)
	07/04/2010	16.7	24	0.19098	0.19458	0.00360	0.15	0.15	
	08/04/2010	no valid sample							10
	09/04/2010	16.7	24	0.18509	0.18905	0.00396	0.17	0.17	
	10/04/2010	16.7	24	0.18214	0.18315	0.00101	0.04	0.04	
Week 7	11/04/2010	16.7	24	0.17920	0.18043	0.00123	0.05	0.05	
	12/04/2010	no valid sample							10
	13/04/2010	no valid sample							
	14/04/2010	16.7	24	0.17036	0.17241	0.00205	0.09	0.09	
	15/04/2010	16.7	24	0.16742	0.16891	0.00149	0.06	0.06	
	16/04/2010	16.7	24	0.16447	0.16779	0.00332	0.14	0.14	
	17/04/2010	16.7	24	0.16153	0.16435	0.00282	0.12	0.12	
Week 8	18/04/2010	16.7	24	0.15858	0.16009	0.00151	0.06	0.06	
	19/04/2010	no valid sample							
	20/04/2010	16.7	24	0.15269	0.15606	0.00337	0.14	0.14	10
	21/04/2010	16.7	24	0.14975	0.15236	0.00261	0.11	0.11	
	22/04/2010	16.7	24	0.14680	0.15195	0.00515	0.21	0.21	
	23/04/2010	16.7	24	0.14386	0.14668	0.00282	0.12	0.12	
	24/04/2010	16.7	24	0.14091	0.14295	0.00204	0.09	0.09	
Week 9	25/04/2010	16.7	24	0.13797	0.14043	0.00246	0.10	0.10	
	26/04/2010	16.7	24	0.13502	0.13863	0.00361	0.15	0.15	
	27/04/2010	no valid sample							10
	28/04/2010	no valid							

	Date	Average Flow litres/min	Average Flow m3/day	Volume grams	First Filter Weight grams	Second Filter Weight grams	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL)
		sample							
	29/04/2010	16.7	24	0.12619	0.12799	0.00180	0.07	0.07	
		16.7	24	0.12324	0.12454	0.00130	0.05	0.05	
		16.7	24	0.12030	0.12298	0.00268	0.11	0.11	

As can be seen from Table 3.1 Daily concentrations of TSD in both process buildings are well below the levels recorded in February to April 2010. Full details of active dust monitoring results for the first sampling period undertaken in December 2009 are appended as Attachment C of the report. Figure 3.1 shows comparison between the average TSD for each of the process buildings within the MRF for each of both surveys.

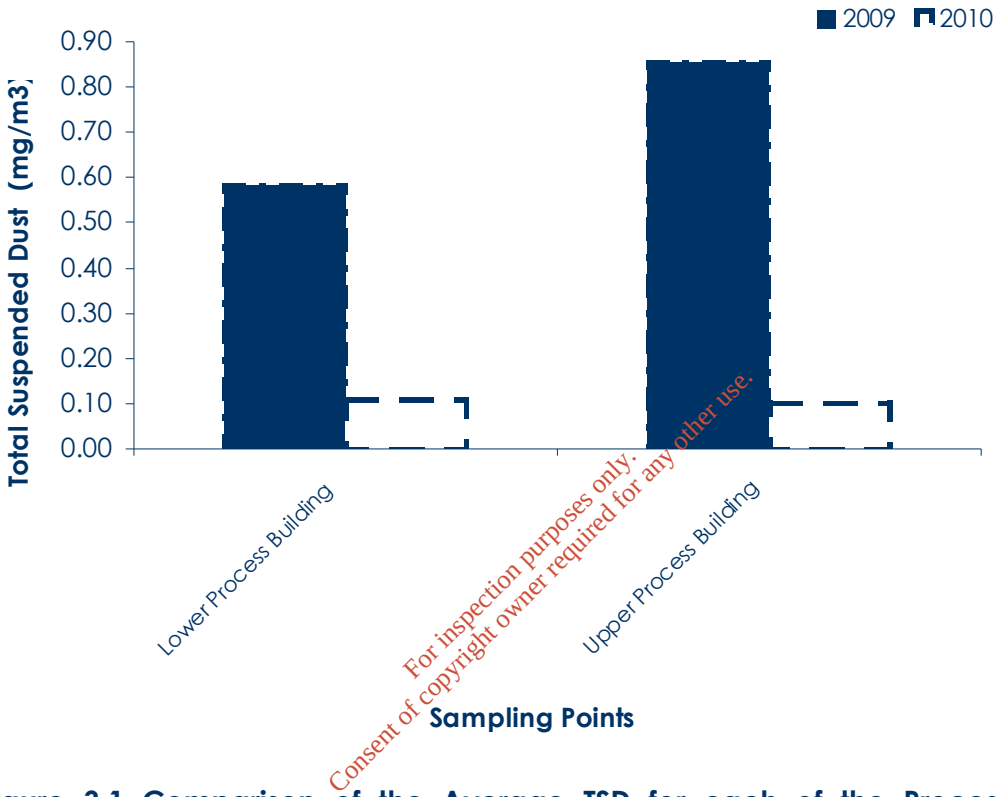


Figure 3.1 Comparison of the Average TSD for each of the Process buildings

3.2 Ambient Dust Monitoring Results

The dust monitoring results for both monitoring periods are detailed in Table 3.2. These were assessed against the recommended deposition limit of 350 mg/m2/day (TA –Luft guidelines). A copy of the dust monitoring certificate of analysis for the latest round of monitoring is appended as Attachment D of the Report.

Table 3.2 Ambient Dust Monitoring Results for Country Clean Recycling

Dust Monitoring Location within the Facility	Dust Results December 2009 (mg/m2/day)	Dust Results January (mg/m2/day)	TA-Luft Dust Deposition Limit (mg/m2/day)
D1 Northwest of site	104.2	91.5	350
D2 North of site	332.5	107.3	
D3 Northeast of site	248.6	97	
D4 Southeast of site adjacent John F. Connolly Road)	434.1	215.7	
D5 Southwest of site adjacent John F. Connolly Road	506.8	22.3	

As can be seen in Table 3.5 dust monitoring results for each of the monitoring points (D1-D5) have decreased significantly since the previous sampling period. The decrease between the monitoring events is illustrated in Figure 3.2.

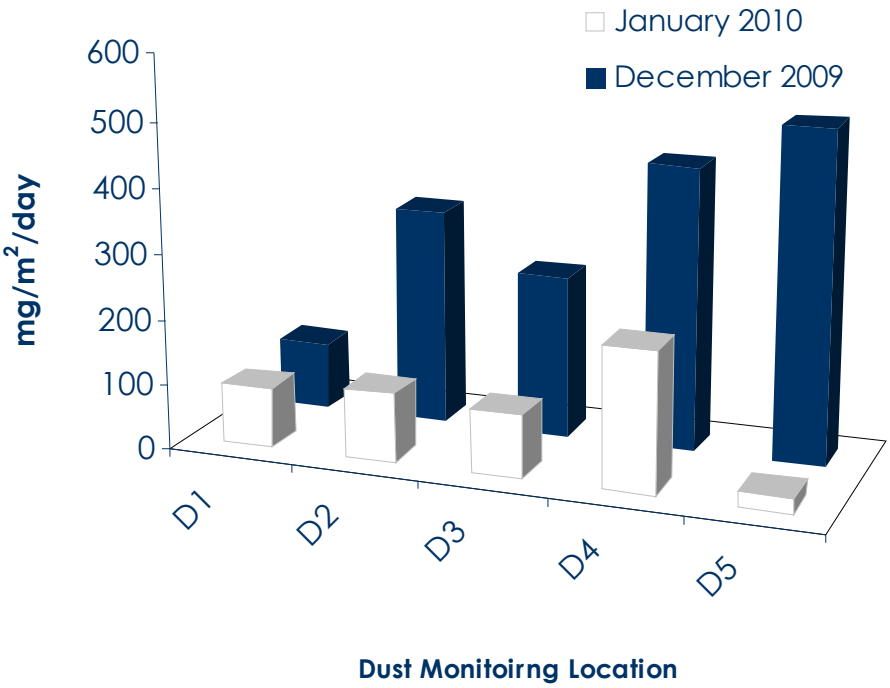


Figure 3.2 Comparison of Ambient Dust Monitoring Results for 2009 and 2010

As can be seen in Figure 3.2 there has been a significant decrease in the dust results from the previous sampling period. All of the recent results are compliant with the TA –Luft recommendation of 350 mg/m^2/day.

Climatological data obtained from Met Eireann is appended in Attachment E of the report. A windrose which displayed the direction of the wind indicated that the prevailing wind direction was from North West and to a lesser extend the southwest direction.

The marked decrease noted in TSD levels from within the MRF may have had a subsequent influence in reducing ambient levels of dust around the facility. In addition processing activities at the site were lower in the second monitoring period and on average 1000 less tonnes per month was processed onsite.

Dust control recommendations noted in the previous sampling report have been implemented onsite which included damping down the yard when required.

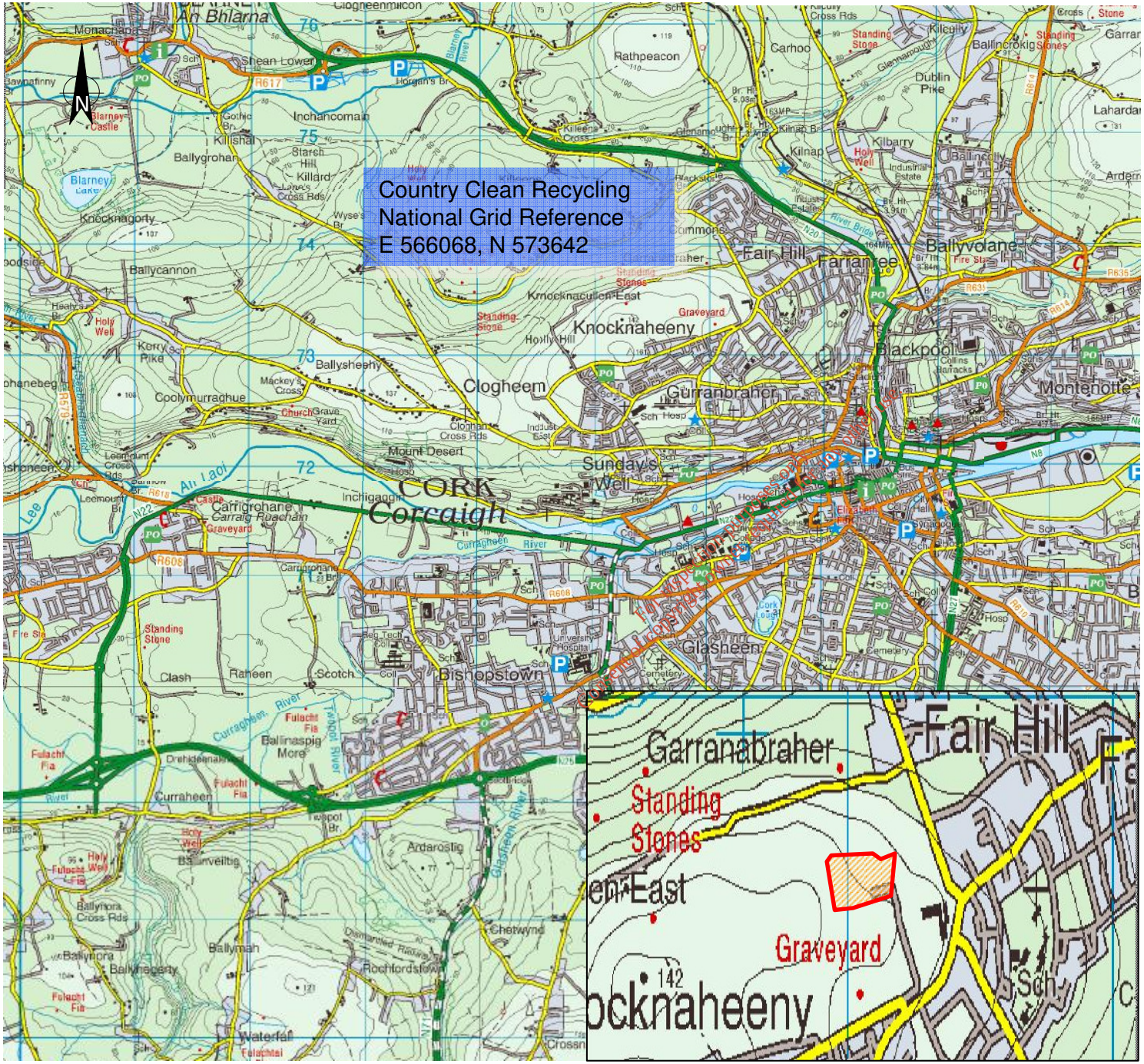
4. Conclusions and Recommendations

All results for TSD measured in both upper and lower process buildings were significantly lower than the OEL value of 10 mg/m^3 for total inhalable dust (8-hour (TWA), and considerably reduced from the first air monitoring survey. This illustrates the effectiveness of the dust suppression system in minimising TSD within the MRF.

The marked decrease in TSD levels within the MRF may have had a subsequent influence in reducing ambient levels of dust around the facility.

Recent ambient dust monitoring results indicate a significant reduction in dust levels within the site and show that it is compliant with TA-Luft Dust Deposition Limit. The site is currently applying to the Environmental Protection Agency for a Waste Licence. As part of the application CCR have proposed that dust monitoring is undertaken three times per annum. The results of the dust monitoring will allow CCR to monitor dust levels onsite and where appropriate implement the Dust Control Plan.

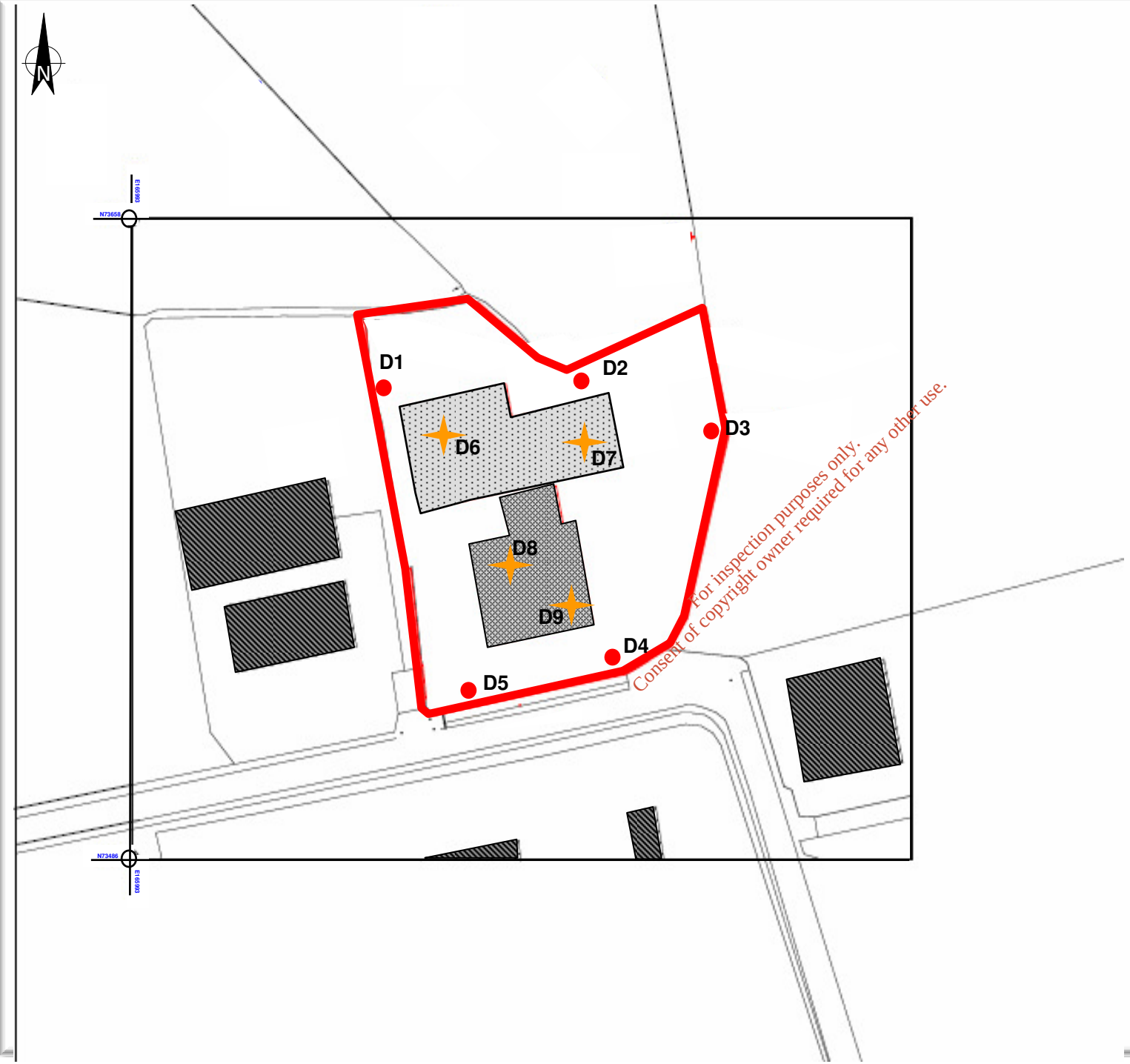
Attachment A
Figures



Client: Country Clean Recycling Ltd.
Project Code: 1094_03_02
Title: Site Location Map

Drawing No: F_109403_01
Issue Date: 24.03.2010
Revision: 01
Scale: NTS

OES
FBD House, Fels Point,
Tralee, Co. Kerry Ireland
P: 066-712 83 21 W: oes.ie



Country Clean Recycling Ltd. Site Boundary

Upper Process Building

Lower Process Building

Ambient dust monitoring perimeter locations D1-D5

Active dust monitoring perimeter locations D6-D9

Client: Country Clean Recycling Ltd.
Project Code: 1094_03_02
Title: Air Monitoring Locations

Drawing No: F_109403_01
Issue Date: 24.03.2010
Revision: 01
Scale: NTS

OES
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Tralee, Co. Kerry Ireland
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Energy, Environment & Safety

Attachment B
General Regulations

The Safety, health and Welfare at Work (General Application) Regulations 2007 (S.I. No.299 of 2007) were introduced in November 2007. These regulations revoke the provisions of the Safety, Health and Welfare at Work (General Application) Regulations 1993. These regulations bring together a wide variety of previous legislation and directives into a single comprehensive document. For the purposes of this report the most significant part of this legislation is contained in Chapter 3 of Part 2 which refers to personal protective equipment (PPE)

Chapter 3 of Part 2 of the Regulations re transposes Directive 89/656/EC on the use of PPE aimed at protecting the safety and health of employees. The fundamental principle underlining these provisions is that PPE should only be used as a last resort. The health and safety of employees should be primarily safeguarded by reducing the risk at source by administrative, operational or engineering controls. Employers should provide protection on a collective basis rather than an individual basis. However if these controls measures are insufficient PPE must be used to protect against unavoidable hazards. Section 8 of the 2005 Safety, Health and Welfare at Work Act (S.I. No. of 2005) also places a duty on employers to provide PPE when risk cannot be reduced or adequately controlled.

Chapter 3 of Part 2 of the regulations also apply other duties for employees in respect of PPE, namely selection, assessment, conditions of use and compatibility, maintenance and replacement, information and training.

The primary duties of these Regulations are as follows:

Regulation 63: Assessment of PPE

This regulation states that employers must make an assessment of the hazards in the workplace to identify the correct type of PPE to be provided and to ensure that PPE is appropriate to the risk. The level of risk must be assessed so the performance required by the PPE can be determined. PPE selected should be capable of reaching the level of protection required. It is essential that employees are consulted and involved in the selection of PPE.

Regulation 64: Conditions of Use and Compatibility

In determining PPE to be used an employer must select appropriate PPE which is user friendly and fits the individual employee correctly, after adjustment if necessary.

Regulation 65: Personal Use

This regulation states that PPE should normally be provided for personal use only. However sometimes expensive PPE such as respirators may be used by more that one person. In these circumstances the employer should have provisions in place to clean and disinfect the PPE before it is used by another individual.

Regulation 66. Maintenance and Replacement

PPE must be checked regularly, by properly instructed staff, in accordance with the manufacturers' and suppliers' instructions, to ensure that it is in good working order before it is given to the wearer. A maintenance programme,

especially on Respiratory protective equipment (RPE), should be set up. This should include the following,

- Cleaning and Disinfecting:
- Examination:
- Repair:
- Testing:
- Record keeping: Record keeping is especially important where there is a serious risk to safety and health, e.g. where RPE for use with toxic substances is specified.

Regulation 67: Information, Training and Instruction.

This regulation requires that where PPE is provided to employees they must be given suitable information, instruction and training to enable them to make proper use of the PPE provided. Employers should also insure that people are using the PPE properly by periodically checking that it is being used in accordance with the instruction or training in the use of PPE provided to employees.

The Role of Employees.

Employees should:

- Use PPE properly whenever it is required to be used:
- Report any defects in or damage to PPE immediately to their supervisor or employer:
- Participate in any training or instruction provided on PPE:
- Inform their employer of any medical conditions they have that might be affected by the use of the PPE provided:

In summary employees should assess the hazards to determine the appropriate PPE to use, employees should be consulted in PPE selection process and PPE selected should fit the employee properly. PPE should be only for individual use, with the exception of expensive equipment such as respirators. A maintenance and replacement programme should be in place and employees should be provided with instruction and training in PPE and its proper use. An overall PPE programme should be introduced to cover all of the above requirements it would also insure that all the requirements are fulfilled. Finally employees should be involved in all aspects of the PPE programme.

Attachment C
Ambient Dust Monitoring Certificate

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Country Clean Recycling Ltd
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Ireland

Certificate No.: 378752
Job Ref: 10B01185
Sample Ref No.: *LSN* 39/60366
Page No.: 1 of 4
Date Received: 04/02/2010
Date Reported: 22/02/2010

TEST REPORT

Sample Description Sample Ref. D1

Date Testing Initiated: 15/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA

	Test	Test Result	Unit	Method
*	**Dustfall Value (bergerhoff)**	**0.0915**	**g/m2/day**	**Ger. Eng. In. VDI 2119**

Tests marked * are not accredited.

Comments, opinions and interpretations expressed herein are outside this current scope of INAB accreditation.
Results apply only to samples tested, and as received at the Laboratory.

Signed for and on behalf of Exova (Ireland) Ltd.

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Ireland

Certificate No.: 378752
Job Ref: 10B01185
Sample Ref No.: *LSN* 39/60367
Page No.: 2 of 4
Date Received: 04/02/2010
Date Reported: 22/02/2010

TEST REPORT

Sample Description Sample Ref. D2

Date Testing Initiated: 15/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA

Test	Test Result	Unit	Method
* **Dustfall Value (bergerhoff)**	**0.1073**	**g/m2/day**	**Ger. Eng. In. VDI 2119**

Tests marked * are not accredited.

Comments, opinions and interpretations expressed herein are outside this current scope of INAB accreditation.
Results apply only to samples tested, and as received at the Laboratory.

Signed for and on behalf of Exova (Ireland) Ltd.

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Ireland

Certificate No.: 378752
Job Ref: 10B01185
Sample Ref No.: *LSN* 39/60368
Page No.: 3 of 4
Date Received: 04/02/2010
Date Reported: 22/02/2010

TEST REPORT

Sample Description Sample Ref. D3

Date Testing Initiated: 15/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA

Test	Test Result	Unit	Method
* **Dustfall Value (bergerhoff)**	**0.0970**	**g/m2/day**	**Ger. Eng. In. VDI 2119**

Tests marked * are not accredited.

Comments, opinions and interpretations expressed herein are outside this current scope of INAB accreditation.
Results apply only to samples tested, and as received at the Laboratory.

Signed for and on behalf of Exova (Ireland) Ltd.

Dan Healy
B.Sc (Hons)
Technical Manager

Exova
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Country Clean Recycling Ltd
T/A Cork Mini Skip
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Certificate No.: 378752
Job Ref: 10B01185
Sample Ref No.: *LSN* 39/60369
Page No.: 4 of 4
Date Received: 04/02/2010
Date Reported: 22/02/2010

TEST REPORT

Sample Description Sample Ref. D5

Date Testing Initiated: 15/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA

	Test	Test Result	Unit	Method
*	**Dustfall Value (bergerhoff)**	**0.0223**	**g/m2/day**	**Ger. Eng. In. VDI 2119**

Tests marked * are not accredited.

Comments, opinions and interpretations expressed herein are outside this current scope of INAB accreditation.
Results apply only to samples tested, and as received at the Laboratory.

Signed for and on behalf of Exova (Ireland) Ltd.

Dan Healy
B.Sc (Hons)
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Certificate No.: 378753
Job Ref: 10B02325
Sample Ref No.: *LSN* 39/66910
Page No.: 1 of 1
Date Received: 09/02/2010
Date Reported: 22/02/2010

TEST REPORT

Sample Description Dustfal D4 - 02/12/2009 - 04/02/2010

Date Testing Initiated: 15/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA

Test	Test Result	Unit	Method
* **Dustfall Value (bergerhoff)**	**0.2157**	**g/m2/day**	**Ger. Eng. In. VDI 2119**

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Attachment D
Total Suspended Dust Results 2009

Results of Active Total Suspended Dust Monitoring within the Materials Recovery Facility

	Date	Average Flow litres/min	Volume (m3/day)	First Filter Weight (grams)	Second Filter Weight (grams)	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL) (mg/m3)
Week 1 (D9)	14/03/2009	16.7	24	0.24894	0.25912	0.01018	0.42	10
	15/03/2009	16.7	24	0.25054	0.25396	0.00342	0.14	
	16/03/2009	16.7	24	0.25238	0.25905	0.00667	0.28	
	17/03/2009	16.7	24	0.25428	0.26135	0.00707	0.29	
	18/03/2009	16.7	24	0.25102	0.26914	0.01812	0.75	
	19/03/2009	16.7	24	0.24291	0.25415	0.01124	0.47	
	20/03/2009	16.7	24	0.23576	0.24482	0.00906	0.38	
Week 2 (D8)	21/03/2009	16.7	24	0.23352	0.24002	0.00650	0.27	
	22/03/2009	16.7	24	0.23445	0.23671	0.00226	0.09	
	23/03/2009	16.7	24	0.23368	0.25675	0.02307	0.96	
	24/03/2009	16.7	24	0.22722	0.25145	0.02423	1.01	
	25/03/2009	16.7	24	0.23742	0.26571	0.02829	1.18	
	26/03/2009	16.7	24	0.22800	0.25342	0.02542	1.06	
	27/03/2009	16.7	24	0.22801	0.24822	0.02021	0.84	
Week 3 (D7)	28/03/2009	16.7	24	0.23506	0.24247	0.00741	0.31	
	29/03/2009	16.7	24	0.24351	0.24436	0.00085	0.04	
	30/03/2009	16.7	24	0.24255	0.26561	0.02306	0.96	
	31/03/2009	16.7	24	0.23714	0.25994	0.02280	0.95	
	01/04/2009	16.7	24	0.21282	0.24589	0.03307	1.38	
	02/04/2009	16.7	24	0.23086	0.24991	0.01905	0.79	
	03/04/2009	16.7	24	0.23492	0.25915	0.02423	1.01	

	Date	Average Flow litres/min	Volume (m3/day)	First Filter Weight (grams)	Second Filter Weight (grams)	Total Dust Collected (grams)	Total Suspended Dust (mg/m3)	Occupational Exposure Limit (OEL) (mg/m3)
Week 4 (D6)	04/04/2009	16.7	24	0.23042	0.25315	0.02273	0.95	
	05/04/2009	16.7	24	0.23278	0.23667	0.00389	0.16	
	06/04/2009	16.7	24	0.23406	0.26715	0.03309	1.38	
	07/04/2009	16.7	24	0.23126	0.25764	0.02638	1.10	
	08/04/2009	16.7	24	0.23311	0.25634	0.02323	0.97	
	09/04/2009	16.7	24	0.23994	0.25443	0.01449	0.60	
	10/04/2009	16.7	24	0.24180	0.27485	0.03305	1.38	

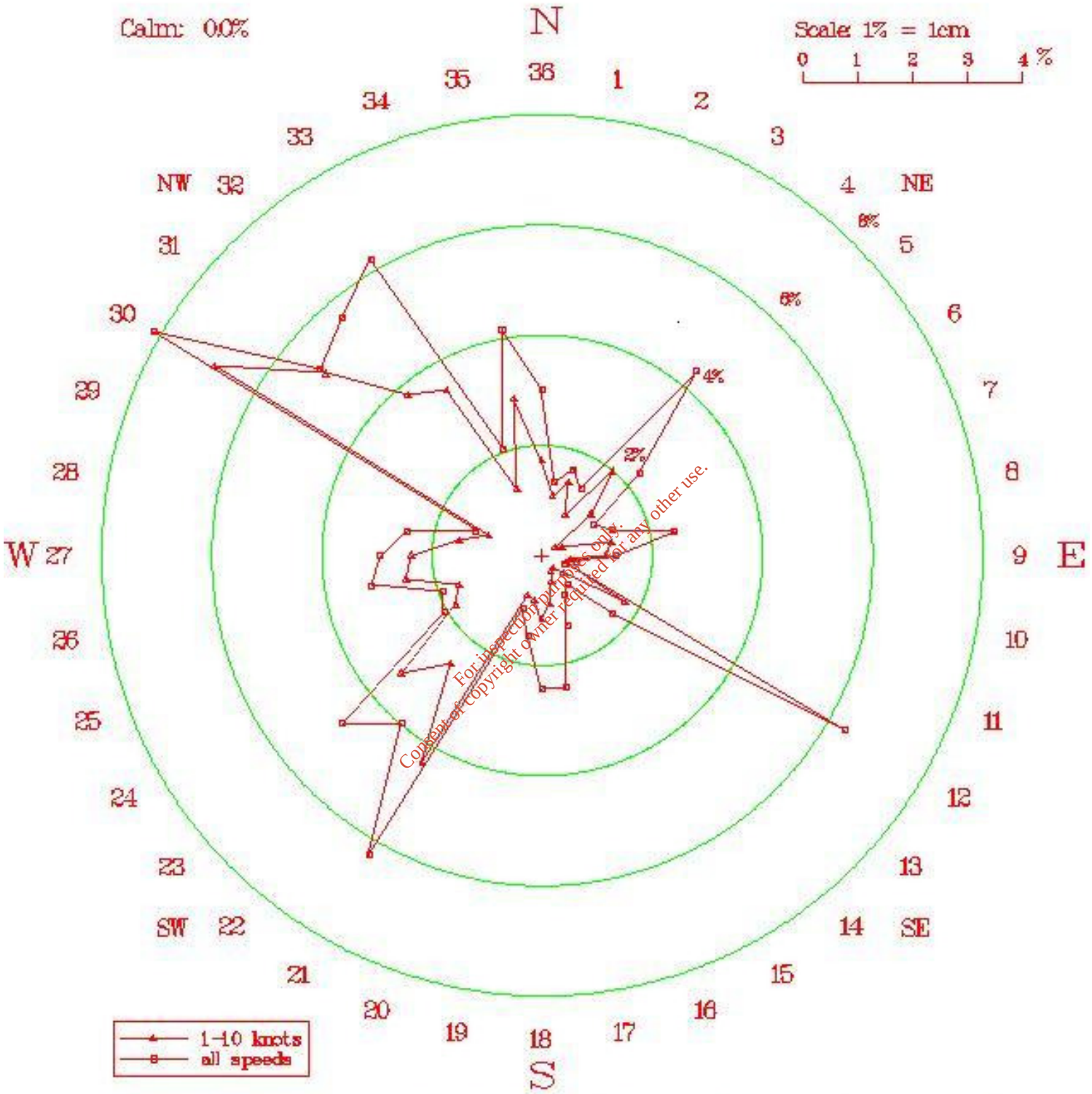
COUNTRYCLEAN RECYCLING LIMITED

Attachment E
Met Éireann Climatological Data

Cork Airport

Dec. 2009 - Feb 2010

Percentage Frequency of Occurrence of Wind Directions



Percentage Frequency of Occurrence of Wind Speeds

+ less than 0.1

0	1-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41-47	over 48	knots
0.0	8.1	22.2	33.5	25.4	6.5	3.0	1.2	+	0.0	0.0	%

mean wind speed: 9.8 knots

standard deviation: 5.5 knots

anemometer height: 12m

Met Eireann, Glasnevin Hill, Dublin 9.

Attachment I.2

Assessment of Impacts of Surface Water Discharges on the Receiving Waters

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

Project Ref: OES1094_01

Attachment I.2 Assessment of the Impacts of Surface Water Discharges on the Receiving Waters

All surface water from yard areas drains to a Class I Full Retention Oil interceptor and subsequently discharges to Cork City foul pipeline located to the north of the site. This discharge will not have a significant effect on the receiving pipeline. There is a water monitoring point at the outlet of the oil interceptor.

All roof water runoff from the Materials Recovery Facility will drain to an attenuation tank where it will be feed into Cork City Councils storm water pipeline.

There will be no water draining to receiving waters and as a result there is no requirement to monitor receiving water.

Attachment I.3

Assessment of Impact of Sewage Discharge

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

Project Ref: OES1094_09

Attachment I.3 Assessment of Impact of Sewage Discharge-Sampling Results-SEWER Discharge Licence

Sanitary effluent from the site discharges to Cork City Council sewer pipeline located to the south of the facility.

Process leachate generated from within the Materials Recovery Facility and lorry wash bay area is treated via a Class I Full Retention Oil Interceptor prior to discharging to Cork City Sewer pipeline located to the north of the facility. There is a monitoring point at the outlet of the oil interceptor.