

L.N. 224 of 2001

**ENVIRONMENT PROTECTION ACT, 2001
(ACT NO. XX OF 2001)**

**Limit Values for Nitrogen Dioxide, Sulphur Dioxide
and Oxides of Nitrogen, Particulate Matter and Lead
in Ambient Air Regulations, 2001**

BY virtue of the powers conferred by articles 3, 9, 11 and 28 of the Environment Protection Act, 2001, the Minister for the Environment has made the following regulations:

1. (1) The title of these regulations is the Limit Values for Nitrogen Dioxide, Sulphur Dioxide and Oxides of Nitrogen, Particulate Matter and Lead in Ambient Air Regulations, 2001. Citation and entry into force.

(2) These regulations shall come into force on such date as the Minister for the Environment may by notice in the Gazette appoint, and different dates may be so appointed for different provisions and different purposes of these regulations.

(3) A notice under sub-regulation (2) of this regulation may make such transitional provisions as appear to the Minister to be made expedient in connection with the provisions thereby brought into force.

2. For the purpose of these regulations and unless the context otherwise requires: Definitions.

“agglomeration” means a zone with a population concentration in excess of 250,000 inhabitants or where the population concentration is 250,000 inhabitants or less, a population density per Km², which for the Member States justifies the need for ambient air quality to be assessed and managed;

“alert threshold” means a level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken by the competent authority as laid down in the Ambient Air Quality Assessment and Management Regulations, 2001;

“ambient air” means outdoor air in the troposphere, excluding work places;

“assessment” means any method used to measure, calculate, predict or estimate the level of a pollutant in the ambient air;

“competent authority” means the Department for Environment Protection under the guidance of the Director for Environment Protection and such other body of person as the Minister responsible for the environment may by order in the Gazette prescribe and different bodies or persons may be designated as a competent authority for different provisions and different purposes of the regulations;

“fixed measurements” means measurements taken in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001;

“level” means the concentration of a pollutant in ambient air or the deposition thereof on surfaces in a given time;

“limit value” means a level fixed on the basis of scientific knowledge, with the aim of avoiding, preventing or reducing harmful effects on human health and, or the environment as a whole, to be attained within a given period and not to be exceeded once attained;

“lower assessment threshold” means a level specified in Annex V, below which modelling or estimation techniques alone may be used to assess ambient air quality in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001;

“margin of tolerance” means the percentage of the limit value by which this value may be exceeded subject to the conditions laid down in the Ambient Air Quality Assessment and Management Regulations, 2001;

“natural events” means eruptions, seismic activities, geothermal activities, wild-land fires, high wind events or the atmospheric resuspension or transport of natural particles from dry regions;

“oxides of nitrogen” means the sum of nitric oxides and nitrogen dioxide added as parts per billion and expressed as nitrogen dioxide in micrograms per cubic meter;

“PM₁₀” shall mean particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at 10µm aerodynamic diameter;

“PM_{2.5}” shall mean particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at 2,5µm aerodynamic diameter;

“upper assessment threshold” means a level specified in Annex V [this Annex deals with the determination of regulations for assessment of concentrations of sulphur dioxide (SO₂), nitrogen dioxide (NO₂), and oxides of nitrogen (NO_x), particulate matter (PM₁₀) and lead in ambient air within a zone or agglomeration], below which a combination of measurements and modelling techniques may be used to assess ambient-air quality, in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001;

3. (1) The competent authority shall ensure that concentrations of sulphur dioxide in ambient air, as assessed in regulation 7, do not exceed the limit values laid down in Section 1 of Annex 1 provided that the margins of tolerance laid down in Section I of Annex 7 shall apply in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001. Sulphur Dioxide.

Provided that the alert threshold for concentrations of sulphur dioxide in ambient air shall be those that are laid down in Section II of Annex I.

(2) (a) The competent authority may designate zones or agglomerations within which limit values for sulphur dioxide as laid down in Section I of Annex I are exceeded owing to concentrations of sulphur dioxide in ambient air due to natural sources.

(b) Within such zones or agglomerations the competent authority shall be obliged to implement action plans in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001, only where the limit values laid down in Section I of Annex I are exceeded owing to man-made emissions.

4. (1) The competent authority shall take the measures necessary to ensure that concentrations of nitrogen dioxide and, where applicable, of oxides of nitrogen, in ambient air, as assessed in accordance with regulation 7, do not exceed the limit values laid down in Section 1 of Annex II as from the dates specified therein. Nitrogen Dioxide and oxides of Nitrogen.

Provided that the margins of tolerance laid down in Section 7 of Annex II shall apply in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001.

Provided further that, the alert threshold for concentrations of nitrogen dioxide in ambient air shall be that laid down in Section II of Annex II.

Particulate matter.

5. (1) The competent authority shall take the measures necessary to ensure that concentrations of PM_{10} in ambient air, as assessed in accordance with regulation 7, do not exceed the limit values laid down in Section I of Annex III as from the dates specified therein.

Provided that the margins of tolerance laid down in Section 1 of Annex III shall apply in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001.

(2) The competent authority shall ensure that measuring stations are installed and operated to supply data on concentrations of $PM_{2.5}$, and where possible sampling points for $PM_{2.5}$ shall be co-located with sampling points for PM_{10} .

(3) The competent authority shall prepare Action plans for PM_{10} in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001 and general strategies for decreasing concentrations of PM_{10} with the aim, also of reducing concentrations of $PM_{2.5}$.

(4) The competent authority shall implement action plans in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001 when the limit values for PM_{10} laid down in Section I of Annex III are exceeded owing to concentrations of PM_{10} in ambient air due to causes other than natural events which result in concentrations significantly in excess of normal background levels from natural sources.

(5) The competent authority may designate zones or agglomerations within which limit values for PM_{10} as laid down in Section I of Annex III are exceeded owing to concentrations of PM_{10} in ambient air due to the resuspension of particulates following the winter sanding of roads.

(6) The competent authority shall within such zones or agglomerations, be obliged to implement action plans in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001.

Lead.

6. (1) The competent authority shall take the measures necessary to ensure that concentrations of lead in ambient air, as assessed

in accordance with regulation 7, do not exceed the limit values laid down in Section 1 of Annex IV as from the dates specified therein.

Provided that the margins of tolerance laid down in Section 7 of Annex IV shall apply in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001.

7. (1) The upper and lower assessment thresholds for sulphur dioxide, nitrogen and oxides of nitrogen, particulate matter and lead for the purposes of the Ambient Air Quality Assessment and Management Regulations, 2001 shall be those laid down in Section 1 of Annex V. Assessment of concentrations.

Provided that the classification of each zone or agglomeration for the purposes of the same regulations shall be reviewed at least every five years in accordance with the procedure laid down in Section II of Annex V.

Provided further that classification shall be reviewed earlier in the event of significant changes in activities relevant to ambient concentrations of sulphur dioxide, nitrogen dioxide or, where relevant, oxides of nitrogen, particulate matter or lead.

(2) (a) The criteria for determining the location of sampling points for the measurement of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air shall be those listed in Annex VI.

(b) The minimum number of sampling points for fixed measurements of concentrations of each relevant pollutant shall be as laid down in Annex VII and the competent authority shall install sampling points in each zone or agglomeration within which measurement is required, if fixed measurement is the sole source of data on concentrations within it.

(3) The competent authority shall, in the case of concentrations of air pollutant in zones and agglomerations within which information from fixed measurement stations is supplemented by information from other sources, install a number of fixed measuring stations and assess the spatial resolution of other techniques in accordance with Section I of Annex VI and Section I of Annex VIII.

Provided that zones and agglomerations within which measurement is not required, modelling or objective estimation techniques may be used.

(4) (a) The competent authority shall adopt reference methods:

(i) for the analysis of sulphur dioxide, dioxide and oxides of nitrogen and for the sampling and analysis of lead as laid down in Sections I to III of Annex IX;

(ii) for the sampling and measurement of PM_{10} which shall be as laid down in Section IV of Annex IX.

(b) The competent authority shall adopt the provisional enforcement method for the sampling and measurement of $PM_{2.5}$ as laid down in Section V of Annex IX.

(c) The competent authority shall adopt the reference techniques for air-quality modelling as laid down in Section VI of Annex IX.

Public information.

8. (1) The competent authority shall ensure that up-to-date information on ambient concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead is routinely made available to the public as well as to appropriate organisations such as environmental organisations, consumer organisations, organisations representing the interests of sensitive populations and other relevant health-care bodies by means of the broadcasting media, the press, information screens or computer network services.

(2) When making plans or programmes available to the public under the Ambient Air Quality Assessment and Management Regulations, 2001, including plans or programmes referred to under regulations 3(2)(b) and 5(3)(4) of this regulation, the competent authority shall also make them available to the organisations referred to in sub-regulation (1) of this regulation.

(3) When an alert threshold laid down in Annex I or II is exceeded, the competent authority shall make available to the public in accordance with the Ambient Air Quality Assessment and Management Regulations, 2001, details which would include the items listed in Section III of the Annex in question.

(4) Information made available by the competent authority to the public and to organisations shall be clear, comprehensible and accessible.

Offences under these regulations.

9. Any person shall be guilty of an offence under these regulations if:

(a) he fails to comply with any order lawfully given in terms of any provision of these regulations; or

(b) he contravenes any restriction, prohibition or requirement imposed under these regulations.

10. Any person who commits an offence against these regulations shall, on conviction, be liable: Penalties.

(a) on a first conviction to a fine (*multa*) of not less than five hundred liri but not exceeding one thousand liri;

(b) on a second or subsequent convictions, to a fine (*multa*) of not less than one thousand Maltese liri, but not exceeding two thousand Maltese liri or to imprisonment for a term not exceeding two years, or to both such fine and imprisonment:

Provided that whenever any person is found guilty of committing an offence under these regulations by means of a vehicle, the owner of the said vehicle, where applicable, is held liable in the same manner and degree:

Provided further that the court shall order any person who has been found guilty of committing an offence against these regulations to pay for the expenses incurred by the public entities and/or other persons acting on their behalf involved in the implementation of these regulations and restitution of the environment as a result of the said offence, the revocation of the permit issued by the Police and the confiscation of the *corpus delicti*.

11. (1) The provisions of article 23 and subarticle (1) of article 30 of the Criminal Code shall, *mutatis mutandis*, apply to proceedings, in respect of offences against these regulations, so however that the disqualification from holding or obtain a licence, permit or authority shall in no case be for less than one year. Applicability of the Criminal Code.

(2) Notwithstanding the provisions of article 370 of the Criminal Code, proceedings for an offence against these regulations shall be taken before the Court of Magistrates (Malta) or the Court of Magistrates (Gozo), as the case may be, and shall be in accordance with the provisions of the Criminal Code regulating the procedure before the said courts as courts of criminal judicature.

(3) Notwithstanding the provisions of the Criminal Code, the Attorney General shall always have a right of appeal to the Court of Criminal Appeal from any judgement given by the Court of Magistrates (Malta) or the Court of Magistrates (Gozo) in respect of proceedings for any offence against these regulations.

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Language of
Annexes.

12. Annexes I to IX attached to these regulations shall be published in the English language with the English version of these regulations.

ANNEX I

LIMIT VALUES AND THE ALERT THRESHOLD FOR SULPHUR DIOXIDE**I. Limit values for sulphur dioxide**

Limit values shall be expressed in $\mu\text{g}/\text{m}^3$. The volume shall be standardised at a temperature of 293 °K and a pressure of 101,3 kPa.

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
1. Hourly limit value for the protection of human health	1 hour	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a calendar year	150 $\mu\text{g}/\text{m}^3$ (43%) on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005	1 January 2005
2. Daily limit value for the protection of human health	24 hours	125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a calendar year	None	1 January 2005
3. Limit value for the protection of ecosystems	Calendar year and winter (1 October to 31 March)	20 $\mu\text{g}/\text{m}^3$	None	19 July 2001

II. Alert threshold for sulphur dioxide

500 $\mu\text{g}/\text{m}^3$ measured over three consecutive hours at locations representative of air quality over at least 100 km² or an entire zone or agglomeration, whichever is the smaller.

III. Minimum details to be made available to the public when the alert threshold for sulphur dioxide is exceeded

Details to be made available to the public shall include at least:

- (a) the date, hour and place of the occurrence and the reasons for the occurrence, where known,
- (b) any forecasts of

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- (i) changes in concentrations (improvement, stabilisation, or deterioration), together with the reasons for those changes,
 - (ii) the geographical area concerned,
 - (iii) the duration of the occurrence;
- (c) the type of population potentially sensitive to the occurrence;
- (d) the precautions to be taken by the sensitive population concerned.

ANNEX II

**LIMIT VALUES FOR NITROGEN DIOXIDE (NO₂) AND OXIDES OF
NITROGEN (NO_x) AND THE ALERT THRESHOLD FOR NITROGEN
DIOXIDE**

I Limit values for nitrogen dioxide and oxides of nitrogen

Limit values shall be expressed in $\mu\text{g}/\text{m}^3$. The volume shall be standardised at a temperature of 293 °K and a pressure of 101,3 kPa.

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
1. Hourly limit value for the protection of human health	1 hour	200 $\mu\text{g}/\text{m}^3$ NO ₂ , not to be exceeded more than 24 times a calendar year	50 % on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2010	1 January 2010
2. Annual limit value for the protection of human health	Calendar year	40 $\mu\text{g}/\text{m}^3$ NO ₂	50 % on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2010	1 January 2010
3. Annual limit value for the protection of vegetation	Calendar year	30 $\mu\text{g}/\text{m}^3$ NO _x	None	19 July 2001

II. Alert threshold for nitrogen dioxide

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400 µg/m³ measured over three consecutive hours at locations representative of air quality over at least 100 km² or an entire zone or agglomeration, whichever is the smaller.

III. Minimum details to be made available to the public when the alert threshold for nitrogen dioxide is exceeded

Details to be made available to the public shall include at least:

- (a) the date, hour and place of the occurrence and the reasons for the occurrence, where known;
- (b) any forecasts of:
 - (i) changes in concentrations (improvement, stabilisation, or deterioration), together with the reasons for those changes,
 - (ii) the geographical area concerned,
 - (iii) the duration of the occurrence;
- (c) the type of population potentially sensitive to the occurrence;
- (d) the precautions to be taken by the sensitive population concerned.

ANNEX III

LIMIT VALUES FOR PARTICULATE MATTER (PM10)

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
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STAGE 1

1. 24-hour limit value for the protection of human health	24 hours	50 $\mu\text{g}/\text{m}^3$ PM10, not to be exceeded more than 35 times a calendar year	50 % on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005	1 January 2005
2. Annual limit value for the protection of human health	Calendar year	40 $\mu\text{g}/\text{m}^3$ PM10	20 % on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005	1 January 2005

STAGE 2¹

1. 24-hour limit value for the protection of human health	24 hours	50 $\mu\text{g}/\text{m}^3$ PM10, not to be exceeded more than 7 times a calendar year	To be derived from data and to be equivalent to the Stage 1 limit value	1 January 2010
2. Annual limit value for the protection of	Calendar year	20 $\mu\text{g}/\text{m}^3$ PM10	50 % on 1 January 2005 reducing on 1	1 January 2010

¹ Indicative limit values to be reviewed in the light of further information on health and environmental effects, technical feasibility and experience in the application of Stage 1 limit values.

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human health			January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2010	
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ANNEX IV

LIMIT VALUE FOR LEAD

	Averaging period	Limit value	Margin of tolerance	Date by which limit value is to be met
1. Annual limit value for the protection of human health	Calendar year	0,5 $\mu\text{g}/\text{m}^3$ ²	100 % on the entry into force of these regulations, reducing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0% by 1 January 2005 or by 1 January 2010 in the immediate vicinity of specific point sources, of which the Commission shall be notified	1 January 2005, or 1 January 2010 in the immediate vicinity of specific industrial sources situated on sites contaminated by decades of industrial activities. The Commission shall be notified of those sources by 19 July 2001. ³ In such cases, the limit value as from 1 January 2005 shall be 1,0 $\mu\text{g}/\text{m}^3$.

² The process laid down in Article 10 for the review of these regulations shall include consideration of the possibility of supplementing or replacing the limit value by a deposition limit value in the immediate vicinity of point sources

³ Such notification shall be accompanied by appropriate justification. The area in which higher limit values apply shall not extend further than 1.000 m from such specific sources.

ANNEX V

**DETERMINATION OF REQUIREMENTS FOR ASSESSMENT OF
CONCENTRATIONS OF SULPHUR DIOXIDE, NITROGEN DIOXIDE
(NO₂), AND OXIDES OF NITROGEN (NO_x), PARTICULATE MATTER
(PM₁₀) AND LEAD IN AMBIENT AIR WITHIN A ZONE OR
AGGLOMERATION**

1 Upper and lower assessment thresholds

The following upper and lower assessment thresholds will apply:

(a) SULPHUR DIOXIDE

	Health protection	Ecosystem protection
Upper assessment threshold	60 % of 24-hour limit value (75 µg/m ³ , not to be exceeded more than 3 times in any calendar year)	60 % of winter limit value (12 µg/m ³)
	40 % of 24-hour limit value (50 µg/m ³ , not to be exceeded more than 3 times in any calendar year)	40 % of winter limit value (8 µg/m ³)

(b) NITROGEN DIOXIDE AND OXIDES OF NITROGEN

	Hourly limit value for the protection of human health (NO ₂)	Annual limit value for the protection of human health (NO ₂)	Annual limit value for the protection of vegetation (NO _x)
Upper assessment threshold	70 % of limit value (140 µg/m ³ , not to be exceeded more than 18 times in any calendar year)	80 % of limit value (32 µg/m ³)	80 % of limit value (24 µg/m ³)
Lower assessment threshold	50 % of limit value (100 µg/m ³ , not to be exceeded more than 18 times in any calendar year)	65 % of limit value (26 µg/m ³)	65 % of limit value (18,5 µg/m ³)

(c) PARTICULATE MATTER

The upper and lower assessment thresholds for PM₁₀ are based on the indicative limit values for 1 January 2010.

	24-hour average	Annual average
Upper assessment threshold	60 % of limit value ($30\mu\text{g}/\text{m}^3$, not to be exceeded more than seven times in any calendar year)	70 % of limit value ($14\mu\text{g}/\text{m}^3$)
	40 % of limit value ($20\mu\text{g}/\text{m}^3$, not to be exceeded more than seven times in any calendar year)	50 % of limit value ($10\mu\text{g}/\text{m}^3$)

(d) LEAD

	Annual average
Upper assessment threshold	70 % of limit value ($0,35\mu\text{g}/\text{m}^3$)
Lower assessment threshold	50 % of limit value ($0,25\mu\text{g}/\text{m}^3$)

II. Determination of exceedances of upper and lower assessment thresholds

Exceedances of upper and lower assessment thresholds shall be determined on the basis of concentrations during the previous five years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if during those five years the total number of exceedances of the numerical concentration of the threshold is more than three times the number of exceedances allowed each year

Where fewer than five years' data are available the competent authority may combine measurement campaigns of short duration during the period of the year and at locations likely to be typical of the highest pollution levels with results obtained from information from emission inventories and modelling to determine exceedances of the upper and lower assessment thresholds.

ANNEX VI

LOCATION OF SAMPLING POINTS FOR THE MEASUREMENT OF SULPHUR DIOXIDE, NITROGEN DIOXIDE AND OXIDES OF NITROGEN, PARTICULATE MATTER AND LEAD IN AMBIENT AIR

The following considerations shall apply to fixed measurement.

I. Macroscale siting

(a) Protection of human health

Sampling points directed at the protection of human health shall be sited:

- (i) to provide data on the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s);
- (ii) to provide data on levels in other areas within the zones and agglomerations which are representative of the exposure of the general population.

Sampling points shall in general be sited to avoid measuring very small micro-environments in their immediate vicinity. As a guideline, a sampling point shall be sited to be representative of air quality in a surrounding area of no less than 200 m² at traffic-orientated sites and of several square kilometres at urban-background sites.

Sampling points shall also, where possible, be representative of similar locations not in their immediate vicinity.

Account shall be taken of the need to locate sampling points on islands, where that is necessary for the protection of human health.

(b) Protection of ecosystems and vegetation.

Sampling points targeted at the protection of ecosystems or vegetation shall be sited more than 20 km from agglomerations or more than 5 km from other built-up areas, industrial installations or motorways. As a guideline, a sampling point should be sited to be representative of air quality in a surrounding area of at least 1000 km². The competent authority may provide for a sampling point to be sited at a lesser distance or to be representative of air quality in a less extended area, taking account of geographical conditions.

Account shall be taken of the need to assess air quality on islands.

II. Microscale siting

The following guidelines shall be met as far as practicable:

- the flow around the inlet sampling probe shall be unrestricted without any obstructions affecting the airflow in the vicinity of the sampler (normally some metres away from buildings, balconies, trees, and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line);
- in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher positions (up to 8 m) may be necessary in some circumstances. Higher siting may also be appropriate if the station is representative of a large area;
- the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air;
- the sampler's exhaust outlet shall be positioned so that re-circulation of exhaust air to the sampler inlet is avoided;
- location of traffic-orientated samplers:
 - for all pollutants, such sampling points shall be at least 25 m from the edge of major junctions and at least 4 m from the centre of the nearest traffic lane,
 - for nitrogen dioxide, inlets shall be no more than 5 m from the kerbside,
 - for particulate matter and lead, inlets shall be sited so as to be representative of air quality near to the building line.

The following factors may also be taken into account:

- interfering sources;
- security;
- access;
- availability of electrical power and telephone communications;
- visibility of the site in relation to its surroundings;
- safety of public and operators;
- the desirability of co-locating sampling points for different pollutants;
- planning requirements.

III. Documentation and review of site selection

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The site-selection procedures shall be fully documented at the classification stage by such means as compass-point photographs of the surrounding area and a detailed map. Sites shall be reviewed at regular intervals with repeated documentation to ensure that selection criteria remain valid over time.

ANNEX VII

**CRITERIA FOR DETERMINING MINIMUM NUMBERS OF SAMPLING
POINTS FOR FIXED MEASUREMENT OF CONCENTRATIONS OF
SULPHUR DIOXIDE (SO₂), NITROGEN DIOXIDE (NO₂) AND OXIDES OF
NITROGEN, PARTICULATE MATTER AND LEAD IN AMBIENT AIR**

I. Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health and alert thresholds in zones and agglomerations where fixed measurement is the sole source of information

(a) Diffuse sources

Population of agglomeration or zone (thousands)	If concentrations exceed the upper assessment threshold	If maximum concentrations are between the upper and lower assessment thresholds	For SO ₂ and NO ₂ , in agglomerations where maximum concentrations are below the lower assessment threshold
0-250	1	1	Not applicable
250-499	2	1	1
500-749	2	1	1
750-999	3	1	1
1 001- 1 499	4	2	1
1 500-1 999	5	2	1
2 000-2 749	6	3	2
2 750-3 749	7	3	2
3 750-4 749	8	4	2
4 750-5 999	9	4	2
> 6 000	10	5	3
	For NO ₂ and particulate matter: to include at least one urban-background station and one traffic-oriented station		

(b) Point sources

For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement shall be calculated taking into account emission densities, the likely distribution patterns of ambient-air pollution and the potential exposure of the population.

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II. Minimum number of sampling points for fixed measurements to assess compliance with limit values for the protection of ecosystems or vegetation in zones other than agglomerations

If maximum concentrations exceed the upper assessment threshold	If maximum concentrations are between the upper and lower assessment thresholds
1 station every 20 000 km ²	1 station every 40 000 km ²

In island zones the number of sampling points for fixed measurement shall be calculated taking into account the likely distribution patterns of ambient-air pollution and the potential exposure of ecosystems or vegetation.

ANNEX VIII

DATA-QUALITY OBJECTIVES AND COMPILATION OF RESULTS OF AIR-QUALITY ASSESSMENT

I. Data-quality objectives

The following data-quality objectives for the required accuracy of assessment methods, of minimum time coverage and of data capture of measurement are laid down to guide quality-assurance programmes.

	Sulphur dioxide, nitrogen dioxide and oxides of nitrogen	Particulate matter and lead
Continuous measurement		
Accuracy	15 %	25%
Minimum data capture	90%	90%
Indicative measurement		
Accuracy	25 %	50 %
Minimum data capture	90 %	90%
Minimum time coverage	14 % (One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year)	14 % (One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year)
Modelling		
Accuracy:		
Hourly averages	50 %- 60 %	Not defined at present ⁴
Daily averages	50 %	
Annual averages	30 %	
Objective estimation		
Accuracy:	75 %	100 %

The accuracy of the measurement is defined as laid down in the "Guide to the Expression of Uncertainty of Measurements" (ISO 1993) or in ISO 5725-1 "Accuracy (trueness and precision) of measurement methods and results" (1994). The percentages in the table are given for individual measurements averaged, over the period considered, by the limit value, for a 95 % confidence interval (bias + two times the standard deviation). The accuracy for continuous measurements shall be interpreted as being applicable in the region of the appropriate limit value.

The accuracy for modelling and objective estimation is defined as the maximum

⁴ Any amendment necessary to adapt this point to scientific and technical progress shall be adopted in accordance with the procedure laid down in sub-regulation (2) of regulation 12 of the Ambient Air Quality Assessment and Management Regulations, 2000.

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deviation of the measured and calculated concentration levels, over the period considered by the limit value, without taking into account the timing of the events.

The requirements for minimum data capture and time coverage do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

By way of derogation, the competent authority may apply random measurements instead of continuous measurements for particulate matter and lead if it can demonstrate to the Commission that accuracy within the 95 % confidence interval with respect to continuous monitoring is within 10 %. Random sampling shall be spread evenly over the year.

II. Results of air quality assessment

The following information shall be compiled for zones or agglomerations within which sources other than measurement are employed to supplement information from measurement or as the sole means of air-quality assessment:

- a description of assessment activities carried out;
- the specific methods used, with references to descriptions of the method;
- the sources of data and information;
- a description of results, including accuracies and, in particular, the extent of any area or, if relevant, the length of road within the zone or agglomeration over which concentrations exceed limit value(s) or, as may be, limit value(s) plus applicable margin(s) of tolerance and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold;
- for limit values the object of which is the protection of human health, the population potentially exposed to concentrations in excess of the limit value.

Where possible, the competent authority shall compile maps showing concentration distributions within each zone and agglomeration.

III. Standardisation

For sulphur dioxide and oxides of nitrogen the volume shall be standardised at a temperature of 293 °K and a pressure of 101,3 kPa.

ANNEX IX**REFERENCE METHODS FOR ASSESSMENT OF CONCENTRATIONS OF
SULPHUR DIOXIDE, NITROGEN DIOXIDE AND OXIDES OF NITROGEN,
PARTICULATE MATTER (PM10 AND PM2,5) AND LEAD****I. Reference method for the analysis of sulphur dioxide:**

ISO/FDIS 10498 (Standard in draft) Ambient air - determination of sulphur dioxide - ultraviolet fluorescence method.

The competent authority may use any other method which it can demonstrate gives results equivalent to the above method

II. Reference method for the analysis of nitrogen dioxide and oxides of nitrogen:

ISO 7996: 1985 Ambient air - determination of the mass concentrations of nitrogen oxides - chemiluminescence method.

The competent authority may use any other method which it can demonstrate gives results equivalent to the above method.

III.A Reference method for the sampling of lead:

The reference method for the sampling of lead will be that described in the Annex to the Limit Value for Lead in the Air Regulations, 2000 until such time as the limit value in Annex IV to these regulations is to be met, when the reference method will be that for PM10 as laid down in Section IV of this Annex. The competent authority may use any other method which it can demonstrate gives results equivalent to the above method.

III.B Reference method for the analysis of lead:

ISO 9855 1993 Ambient air - Determination of the particulate lead content of aerosols collected in filters. Atomic absorption spectroscopy method.

The competent authority may use any other method which it can demonstrate gives results equivalent to the above method.

IV. Reference method for the sampling and measurement of PM10

The reference method for the sampling and measurement of PM10 shall be that described in EN 12341 "Air Quality - Field Test Procedure to Demonstrate Reference Equivalence of Sampling Methods for the PM10 fraction of particulate matter". The measurement principle is based on the collection on a filter of the PM10 fraction of ambient particulate matter and the gravimetric mass determination.

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The competent authority may use any other method which it can demonstrate gives results equivalent to the above method or any other method which the competent authority can demonstrate displays a consistent relationship to the reference method. In that event the results achieved by that method shall be corrected by a relevant factor to produce results equivalent to those that would have been achieved by using the reference method.

The competent authority shall inform the Commission of the method used to sample and measure PM₁₀. The Commission shall as soon as possible carry out intercomparison exercises for PM₁₀ sampling and measurement methods in order to provide information for the review of these regulations in accordance with regulation 10.

V. Provisional reference method for the sampling and measurement of PM_{2,5}

The Commission shall produce guidelines, in consultation with the committee referred to in regulation 12 of the Ambient Air Quality Assessment and Management Regulations, 2000, for an appropriate provisional reference method for the sampling and assessment of PM_{2,5} by 19 July 2001.

The competent authority may use any other method which it considers suitable.

The competent authority shall inform the Commission of the method used to sample and measure PM_{2,5}. The Commission shall as soon as possible carry out intercomparison exercises for PM_{2,5} sampling and measurement methods in order to provide information for the review of these regulations in accordance with regulation 10.

VI. Reference modelling techniques:

Reference modelling techniques cannot be specified at present. Any amendments to adapt this point to scientific and technical progress must be adopted in accordance with the procedure laid down in sub-regulation (2) of regulation 12 of the Ambient Air Quality Assessment and Management Regulations, 2000.