

## APPENDIX 8A

**Table 8.1 Air Quality Standards Regulations 2011 (Based on Directive 2008/50/EC and S.I. 180 of 2011)**

Pollutant	Regulation <small>Note 1</small>	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200 $\mu\text{g}/\text{m}^3$ NO <sub>2</sub>
		Annual limit for protection of human health	40% until 2003 reducing linearly to 0% by 2010	40 $\mu\text{g}/\text{m}^3$ NO <sub>2</sub>
		Annual limit for protection of vegetation	None	30 $\mu\text{g}/\text{m}^3$ NO + NO <sub>2</sub>
Lead	2008/50/EC	Annual limit for protection of human health	100%	0.5 $\mu\text{g}/\text{m}^3$
Sulphur dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	150 $\mu\text{g}/\text{m}^3$	350 $\mu\text{g}/\text{m}^3$
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125 $\mu\text{g}/\text{m}^3$
		Annual & Winter limit for the protection of ecosystems	None	20 $\mu\text{g}/\text{m}^3$
Particulate Matter (as PM <sub>10</sub> )	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50%	50 $\mu\text{g}/\text{m}^3$ PM <sub>10</sub>
		Annual limit for protection of human health	20%	40 $\mu\text{g}/\text{m}^3$ PM <sub>10</sub>
PM <sub>2.5</sub> (Stage 1)	2008/50/EC	Annual limit for protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25 $\mu\text{g}/\text{m}^3$ PM <sub>2.5</sub>
PM <sub>2.5</sub> (Stage 2) <sup>Note 2</sup>	-	Annual limit for protection of human health	None	20 $\mu\text{g}/\text{m}^3$ PM <sub>2.5</sub>
Benzene	2008/50/EC	Annual limit for protection of human health	100% until 2006 reducing linearly to 0% by 2010	5 $\mu\text{g}/\text{m}^3$
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 $\text{mg}/\text{m}^3$ (8.6 ppm)

<sup>Note 1</sup> EU 2008/50/EC – Clean Air For Europe (CAFÉ ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Note 2 EU 2008/50/EC states - 'Stage 2 — indicative limit value to be reviewed by the Commission in 2013 in the light of further information on health and environmental effects, technical feasibility and experience of the target value in Member States'.

**Table 8.2 Previous European Union Air Standards (Superseded by 1999/30/EC and 2000/69/EC)**

Pollutant	Regulation	Type	Period	Value
Nitrogen Dioxide	85/203/EEC	Limit Value	98th percentile of yearly mean hourly concentrations	200 $\mu\text{g}/\text{m}^3$
		Guide Value		135 $\mu\text{g}/\text{m}^3$
		Guide Value	50th percentile of yearly mean hourly concentrations	50 $\mu\text{g}/\text{m}^3$
Lead	82/884/EEC	Limit Value	Annual mean	2 $\mu\text{g}/\text{m}^3$
Sulphur dioxide	80/779/EEC	Limit Value	98th percentile of yearly mean hourly concentrations	250-350 <sup>Note 1</sup> $\mu\text{g}/\text{m}^3$
		Limit Value	Winter (medium of daily values)	130 or 180 <sup>Note 1</sup> $\mu\text{g}/\text{m}^3$
		Limit Value	One year (medium of daily values)	80 or 120 <sup>Note 1</sup> $\mu\text{g}/\text{m}^3$
		Guide Value	98th percentile of yearly mean hourly concentrations	135 $\mu\text{g}/\text{m}^3$
		Guide Value	50th percentile of 1-hour means	50 $\mu\text{g}/\text{m}^3$
Smoke	80/779/EEC	Limit Value	One year (medium of daily values)	80 $\mu\text{g}/\text{m}^3$
		Limit Value	Winter (medium of daily values)	130 $\mu\text{g}/\text{m}^3$
		Limit Value	98th percentile of daily values	250 $\mu\text{g}/\text{m}^3$

<sup>Note 1</sup> The lower daily values refer to the situation with corresponding high levels of black smoke.

**Table 8.3 US National Ambient Air Quality Standards (NAAQS) & PSD Increments**

Pollutant	Averaging Period	Primary & Secondary Standard <sup>Note 1</sup> ( $\mu\text{g}/\text{m}^3$ )	PSD Increment Class II <sup>Note 2</sup> ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	Annual – Average over 3 years	50	17
	24-Hour – as a 99 <sup>th</sup> percentile over 3 years	150	30
NO <sub>2</sub>	Annual Mean	100	25
CO	8-Hour – 3-year average of annual 4 <sup>th</sup> highest daily maximum 8-hour conc.	10,000	-
	1-Hour – not to be exceeded more than 3 times in 3 consecutive years	40,000	-
Hydrocarbon (Benzene)	3 Hours (6-9 AM) (corrected for methane)	160	-

<sup>Note 1</sup> Primary standards to protect public health whilst secondary standards are set to protect public welfare

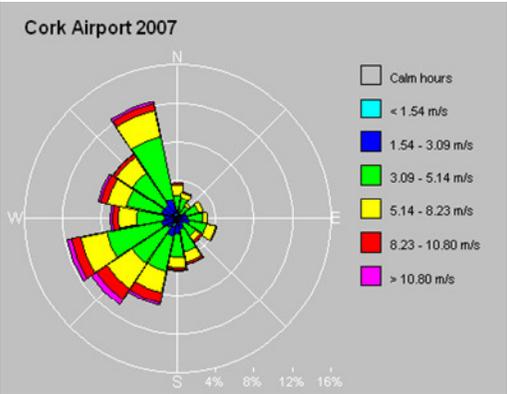
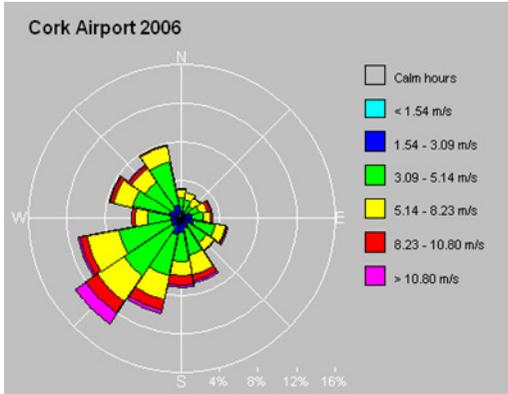
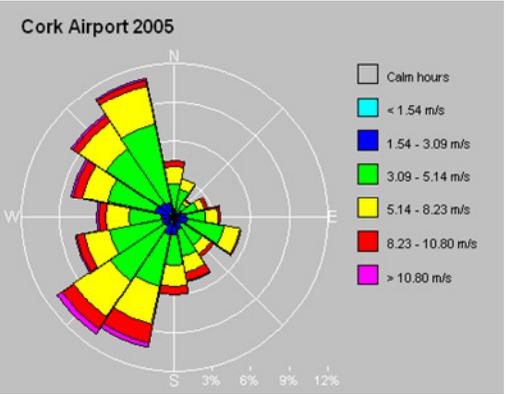
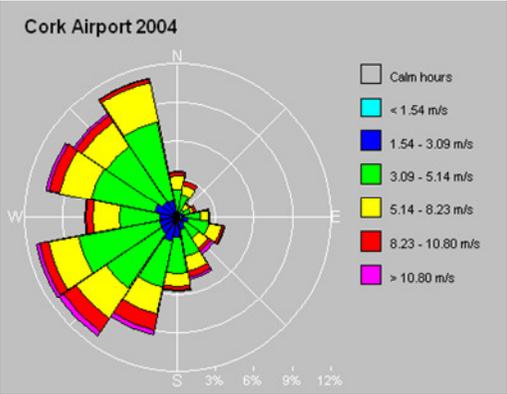
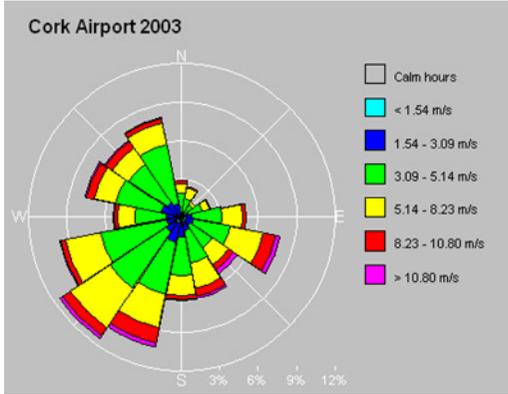
<sup>Note 2</sup> Class I areas are national parks and similar areas. Class II are all areas not originally classified as Class I.

**Table 8.4 WHO Air Quality Guidelines 1999**

Substances	Time-weighted Average	Averaging Time
Lead	0.5-1.0 $\mu\text{g}/\text{m}^3$	1 year
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$	1 hour
	40-50 $\mu\text{g}/\text{m}^3$	annual
Carbon monoxide	100 $\mu\text{g}/\text{m}^3$	15 minutes
	60 $\mu\text{g}/\text{m}^3$	30 minutes
	30 $\mu\text{g}/\text{m}^3$	1 hour
	10 $\mu\text{g}/\text{m}^3$	8 hour
Benzene	<sup>Note 1</sup>	
Particulate matter (PM <sub>10</sub> )	<sup>Note 2</sup>	

<sup>Note 1</sup> No safe level recommended owing to carcinogenicity.

<sup>Note 2</sup> No specific guideline recommended because no obvious exposure concentration and duration that could be judged a threshold and decreased by uncertainty factors to avoid risk.



**Project**  
Bandon Flood Relief Scheme

**Reference**  
12/5847AR01

**Figure 8.1**  
Cork Airport Windrose 2003 - 2007

## **Ambient Air Quality Standards**

National standards for ambient air pollutants in Ireland have generally ensued from Council Directives enacted in the EU (& previously the EC & EEC) (see Table 8.1 & 8.2). The initial interest in ambient air pollution legislation in the EU dates from the early 1980s and was in response to the most serious pollutant problems at that time. In response to the problem of acid rain, sulphur dioxide and later nitrogen dioxide were both the focus of EU legislation. Linked to the acid rain problem was urban smog associated with fuel burning for space heating purposes. Also apparent at this time were the problems caused by leaded petrol and EU legislation was introduced to deal with this problem in the early 1980s.

In recent years the EU has focused on defining a basis strategy across the EU in relation to ambient air quality. In 1996, a Framework Directive, Council Directive 96/62/EC, on ambient air quality assessment and management was enacted. The aims of the Directive are fourfold. Firstly, the Directive's aim is to establish objectives for ambient air quality designed to avoid harmful effects to health. Secondly, the Directive aims to assess ambient air quality on the basis of common methods and criteria throughout the EU. Additionally, it is aimed to make information on air quality available to the public via alert thresholds and fourthly, it aims to maintain air quality where it is good and improve it in other cases.

As part of these measures to improve air quality, the European Commission has adopted proposals for daughter legislation under Directive 96/62/EC. The first of these directives to be enacted, Council Directive 1999/30/EC, was passed into Irish Law as S.I. No 271 of 2002 (Air Quality Standards Regulations 2002), and has set limit values which came into operation on 17<sup>th</sup> June 2002. The Air Quality Standards Regulations 2002 detail margins of tolerance, which are trigger levels for certain types of action in the period leading to the attainment date. The margin of tolerance varies from 60% for lead, to 30% for 24-hour limit value for PM<sub>10</sub>, 40% for the hourly and annual limit value for NO<sub>2</sub> and 26% for hourly SO<sub>2</sub> limit values. The margin of tolerance commenced from June 2002, and will start to reduce from 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by the attainment date. A second daughter directive, EU Council Directive 2000/69/EC, details limit values for both carbon monoxide and benzene in ambient air. This has also been passed into Irish Law under the Air Quality Standards Regulations 2002. The most recent EU Council Directive on ambient air quality was published on the 11/06/08. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive and its subsequent daughter directives. Council Directive 2008/50/EC, was passed into Irish Law as S.I. No 180 of 2011 (Air Quality Standards Regulations 2011). Provisions were also made for the inclusion of new ambient limit values relating to PM<sub>2.5</sub>. The margin of tolerance specific to each pollutant was also slightly adjusted from previous directives as outlined in Table 8.1.

Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions. The Alert Threshold is defined in Council Directive 2008/50/EC as "a level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken as laid down in Directive 2008/50/EC". These steps include undertaking to ensure that the necessary steps are taken to inform the public (e.g. by means of radio, television and the press).

The Margin of Tolerance is defined in Council Directive 2008/50/EC as a concentration which is higher than the limit value when legislation comes into force. It decreases to meet the limit value by the attainment date. The Upper Assessment Threshold is defined in Council Directive 2008/50/EC as a concentration above which high quality measurement is mandatory. Data from measurement may be supplemented by information from other sources, including air quality modelling.

An annual average limit for both NO<sub>x</sub> (NO and NO<sub>2</sub>) is applicable for the protection of vegetation in highly rural areas away from major sources of NO<sub>x</sub> such as large conurbations, factories and high road vehicle activity such as a dual carriageway or motorway. Annex III of EU Directive

2008/50/EC identifies that monitoring to demonstrate compliance with the NO<sub>x</sub> limit for the protection of vegetation should be carried out distances greater than:

- 5 km from the nearest motorway or dual carriageway
- 5 km from the nearest major industrial installation
- 20 km from a major urban conurbation

As a guideline, a monitoring station should be indicative of approximately 1000 km<sup>2</sup> of surrounding area.

Under the terms of EU Framework Directive on Ambient Air Quality (96/62/EC), geographical areas within member states have been classified in terms of zones. The zones have been defined in order to meet the criteria for air quality monitoring, assessment and management as described in the Framework Directive and Daughter Directives. Zone A is defined as Dublin and its environs, Zone B is defined as Cork City, Zone C is defined as 21 urban areas with a population greater than 15,000 and Zone D is defined as the remainder of the country. The Zones were defined based on among other things, population and existing ambient air quality.

EU Council Directive 96/62/EC on ambient air quality and assessment has been adopted into Irish Legislation (S.I. No. 33 of 1999). The act has designated the Environmental Protection Agency (EPA) as the competent authority responsible for the implementation of the Directive and for assessing ambient air quality in the State. Other commonly referenced ambient air quality standards include the World Health Organisation. The WHO guidelines differ from air quality standards in that they are primarily set to protect public health from the effects of air pollution. Air quality standards, however, are air quality guidelines recommended by governments, for which additional factors, such as socio-economic factors, may be considered