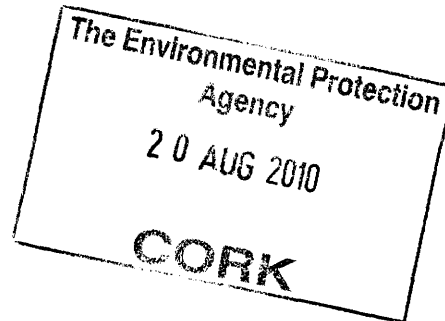


GLENSIDE ENVIRONMENTAL SERVICES

Acoustic & Environmental Consultants

24 The Heathers
Classes Lake
Ballincollig
Cork
Ireland
T: 021-4875183
M: 086-3819387
E: info@glenenv.ie

Ms. Siobhan McDonnell
Environmental Protection Agency
Regional Inspectorate
Inniscarra
Co. Cork
18th August 2010



RE: W0214-01 Ted O' Donoghue & Sons – Air Extraction & Wastewater Treatment Details

Dear Ms. McDonnell,

Please find attached an original and 3 copies of the following information relating to the Ted O' Donoghue & Sons facility for your consideration in relation to waste licence review.

1. Drawing of site showing proposed parking area and proposed effluent treatment by reed beds. Surfacewater run-off results from location SW1.
2. Design details of proposed reed bed treatment system
3. Details of proposed air treatment extraction system from Edpac International.

If you have any queries please contact me

Yours sincerely,

Pat Power

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WasteWorks

O'Donoghue and Sons
Cork

Wetland wastewater treatment system for treatment of runoff from yard and parking areas

1.0 Introduction

Wetlands are very appropriate sustainable wastewater treatment systems for a wide variety of municipal and commercial wastewaters, and are commonly used for treatment of surface water runoff from commercial operations such as carparking areas, municipal waste facilities, woodyards etc. WasteWorks is a leading designer and supplier of constructed reedbed and wetland systems for these applications. WasteWorks systems include: 550pe tertiary treatment Farranfore WWTW, Kerry CoCo: a wetland system for treatment of surface water runoff at Dingle Civic Amenity Site, Kerry CoCo, and a large wetland system for yard runoff at Standish sawmills, Roscrea.

2.0 Areas and flows

The wetland will treat surface water flows from the existing yard area (excluding roof areas of buildings which are collected separately), and a proposed new parking area. The areas involved are as follows:

2.1 Existing yard area

Main Yard	
Length (m)	123
Width (m)	65
Area (m ²)	7995
Less building roof area (m ²)	1440
Total yard surface area (m²)	6555
Average rainfall 180 days (mm)	500
Total 180d rainwater (m ³)	3278
Av rainwater/day (m ³ /d)	18

2.2 New parking area

Parking area	
Length (m)	110
Width (m)	50
Area (m ²)	5500
Less building area (m ²)	0
Total surface area (m²)	5500
Average rainfall 180 days (mm)	500
Total 180d rainwater (m ³)	2750
Av rainwater/day (m ³ /d)	15

WasteWorks

3.0 Existing and new treatment facilities

The current operational yard area is provided with grit-traps, an oil/water/solids interceptor and pumping chamber. All runoff from the yard is currently routed through this system. The discharge from this existing reception system will be connected to the new treatment facilities comprising buffer storage lagoon, wetland treatment system and tertiary percolation/wetland area, which will also treat new runoff flows from a new parking area. This parking area will be provided with new interceptor and pumping facilities, as shown in the attached flow diagram.

4.0 New interceptor and pumping facilities for parking area

All runoff from the new parking area will flow by gravity to a new prefabricated oil/water/solids interceptor.

Average 180d retention (d)	1.5
Calculated capacity (m3)	22.9
Designed Capacity (m3)	25
Retention - average 180 day (d)	1.6
Retention - high rain flow (d)	0.30

Wastewater from the outlet of the interceptor will flow by gravity to a new pump chamber and forward pump which is designed to cater for storm flows.

5.0 Lagoon for buffer storage of all flows

Wastewater systems perform best when the flows are buffered – both with regard to volume and strength. Accordingly all flows from existing and new facilities will be received into a lined lagoon.

Lagoon - yard and carpark	
Total surface area of collection (m2)	12055
Total average winter flow (m3/d)	33
Average winter retention time (days)	4
Lagoon capacity (m3)	134
Av hydraulic depth (m)	3.00
Freeboard (m)	0.50
Lagoon depth (m)	3.50
Plan area (m2)	45
Av dimensions (mxm)	6.68
Design length (m)	10.00
Design width (m)	4.5

Buffered flows from the lagoon flow by gravity to the inlet of the wetland system

6.0 Wetland treatment system

The wetland system is a lined constructed wetland with inlet and outlet gabions, overflow weir with level control, and having the following design specification:

WasteWorks

Wetland	
Average winter retention time (days)	2.5
Wetland capacity (m3)	84
Av water depth (m)	0.15
Wetland depth (m)	0.5
Area (m2)	558
No beds	1
Area (m2)	558
Av dimensions (mxm)	23.62
Design length (m)	20.00
Design width (m)	27.91
WWAR (watershed/wetland ratio)	5

7.0 Performance

Wetlands are highly effective means of settlement of suspended solids, a provide excellent reduction of BOD, COD, and nutrients

Contaminants will be reduced by both lagoon and wetland system. Typical reduction of contaminants are expected as follows:

Organic compounds (BOD)	>70%
Phosphates (PO4)	>50%
Nitrates (NO3)	>50%
Trace metals (eg copper)	>70%

For instance studies on reduction of copper from wetlands have shown the following averages:

Source	Input (ug/ml)	Output (ug/ml)
Hendrey et al (1979)	1510	60
Crites et al (1995)	8	3

8.0 Percolation area and tertiary wetland area

Treated water will flow by gravity to a bunded percolation area, which is developed as a natural wetland area.

Tertiary perc/wetland	
Length (m)	48.5
Width (m)	28.5
Area (m2)	1382



**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballincollig
Co. Cork
Ireland**

**Certificate No.: 386034
Job Ref: 10B06677
Sample Ref No.: LSN 39/90359
Page No.: 1 of 1
Date Received: 25/02/2010
Date Reported: 15/03/2010**

TEST REPORT

Sample Description Water - SW1 - Feb. 2010

**Date Testing Initiated: 26/02/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA**

Test	Test Result	Unit	Method
Ammonia Nitrogen (as N)	1.9	mg/l	ET 0383 MEWAM 1981
Suspended Solids	72	mg/l	ET 0423 from APHA 2005:2450:B
BOD 5d with nitrification inhib	44	mg/l	ET 0663 APHA 2005:5210:B
Chemical Oxygen Demand (COD)	161	mg/l	ET 0673 APHA 2005:5220:C
* Sulphate by IC	477	mg/l	ETC981
Total Phosphorus (as P)	1.28	mg/l	ET G013 based on ISO 6838:2004
Soluble Reactive Phosphorus (as P)	<0.03	mg/l	ETG022 from EN ISO6878:2004

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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





**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballinacollig
Co. Cork
Ireland**

**Certificate No.: 382330
Job Ref: 10B06679
Sample Ref No.: LSN 39/90361
Page No.: 1 of 1
Date Received: 25/02/2010
Date Reported: 02/03/2010**

TEST REPORT

Sample Description Water SW1 - Feb. 2010

**Date Testing Initiated: 25/02/2010
Category: MICRO
Sample Condition: Satisfactory
Order No.: NA
Supplier Code:**

Test	Result	Unit	Method	Comments	Est.
* Total Coliform MPN per 100mls	110,000	MPN/100mls	MT0482 / APHA 2005 9221B		
* Faecal Coliform MPN per 100mls	11,000	MPN/100mls	MT0492 / APHA 2005 9221E.1		

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

Michelle Everard
B.Sc (Biosciences)
Snr. Tech Microbiology Division





**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballinacollig
Co. Cork
Ireland**

**Certificate No.: 398723
Job Ref: 10C08201
Sample Ref No.: LSN 40/41664
Page No.: 1 of 1
Date Received: 31/03/2010
Date Reported: 20/04/2010**

TEST REPORT

Sample Description Water - SW 1

**Date Testing Initiated: 01/04/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA**

Test	Test Result	Unit	Method
Ammonia Nitrogen (as N)	0.3	mg/l	ET 0383 MEWAM 1981
Suspended Solids	27	mg/l	ET 0423 from APHA 2005:2450:B
BOD 5d with nitrification inhib	11*	mg/l	ET 0663 APHA 2005:5210:B
Chemical Oxygen Demand (COD)	67	mg/l	ET 0673 APHA 2005:5220:C
* Sulphate by IC	278	mg/l	ETC981
Total Phosphorus (as P)	0.45	mg/l	ET G013 based on ISO 6838:2004
Soluble Reactive Phosphorus (as P)	0.11	mg/l	ETG022 from EN ISO6878:2004

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

Dan Healy
B.Sc (Hons)
Technical Manager



183T



**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballincollig
Co. Cork
Ireland**

**Certificate No.: 394205
Job Ref: 10C08206
Sample Ref No.: LSN 40/41717
Page No.: 1 of 1
Date Received: 31/03/2010
Date Reported: 06/04/2010**

TEST REPORT

Sample Description Water - SW 1

**Date Testing Initiated: 31/03/2010
Category: MICRO
Sample Condition: Satisfactory
Order No.: NA
Supplier Code:**

Test	Result	Unit	Method	Comments	Est.
* Total Coliform MPN per 100mls	110,000	MPN/100mls	MT0482 / APHA 2005 9221B		
* Faecal Coliform MPN per 100mls	110,000	MPN/100mls	MT0492 / APHA 2005 9221E.1		

Comment: The time of sampling for the above sample (s) was not recorded, therefore the validity of results cannot be assured.

Tests marked * are not accredited.

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

Peter Piggott
Dip. Food Tech.
Manager Microbiology Division





**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballincollog
Co. Cork
Ireland**

**Certificate No.: 407170
Job Ref: 10D07287
Sample Ref No.: LSN 40/87676
Page No.: 1 of 1
Date Received: 30/04/2010
Date Reported: 14/05/2010**

TEST REPORT

Sample Description Water - SW 1 April

**Date Testing Initiated: 30/04/2010
Category: ENVIRONMENTAL
Sample Condition: Satisfactory
Order No.: NA**

Test	Test Result	Unit	Method
Ammonia Nitrogen (as N)	2.3	mg/l	ET 0383 MEWAM 1981
Suspended Solids	102	mg/l	ET 0423 from APHA 2005:2450:B
BOD 5d with nitrification inhib	46	mg/l	ET 0663 APHA 2005:5210:B
Chemical Oxygen Demand (COD)	163	mg/l	ET 0673 APHA 2005:5220:C
pH Value	10.5	pH unit	ET 1243 APHA 2005:4500:H:B
* Sulphate by IC	453	mg/l	ETC981
Total Phosphorus (as P)	1.78	mg/l	ET G013 based on ISO 6838:2004
Soluble Reactive Phosphorus (as P)	0.34	mg/l	ETG022 from EN ISO6878:2004

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

Dan Healy
B.Sc (Hons)
Technical Manager





**Patrick Power
Glenside Environmental
24 The Heathers
Classes Lake
Ballincollig
Co. Cork
Ireland**

**Certificate No.: 403796
Job Ref: 10D07286
Sample Ref No.: LSN 40/87675
Page No.: 1 of 1
Date Received: 30/04/2010
Date Reported: 04/05/2010**

TEST REPORT

Sample Description Water - SW 1 April

**Date Testing Initiated: 30/04/2010
Category: MICRO
Sample Condition: Satisfactory
Order No.: NA
Supplier Code:**

Test	Result	Unit	Method	Comments	Est.
* Total Coliform MPN per 100mls	460	MPN/100mls	MT0482 / APHA 2005 9221B		
* Faecal Coliform MPN per 100mls	240	MPN/100mls	MT0492 / APHA 2005 9221E.1		

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

Peter Piggott
Dip. Food Tech.
Manager Microbiology Division



Details of Air Extraction System proposed by EDPAC International

The main points are as follows:

1. Ductwork to be installed at high level at back of waste station and will include a leg that will extract air from over the picking station. The volume overall will be 12.5m³/s (45,000m³/hr) providing 5 air-changes per hour. This breaks down to 11.5m³/s general area extract and 1.0m³/s from the picking station. The intention is to provide a negative pressure in the region of the ductwork drawing air through the building from the door/vehicle entrance area.
2. The main duct will penetrate through the building cladding and drop down outside and connect into an extract unit which is to be mounted on a purpose made concrete plinth.
3. This extract unit contains panel, bag and carbon filters internally to filter the air - see attached details. The fan is a direct driven plug type controlled by an inverter to allow simple change of air volume if so required. The carbon filters are made up of 192 carbon cylinders fitted into 12 purpose made frames.
4. A small control panel is to be provided for this unit which can be mounted within the unit or remotely.

Edpac Work

1. Ductwork installation :
2. Supply and commissioning of extract unit including filters :
3. Supply and commission of control panel for above unit

Works by O Donoghue Waste

1. Plinth for extract unit
2. Off-loading of extract unit onto plinth (teleporter or forklift)
3. Provision of main ope in cladding for ductwork - ope size 1600x1600approx
4. Site wiring, power supply to unit and wiring between panel and unit if panel is to be remote

Consent of O Donoghue Waste Inspection purposes only
Consent of O Donoghue Waste owner required for any other use.



TECHNICAL SPECIFICATION SHEET

File: Q6414-01-A

PROJECT DETAILS

Date	01 July 2010	Unit No.	Q6414-01-A
Project Reference	O Donoghue Waste	Rev Date	01 July 2010
Project No.	6414	Air Flow (m3/s)	NaN
Customer		Total Static Pressure (Pa)	839
Unit Reference	Extract Filtration Sytem	Quantity	1

UNIT CONSTRUCTION

Unit Model		AHU Location	External
Aluminium Frame Work	50mm A Post 1.7 Galv	Panel Depth	
Base Frame	PB 150	Panel Construction External	0.5 Prevarnished Zinc coated Steel
Frame Coating	Mill Finished	Panel Construction Internal	0.5 Prevarnished Zinc coated Steel
Access Side	Right	Panel Insulation	Expanded Polyurethane 25mm of density 45 Kg/m3

SECTION WEIGHTS AND DIMENSIONS

Section No.	Width (mm)	Height (mm)	Length (mm)	Weight (KG)
Section A	2890	2180	4665	2147
Overall Unit Dimensions	2890	2180	4665	2147

INLET SECTION

Height x Width x Depth	None	mm	Location	Onair	Section A
Flange size	None	mm	Mounting	None	
Edge seals	None		Blade type	None	
Additional opening type	50mm spigot GI		Alignment	Bottom	
Additional opening H x W	2080 x 2790	mm	Damper Material	None	
Additional opening finish					

PANEL and BAG FILTER

Panel Grade	EU 4	Bag Grade	EU7	Section A
Filter make	Camfil/Equivalent	Filter make	Camfil/Equivalent	
Filter type	Flat	Filter type	Flange	
Pressure Drop Calc	Dirty	Pressure Drop	330	Pa
Withdrawal	Side	Withdrawal	Side	
Media	Cotton & Synthetic Fibre	Media	Synthetic Fibre	
Efficiency	90% < Am	Efficiency	80<Em<90	
Spare filter sets	None	Filter Face Area	4.8	Sq.m
Size Ref:	12x596x596x48 mm	Size Ref:	12x592x592x534	mm

Size Ref: 3x292x596x48 mm Size Ref: 3x287x592x534 mm

ACCESS DATA

Type/Position Hinged door/Left Width 0 mm

PLENUM SECTION

length 660 mm Access Hinged door

Section A

Extras: Bulkhead Appleby

EXHAUST FAN

Section A

Volume	12.500000	m3/s	External static pressure	300.00	Pa
Type	Plenum Fan		Total pressure	839.00	Pa
Fan Reference	ER10C-6DN.N7.1R-130533/0121		Motor Frame size	180M	
Fan ABS power	15.04		Motor power	18.50	kW
Fan Speed	1009.00	rpm	Motor speed	1400	rpm

Extras: 3P+Aux Enclosed Isolator 32A IP65

CARBON FILTER

Section A

Grade	Activated carbon		Withdrawal Filter type	Front
Filter make	Camfil/Equivalent			CamCarb
Media	Carbon CM 05			
Pressure Drop Calc	Dirty			
Spare filter sets	None			
Size Ref:	12x610x610x455	mm		
Size Ref:	192 x cylinders	mm		

ACCESS DATA

Type/Position Hinged door/Left Width 0 mm

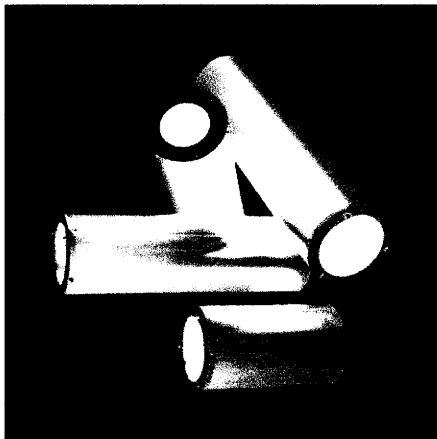
OUTLET SECTION

Section A

Height x Width x Depth	1780 x 2490 x 125	mm	Location	Ofair
Flange size	30.00	mm	Mounting	Internal
Edge seals	Yes		Blade type	Opposed
Additional opening type	125mm louvre GI		Alignment	Bottom
Additional opening H x W	2080 x 2790	mm	Damper Material	Aluminum
Additional opening finish				

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Activated Carbon Filters



Ed. Jan. 2003

Adsorption and Deodorisation

ADVANTAGES

- Semi-industrial applications
- High performance
- Easy maintenance
- Rapid bayonet fitting system fixing

☺ **Camfil hints!** To avoid clogging the activated carbon, it is vital to install filters upstream with a minimum efficiency of 85% OPACIMETRIC (F7) type HFLO, S-FLOW or OPAKFIL

CAMCARB Cylinders

Application: Adsorption of odours (deodorization), adsorption of VOC and low toxicity gases.

Type: Cylindrical activated carbon cartridge, rapid bayonet system fixing.

Temperature: 40°C maximum in continuous service.

Mounting system: CAMCARB support plate, FCBL-CC housing.

Cylinders: Zinc-plated steel sheet.

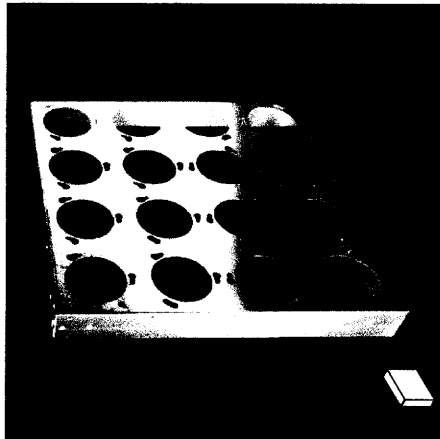
Carbon: Coconut shell carbon: CM 05.

Reference	Type	Model	Dimensions (WxHxD) mm	Carbon thickness	Carbon volume (litres)	Type of carbon	Air flow/pressure drop for contact time = 0.15 s m ³ /h/Pa	Unit weight kg	Unit volume m ³
571004	Camcarb	Cylinder 2000	145x145x455	16	2.9	CM 05	63/10	3.2	0.01
571007	Camcarb	Cylinder 2600	145x145x455	26	4.3	CM 05	94/40	4.0	0.01
571703	Camcarb	Cylinder 3500	145x145x605	26	5.7	CM 05	125/40	5.2	0.02

Other types of activated carbon available. Contact us. Stainless steel version on request.

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Activated Carbon Filters



Ed. Jan. 2003

Adsorption and Deodorisation

ADVANTAGES

- Modular design adaptable for all types of installations
- Easy maintenance
- Rapid tightening system via bayonet fitting
- Quick and easy service

CAMCARB Mounting Frames

Application: Assembly of Camcarb activated carbon cylinders.

Type: Quick bayonetmounted support plate for Camcarb cylinders.

Design: Galvanised steel or stainless steel.

For filters: Camcarb activated carbon cylinders.

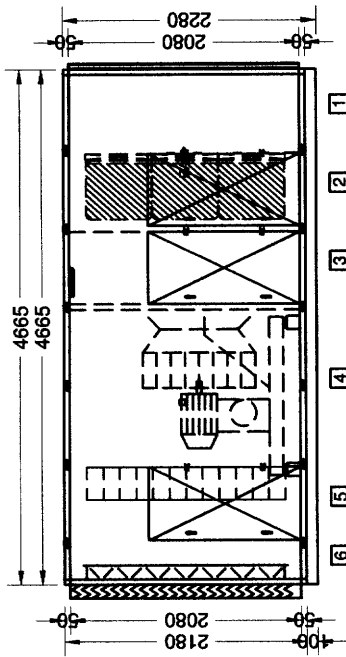
Mounting: Bayonet locking.

Reference	Type	Model	Overall dimensions (WxHxD) mm	Number of slots for cylinders	Unit weight kg	Unit volume m ³
59300301	Camcarb	Frame G8	305x610x70	8	3.0	0.02
59300601	Camcarb	Frame G16	610x610x70	16	4.8	0.04
16185400	Camcarb	Frame G8 SS	305x610x70	8	4.0	0.02
16185600	Camcarb	Frame G16 SS	610x610x70	16	5.0	0.04

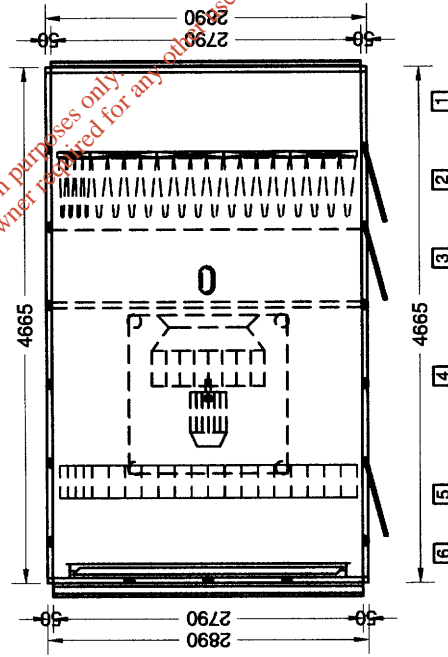
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Exhaust: E-120
 Size: 12.50 m³/s
 Airflow: 300 Pa
 E.S.P.: 2146.890 kg

Section A:		Length(mm)
S.No	Module	
1	Inlet Section	710
2	Panel & Bag Filter	710
3	Plenum	710
4	Plenum Fan	1420
5	Carbon Filter	710
6	Outlet Section	355



ELEVATION



PLAN DECK

Customer	AHU No.	001	Not To Scale All Dimensions shown are in mm		This Drawing is property of AHS and should not be reproduced in any form		No.	Revision	Date
Project	Model		Selected	Initial	Date				
Location	Air flow	NaN	m ³ /s	Approved					
	Quantity	1	Nos.	Dwg No.					
			EDPAC International						
			Carrigaline Industrial Park, Carrigaline, Co. Cork, Ireland				Ph: +353 21 4372850 Fax: +353 21 4372756 Web: www.edpac.com		