Curragh Tintawn Carpets Limited
Application for an IPPC Licence

Attachment E.1.A

Emissions to Atmosphere

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Environmental Protection Agency
IPC Licensing
Received 21 OCT 2005
Initials

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Section **Page No**

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1.0 Summary List of all Emissions to Atmosphere

There are 5 main emission points at the Curragh Tintawn Carpets Limited site. These emissions arise from the use of 5 gas fired dryers. A summary of all emissions to atmosphere from the Curragh Tintawn Carpets Limited site is presented in the table below. A site drawing indicating the main atmospheric emission points is contained in Appendix E.1.1.

Table 1: Summary Description of Emissions to Atmosphere

Ref No	Description
004B	Drying Oven Stack 1
005B	Drying Oven Stack 2
006B	Drying Oven Stack 3
007B	Drying Oven Stack 4
008B	Drying Oven Stack 5

2.0 Sources of Emissions

2.1 Sources related to emission points 004B – 008B.

The 5 gas fired dryers function to dry the latex backing applied to the carpets manufactured on site. The gas used to fire the ovens is propane. The emissions to atmosphere consist mainly of CO_2, NOx and water vapour. There are two sources of nitrogen oxides; thermally bound NOx and fuel bound NOx. Thermal NOx is directly controlled by the peak temperature of the flame and the reaction of "free" nitrogen in the combustion are and the fuel. The amount of thermal NOx generated increased with the peak temperature of the flame. Fuel bound NOx is related to the amount of nitrogen that is chemically bound in the fuel.

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3.0 Abatement of Emissions

Emissions to atmosphere monitoring conducted on behalf of Curragh Tintawn Carpets demonstrate that the TOC emissions from these dryers are consistently lower than the laboratory limits of detection. Propane is a very clean burning fuel and therefore no abatement technology is employed in relation to the gas fired dryers.

4.0 Emissions to Atmosphere Monitoring

Each of the 5 carpet dryers are monitored for emissions to atmosphere according to the current IPC Licence schedule, on an annual basis. The results for most of the TOC samples were below the limit of detection of 10 micrograms per tube. For this reason all of these results are reported as a "less than" (<) value. (In 2002 and 2003 the LOD was 20 µg per tube however, all of the monitoring results are in the same order of magnitude and therefore comparable).

Results of atmospheric emission monitoring carried out between 2001 and 2005 are presented in tables E1 and E2 below.

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Table E1 TOC Concentrations 2001-2005

Emission Point	TOC Concentration* mg/nm^3				
	2001	2002	2003	2004	2005
004B	1.75	<1.4	<4	<1.1	<5.0
005B	2.11	<1.9	<3	<2.5	<4.7
006B	2.33	<1.7	<3	2.3	<6.0
007B	1.95	<1.9	<4	<2.3	<6.0
008B	9.47	<1.9	<4	2.7	<6.7

Table E2 Mass Emissions to Atmosphere 2001-2005

Emission Point	TOC Mass Emission kg/h				
	2001	2002	2003	2004	2005
004B	0.008	<0.008	<0.018	<0.005	<0.022
005B	0.012	<0.012	<0.016	<0.014	<0.026
006B	0.015	<0.011	<0.019	0.013	<0.035
007B	0.010	<0.010	<0.020	<0.012	<0.031
008B	0.034	<0.012	<0.015	0.011	<0.02
Total Annual Mass Emission	**151.7kg**	**101.8kg**	**168.9kg**	**88.0kg**	**160.8kg**

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5.0 BAT Evaluation

There is no emission limit value for any of the licensed emission points. In instances where there is no statutory or licence limits applicable, the results can be compared with typical emission limit values (ELVs) taken from BATNEEC Guidance Notes (published by the EPA)[1]. This Guidance Note for textile finishing activities provides a concentration ELV of 50 mg/Nm^3, which becomes applicable when the mass emission exceeds 1kg/h. However, the combined mass emission from the five emission points is less than 1kg/h, at < 0.134 kg/hr.

[1] This Guidance Note is still valid as to date no BAT Guidance Notes for the textile industry have been published by the EPA

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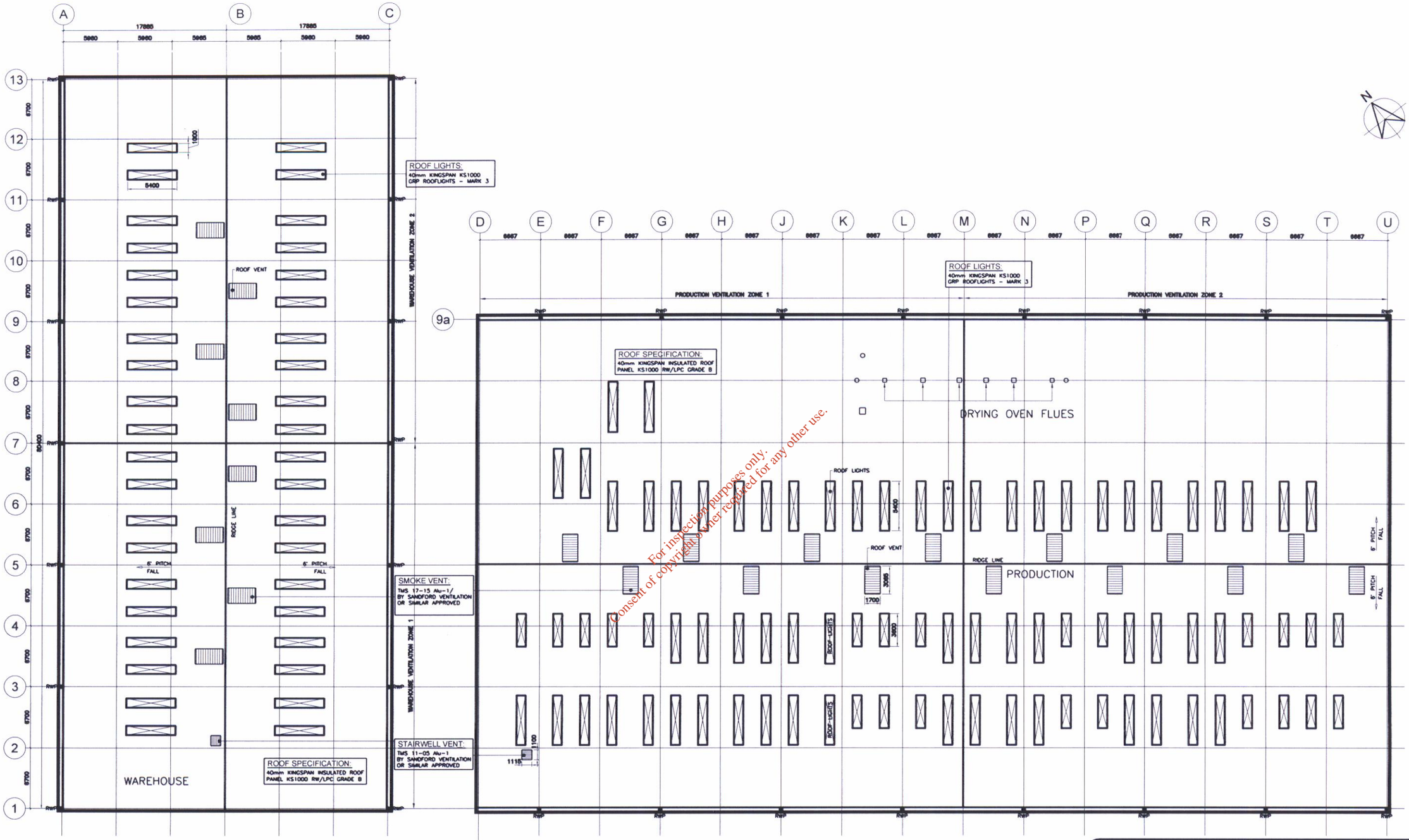

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NOTE:
EXCEPTING STAIRWELL VENTS, THE SMOKE VENTS SIZE, ORIENTATION, NUMBER AND LAYOUT ARE INDICATIVE. ALTERNATIVES MAY BE PROPOSED FOR CONSIDERATION THE VENT SIZE, ORIENTATION AND FIXING SHALL AS FAR PRACTICABLE SUIT THE PURLIN SPACING

MALONE O'REGAN
CONSULTING ENGINEERS

2B Richview Office Park,
Clonskeagh,
DUBLIN 14.
Tel: +353 1 260 2655
Fax: +353 1 260 2660
Email: info@morce.ie

St. Catherine's House,
Catherine Street
WATERFORD
Tel: +353 51 876 855
Fax: +353 51 876 828
Email: info@waterford.morce.ie

Client	Drawing
CURRAGH CARPETS	ATMOSPHERIC EMISSION POINTS
Job: IPPC LICENCE APPLICATION	

Job Number	Drawing Number	Sht. Size	Scale	Date	Drawn
E0351	E.1.1	A3	NTS	OCT '05	

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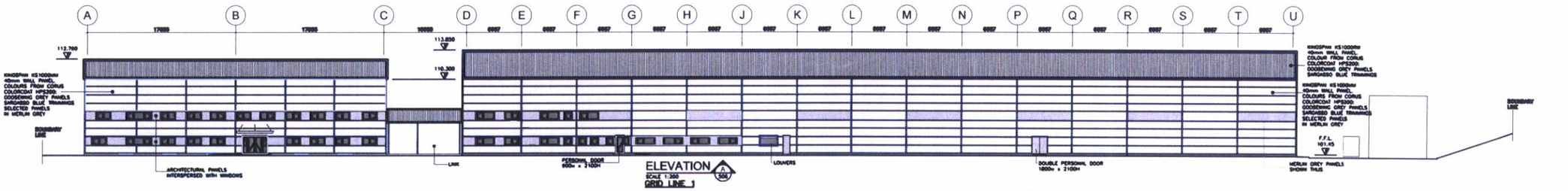

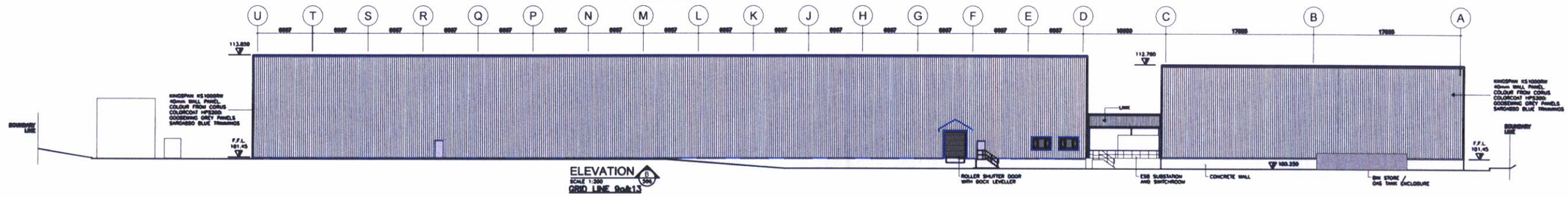

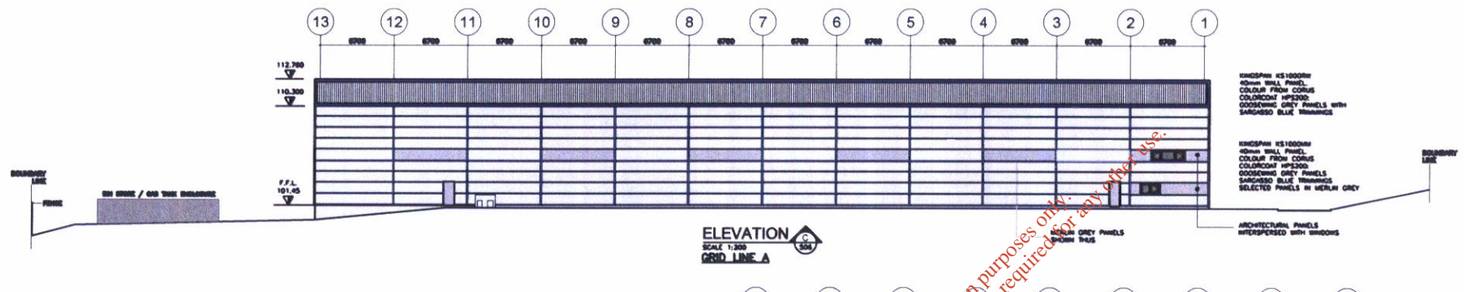

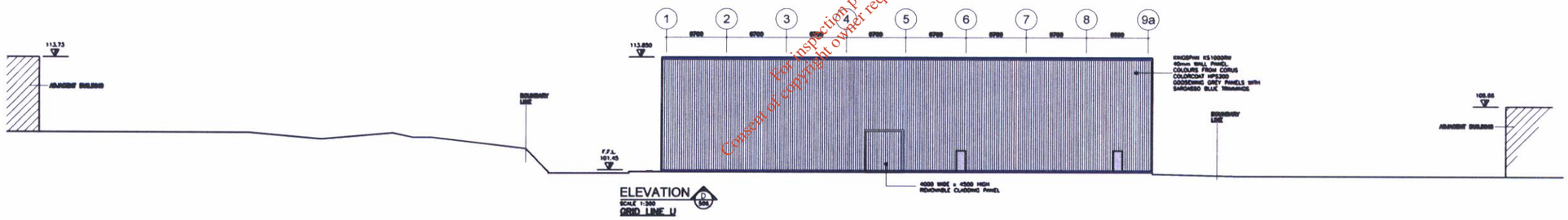

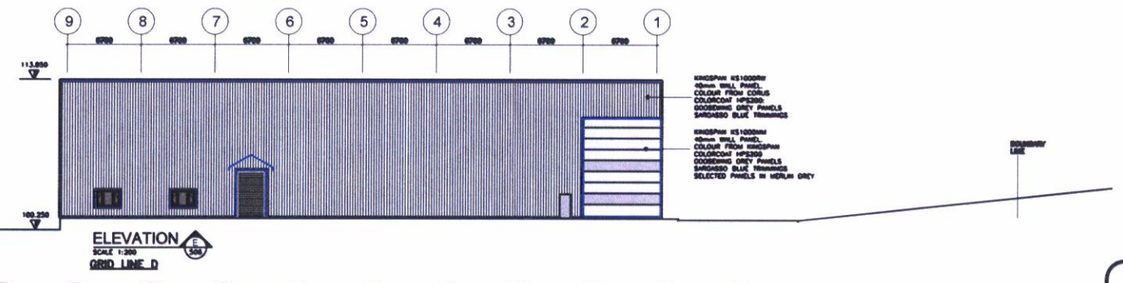

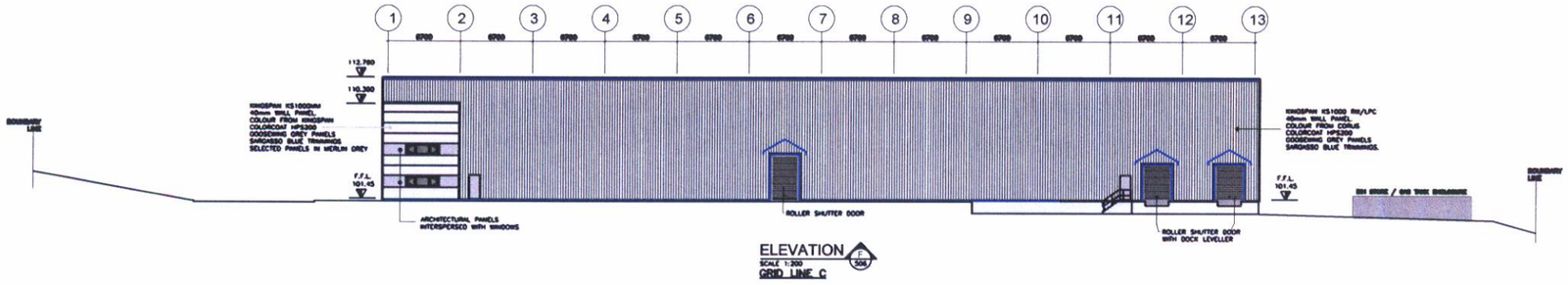

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MALONE O'REGAN CONSULTING ENGINEERS

2B Richview Office Park, Clonskeagh, DUBLIN 14.
Tel: +353 1 260 2655
Fax: +353 1 260 2660
Email: info@morce.ie

St. Catherine's House, Catherine Street WATERFORD
Tel: +353 51 876 855
Fax: +353 51 876 828
Email: info@waterford.morce.ie

Client	Drawing
CURRAGH CARPETS	ELEVATIONS
Job: IPPC LICENCE APPLICATION	

Job Number	Drawing Number	Sht. Size	Scale	Date	Drawn
E0351	E.1.2	A3	NTS	OCT '05	

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1. Introduction

Moloney & Associates were commissioned by Mr. John Barry to undertake an atmospheric emission monitoring programme at the Curragh Tintawn Carpets Ltd. facility in Newbridge, Co. Kildare.

The emission monitoring work was undertaken at the Drying Ovens' exhaust stacks in order to determine the concentration and mass emission of volatile organic compounds (VOCs).

This monitoring work is required under the terms and conditions of the Curragh Tintawn Carpets Ltd. IPC licence (Reg. No. 233).

This report describes the sampling and analytical methodology which was followed and additionally presents and interprets the monitoring results.

2. Atmospheric Emission Monitoring

Sampling at the Drying Ovens' exhaust stacks was conducted on the 11th of April 2005. The emissions to atmosphere from five licensed emission points were determined in accordance with the IPC licence requirements.

Table 1: Curragh Tintawn Carpets Ltd. - Licensed Atmospheric Emission Points:

Drying Oven-Stack Number	*Emission Point Reference No.*
1	004B
2	005B
3	006B
4	007B
5	008B

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The sampling and analytical methodologies were based on NIOSH method 1550. Samples were taken by drawing measured volumes of gas through glass tubes and then onto sorbent collecting tubes (Coconut Charcoal) over periods of approximately 12 - 30 minutes. The sampling periods were chosen to represent normal working conditions. Two separate samples were collected at each of the emission points.

The collected samples were dispatched to the RPS laboratory (Salford, U.K.) for analysis. The samples were initially desorbed using carbon disulphide and analysed for Total Organic Carbon (TOC) using gas chromatography with a flame ionisation detector. The TOC was reported by RPS as toluene, i.e. the total of all chromatographic peaks was expressed as toluene.

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3. Atmospheric Emission Monitoring Results

Temperature measurements were made at the five emission points using a thermocouple type digital thermometer. The average gas velocity was determined at each of the sampling points by using a Pitot static tube and a micro-manometer. This was achieved by taking a series of traverses based upon procedures outlined in BS 1042. The average gas velocity and the cross-sectional area of the exhaust ducts were used to calculate the volumetric flow rates at each emission point.

The analytical results have been converted to standard reference conditions (temperature 273° K and pressure of 101.3 kPa). The analytical results are presented in Appendix I of this report. Details of the duct and gas flow conditions are also presented in Appendix I.

The analytical results for most of the TOC samples were below the limit of detection (20 micrograms per tube). In instances where the concentration of a sample is below the reported analytical limit of detection the results are reported as a 'less than figure (<)'. A summary of the maximum emission determined at each emission point is presented below:

Table 2: Summary of Maximum Emissions

Emission Point	*TOC* CONCENTRATION* mg/Nm^3	*TOC MASS EMISSION* *kg/h*
004B	< 5.0	< 0.022
005B	< 4.7	< 0.026
006B	< 6.0	< 0.035
007B	< 6.0	< 0.031
008B	< 6.7	< 0.02

* Note: TOC as toluene

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The complete atmospheric monitoring results are presented in Appendix I of this report.

4. Conclusion

There is no known emission limit value for any of the licensed emission points. In instances where there is no statutory or licence limits applicable, the results can be compared with typical emission limit values (ELVs) taken from BATNEEC Guidance Notes (published by the Environmental Protection Agency). Although these limits are not legally binding, the 1997 BATNEEC Guidance Note for Textile Finishing activities provides a concentration ELV of 50 mg/Nm^3. This limit value generally becomes applicable when the mass emission exceeds 1 kg/h.

The concentration of VOC in each of the five stacks ranged from < 2.6 to < 6.7 mg/Nm^3. However, the combined mass emission from the five emission points is less than 1 kg/h. Thus, the reported emissions are so low that the ELV is not applicable. Nonetheless, all of the reported emissions are substantially lower than the concentration ELV which applies to Textile Finishing activities.

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APPENDIX I

Table A:

Emission Monitoring Results.

Table B:

Duct and Gas Flow Conditions.

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Table A. Emission Monitoring Results (sampled on 11th of April 2005)

Emission Point	*Sampling Period*	*TOC Concentration Mg/Nm³*	*TOC Mass Emission kg/h*
004B	14:52 – 15:22	< 2.7	< 0.012
004B	15:23 – 15:39	< 5.0	< 0.022
005B	14:56 – 15:26	< 2.6	< 0.015
005B	15:27 – 15:44	< 4.7	< 0.026
006B	15:03– 15:33	< 2.8	< 0.016
006B	15:34 – 15:48	< 6.0	< 0.035
007B	15:07 – 15:37	< 2.6	< 0.014
007B	15:38 – 15:51	< 6.0	< 0.031
008B	15:11 – 15:41	< 2.7	< 0.009
008B	15:41 – 15:53	< 6.7	< 0.02

*** Note:** **TOC as toluene**

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Table B: Duct and Gas Flow Conditions (sampled on 11th of April 2005)

Parameter Measured	***Emission Point***				
	004B	*005B*	*006B*	*007B*	*008B*
Duct Diameter (m)	0.49	0.55	0.55	0.55	0.49
Gas Temperature °C	96	98	104	101	104
Gas Velocity m/s	8.8	8.8	9.3	8.3	7.1
Gas Flow Nm^3/h	4420	5548	5770	5191	3491

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Attachment E.2

Emissions to Surface Water

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1.0 Details of Emissions to Surface Water

Emissions to surface water from the Curragh Tintawn Carpets Limited site will be limited to surface runoff from the site. The production processes at the site generate an aqueous trade effluent derived from the washing of latex products. Domestic effluent generated from the canteen and toilets on site will drain to the municipal sewerage system. Effluent from latex washings will be stored for collection by an authorised waste disposal contractor.

Surface water

Surface water incorporates building roof and ground run-off from the following sources at the Curragh Tintawn Carpets Limited facility:

- Buildings;
- Roads and concrete yard areas;
- Paved carparks;

The surface water run off will collected and drained to a 450mm diameter surface water public sewer located on the estate road on the northern corner of the site via a petrol interceptor. Attenuation of stormwater will be provided in accordance with the Dublin City Council's *"Stormwater Management Policy for Developers"*.

The gravity drainage system proposed will be constructed with concrete, vitrified clay ware pipes or plastic laid in accordance with relevant standards and the Building Regulations, Section H. All works within public areas will be in accordance to the requirements of Kildare County Council.

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2.0 Impervious Areas

The impervious area on site is calculated using impermability factors. Impermeability factors have been assigned to the plant building etc. The total area which drains into the surface system is approximately 16,497m^2.

The following areas have been determined to be impermeable:

- Buildings: 8,283 m^2
- Concrete areas: 4,503 m^2
- Tarmacadam areas: 3,059 m^2
- Stone Gravel areas: 315 m^2

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3.0 List I and List II substances

Sufficient abatement and control on site will be provided in the form of an oil/petrol interceptor to ensure that the final discharge does not contain significant quantities of oils and grease prior to entering the public surface water sewer. It is also significant to note that production activities will not generate process trade effluent, which will further minimise the potential for any process chemicals entering the surface water discharge from the site.

Site emissions to surface water will comprise solely of surface run-off which will drain to the River Liffey via the surface water public sewer. The final discharge to the River Liffey may contain trace quantities of some of the List I substances listed in the Annex to EU Directive 76/464/EEC (as amended) and the pollutants listed in the Schedule of the EPA (Licensing)(amendment) Regulations 2004 (S.I. No. 394 of 2004) due to the parking of motor vehicles on the site. List I substances include oils, fats and grease, fluoride, ammonia, nitrites and nitrates. The Schedule of the EPA (Licensing)(amendment) Regulations 2004 (S.I. No. 394 of 2004) includes materials in suspension. The final discharge will therefore receive treatment prior to release but may still contain trace quantities of List I substances.

4.0 BAT Considerations

Curragh Tintawn Carpets consider that the drainage of storm water to a public storm water sewer via an oil/petrol interceptor is BAT for the industry.

5.0 Potential Contamination

To prevent incidents and spillages on-site, controls on the storage and handling of chemicals and oils will be implemented, in conjunction with procedures for responding to emergencies and incidents. Bunded storage will be provided for all tanks containing liquids likely to pose a risk to the environment. Procedures, including site Emergency Response Procedures are further detailed in Attachment J.1.

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6.0 Weather Data

The Curragh Carpets facility will be located in Newbridge, Co. Kildare, which is a relatively low lying inland area on the eastern side of the country located away from the country's most predominant climatic influence, the Atlantic Ocean. The main characteristics of the climate are a decrease of precipitation and a slight increase of temperature variance as compared to more costal locations in Ireland.

Meteorological data (30 year averages) for Casement Aerodrome, which is located approximately 25km north west east of the Curragh Carpets site, is summarised below:

The maximum quantity of surface water arising on site is calculated as follows:
Average Daily Surface Runoff = Greatest daily total (net average) (mm) x Impervious site area;

$= 108 \text{ mm} \times 16{,}497 \text{m}^2$
$= 1782 \text{m}^3 / \text{day}$

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The average daily total is taken from Met Eireann data (30 year met data for Casement Aerodrome).

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Table E.2.6 Met Eireann Weather Data for Casement Aerodrome

CASEMENT AERODROME

monthly and annual mean and extreme values

1968-1996

TEMPERATURE *(degrees Celsius)*	*jan*	*feb*	*mar*	*apr*	*may*	*jun*	*jul*	*aug*	*sep*	*oct*	*nov*	*dec*	*year*
mean daily max.	7.8	7.6	9.6	11.8	14.6	17.7	19.7	19.3	16.8	13.6	9.9	8.3	**13.1**
mean daily min.	2.0	1.7	2.5	3.2	5.7	8.6	10.7	10.3	8.5	6.7	3.6	2.8	**5.5**
mean	4.9	4.6	6.0	7.5	10.1	13.1	15.2	14.8	12.6	10.1	6.7	5.6	**9.3**
absolute max.	15.4	14.7	18.8	21.3	24.7	27.5	29.8	30.5	24.7	21.3	17.7	15.4	**30.5**
absolute min.	-12.4	-10.3	-7.8	-4.5	-3.0	0.3	2.5	2.5	-0.3	-4.1	-6.2	-9.7	**-12.4**
mean no. of days with air frost	7.5	7.7	6.3	4.9	1.0	0.0	0.0	0.0	0.0	1.4	5.9	6.6	**41.3**
mean no. of days with ground frost	15.3	15.0	13.1	12.8	6.3	1.1	0.1	0.1	1.6	4.5	11.0	13.5	**94.3**
RELATIVE HUMIDITY *(%)*													
mean at 0900UTC	87	86	84	80	77	77	79	81	84	86	87	87	**83**
mean at 1500UTC	82	77	72	68	68	68	68	68	71	76	81	83	**74**
SUNSHINE *(hours)*													
mean daily duration	1.63	2.38	3.04	4.85	5.65	5.63	5.01	4.83	4.04	3.07	2.16	1.42	**3.64**
greatest daily duration	8.1	9.2	10.9	13.6	15.4	16.0	15.4	14.4	12.3	9.8	8.5	6.9	**16.0**
mean no. of days with no sun	10	7	5	2	2	2	1	2	3	5	7	11	**55**
RAINFALL *(mm)*													
mean monthly total	68.7	50.7	53.8	49.9	56.6	53.0	48.9	63.7	58.7	67.2	67.2	73.1	**711.4**
greatest daily total	31.4	42.8	30.0	35.3	34.3	108.6	41.4	73.0	32.1	48.5	58.4	42.9	**108.6**
mean no. of days with >= 0.2mm	18	14	17	14	15	14	14	14	15	16	16	17	**185**
mean no. of days with >= 1.0mm	13	10	12	10	11	10	9	10	10	11	11	12	**131**
mean no. of days with >= 5.0mm	5	3	3	3	4	3	3	4	4	4	4	5	**45**
WIND *(knots)*													
mean monthly speed	14.1	12.5	12.8	10.1	9.1	8.7	8.9	8.7	10.1	11.2	12.3	13.3	**11.0**
max. gust	80	78	71	59	63	53	58	58	69	65	68	81	**81**
max. mean 10-minute speed	57	54	47	43	43	36	39	39	46	44	49	57	**57**
mean no. of days with gales	5.2	2.7	2.7	0.6	0.5	0.1	0.1	0.2	0.6	1.4	2.4	3.7	**20.3**
WEATHER *(mean no. of days with..)*													
snow or sleet	4.6	4.8	3.5	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.1	**16.9**
snow lying at 0900UTC	2.4	1.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	**5.3**
hail	0.8	1.2	2.8	2.2	1.3	0.5	0.1	0.1	0.3	0.1	0.7	0.6	**10.7**
thunder	0.0	0.1	0.2	0.3	0.9	0.9	0.8	0.6	0.3	0.2	0.2	0.1	**4.8**
fog	2.5	2.3	1.8	2.4	1.6	1.4	1.2	2.8	2.9	2.7	1.8	2.3	**25.9**

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7.0 2004 Surface Water Monitoring Summary

Results for the visual inspection of surface water discharges for 2004 from the existing Curragh Tintawn Carpets facility are presented in Table E.2.7 below.

Table E.2.7 Results of Monitoring Point SW 1, 2004.

Date	Observation	Date	Observation
07/01/04	Clear	17/06/04	Clear
15/01/04	Clear	25/06/04	Clear
22/01/04	Clear	13/07/04	Dry
27/01/04	Clear	21/07/04	Dry
04/02/04	Dry	11/08/04	Clear
11/02/04	Clear	19/08/04	Clear
19/02/04	Dry	27/08/04	Dry
25/02/04	Dry	06/09/04	Dry
02/03/04	Dry	14/09/04	Dry
09/03/04	Clear	22/09/04	Clear
17/03/04	Dry	30/09/04	Clear
30/03/04	Dry	04/10/04	Dry
06/04/04	Clear	12/10/04	Clear
14/04/04	Clear	21/10/04	Clear
20/04/04	Clear	28/10/04	Clear
30/04/04	Dry	10/11/04	Clear
04/05/04	Dry	18/11/04	Dry
11/05/04	Dry	23/11/04	Dry
18/05/04	Clear	30/11/04	Clear
28/05/04	Clear	06/12/04	Clear
02/06/04	Dry	14/12/04	Dry
10/06/04	Dry	17/12/04	Clear

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Attachment E.3

Emissions to Sewer

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1.0 Details of Emissions to Sewer

Emissions to sewer from the Curragh Tintawn Carpets Limited site will be limited to sanitary effluents only. The production processes at the site will generate an aqueous trade effluent derived from the washing of latex products however this will be pumped to a bunded storage tank for collection by an authorised waste disposal contractor. Sanitary effluent in the form of domestic effluent generated from the canteen and toilets on site will drain to the municipal sewerage system. Storm water in the form of rain water run-off from the roof and non process areas will drain to a separate surface water public sewer.

Newbridge town's municipal sewerage system drain to a state of the art Upper Liffey Valley waste water treatment system, located at Osbertown.

2.0 List I and List II substances

Site emissions to the municipal sewerage system will comprise solely of sanitary effluents from on site toilets and canteen facilities provided for its 73 staff. The final discharge to the municipal sewer may contain trace quantities of some of the List I substances listed in the Annex to EU Directive 76/464/EEC (as amended) and the pollutants listed in the Schedule of the EPA (Licensing)(amendment) Regulations 2004 (S.I. No. 394 of 2004). List I substances include oils, fats and grease, fluoride, ammonia, nitrites and nitrates. The Schedule of the EPA (Licensing) (amendment) Regulations 2004 (S.I. No. 394 of 2004) includes materials in suspension.

It is significant to note that production activities will not generate process trade effluent, which will further minimise the potential for any process chemicals entering the sewage discharge from the site.

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3.0 BAT Considerations

Curragh Tintawn Carpets consider that the drainage of sanitary effluent to a municipal sewer is BAT for the industry.

4.0 Potential Contamination

To prevent incidents and spillages on-site, there are controls on the storage and handling of chemicals and oils, in conjunction with procedures for responding to emergencies and incidents. Bunded storage will be provided for all tanks containing liquids likely to pose a risk to the environment. Procedures, including site Emergency Response Procedures are further detailed in Attachment J.1.

5.0 2004 Sewage Monitoring Summary

Current Monitoring Requirements

Parameter	Emission Limit Values	Monitoring Frequency[1]
Temperature (^{0}C)	Max. 22 ^{0}C	Quarterly
pH (pH units)	6.0 - 9.0	Quarterly

[1] Emissions to sewer are normally tested quarterly; however monitoring took place three times in 2004 due to scheduling difficultles.

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COD (mg 1^{-1})	Max. 400 mg/l	Quarterly
BOD (mg 1^{-1})	Max. 100 mg/l	Quarterly
TSS (mg 1^{-1})	Max. 100 mg/l	Quarterly
Sulphates (as SO_4)(mg 1^{-1})	Max. 500 mg/l	Quarterly
Oils Fats Greases (mg 1^{-1})	Max. 50 mg/l	Quarterly
Aluminium	-	Annually

Table E.3.2 Emissions to Sewer EP01 Monitoring Results (January - December 2004)

Parameter	9th March	20th April	22nd July	Emission Limit Value[2]
Temperature[3] (^{0}C)	-	-	-	Max. 22 ^{0}C
pH (pH units)	7.4	7.5	**9.48**	6.0 - 9.0
BOD (mg/l)	6	5	<40	Max. 100 mg/l
COD (mg/l)	**795**	**1360**	258	Max. 400 mg/l
TSS (mg/l)	52	**101**	20	Max. 100 mg/l
Sulphates (as SO_4, mg/l)	33.2	40	108	Max. 500 mg/l
Oils Fats Greases (mg/l)	10	25	0.43	Max. 50 mg/l
Aluminium	-	-	-	-

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6.0 Request for Modification in Monitoring Parameters.

In light of the elimination of the use of an on site waste water treatment using aluminium sulphate at the new facility, Curragh Tintawn Carpets Limited request that the requirement to test for aluminium and sulphates is removed from any new licence. In light of the fact that the discharge to sewer will consist solely of sanitary effluent without treatment it is additionally requested that the BOD, COD and suspended solids limits be increased to the typical values associated with untreated domestic effluent as discharged to sewer i.e. 216- 540mg/l BOD and 240-600mg/l for suspended solids.

[2] **Bold** = Above Limit Value

[3] Due to human error temperature and aluminium testing were omitted from the sampling procedure in 2004.

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