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SCOTTISH STATUTORY INSTRUMENTS

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**2007 No. 182**

**ENVIRONMENTAL PROTECTION**

**The Air Quality Standards (Scotland) Regulations 2007**

<i>Made</i>	- - - -	<i>6th March 2007</i>
<i>Laid before the Scottish Parliament</i>	- - - -	<i>7th March 2007</i>
<i>Coming into force</i>	- -	<i>29th March 2007</i>

The Scottish Ministers, in exercise of the powers conferred by section 2(2) of the European Communities Act 1972<sup>(1)</sup> and of all other powers enabling them in that behalf, hereby make the following Regulations:

**PART 1**

**General**

**Citation, commencement and extent**

1.—(1) These Regulations may be cited as the Air Quality Standards (Scotland) Regulations 2007 and shall come into force on 29th March 2007.

(2) These Regulations extend to Scotland only.

**Definitions**

2.—(1) In these Regulations—

“action plan” means an action plan required by regulation 11;

“additional polycyclic aromatic hydrocarbons” means those organic compounds, other than benzo(a)pyrene and basic polycyclic aromatic hydrocarbons, which are composed of at least two fused aromatic rings made entirely from carbon and hydrogen;

“agglomeration” has the meaning given in regulation 5(2);

“air quality standards” means limit values, target values, and long-term objectives;

“alert threshold” means an alert threshold set out in Schedule 3;

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(1) 1972 c. 68. Section 2(2) was amended by the Scotland Act 1998 (c. 46), Schedule 8 paragraph 15(3). The function of the Minister of the Crown exercisable under section 2(2) was, in so far as exercisable within devolved competence, transferred to the Scottish Ministers by section 53 of the Scotland Act 1998.

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

“assessment” (unless the context indicates otherwise) means any method used to measure, monitor, calculate, predict or estimate the concentration of a pollutant;

“attainment date” means the date (or in the case of ozone, year) specified for the relevant air quality standard in Schedule 1;

“basic polycyclic aromatic hydrocarbons” means—

- (a) benzo(a)anthracene;
- (b) benzo(b)fluoranthene;
- (c) benzo(j)fluoranthene;
- (d) benzo(k)fluoranthene;
- (e) dibenz(a,h)anthracene; and
- (f) indeno (1,2,3 cd)pyrene;

“combined measurement” means an assessment of a Group A or Group B pollutant by means of a combination of fixed measurement and modelling techniques;

“concentration” means—

- (a) for pollutants other than Group B pollutants, the concentration of the relevant pollutant in ambient air; or
- (b) for Group B pollutants, the total content of the relevant pollutant in the PM<sub>10</sub> fraction in ambient air,

and, in both cases, a reference to a concentration is to a concentration assessed by the Scottish Ministers in accordance with these Regulations;

“fixed measurement” means measurement in accordance with regulation 14(1) for a Group A or Group B pollutant or regulation 14(3) for ozone;

“Group A pollutants” means benzene, carbon monoxide, lead, nitrogen dioxide and oxides of nitrogen, PM<sub>10</sub> and sulphur dioxide;

“Group B pollutants” means arsenic, benzo(a)pyrene, cadmium and nickel and their compounds;

“improvement plan” means an improvement plan required by regulation 8;

“information threshold” means the information threshold set out in Part 2 of Schedule 3;

“limit value” means a maximum permitted concentration of a Group A pollutant set out in Part 1 of Schedule 1;

“long term objective” means a maximum concentration of ozone set out in Part 4 of Schedule 1 which is to be achieved in the long term;

“lower assessment threshold” means the lower assessment threshold specified for the relevant pollutant in Parts 1 and 2 of Schedule 4;

“margin of tolerance” means an amount specified in Part 2 of Schedule 1 by which a limit value may be exceeded;

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

“ozone precursor substances” means substances which contribute to the formation of ground level ozone;

“PM<sub>2.5</sub>” means particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at 2.5µm aerodynamic diameter;

“PM<sub>10</sub>” means particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at 10µm aerodynamic diameter, in relation to which, in the case of assessments of Group B pollutants, the inlet shall be as defined in CEN standard EN 12341 1998(2);

“pollutant” means—

- (a) any Group A pollutant;
- (b) any Group B pollutant;
- (c) ozone; or
- (d) except in Part 2 of these Regulations, any pollutant to which Part 3 of these Regulations applies;

“polycyclic aromatic hydrocarbons” mean—

- (a) the basic polycyclic aromatic hydrocarbons; and
- (b) any of the additional polycyclic aromatic hydrocarbons which the Scottish Ministers decide should be monitored for the purpose of regulation 19(1);

“rural background station” means a station referred to in the fourth row (rural background) of the table in Part 3 of Schedule 6;

“target value” means a maximum concentration of a Group B pollutant set out in Part 3 of Schedule 1 or of ozone set out in Part 4 of Schedule 1;

“upper assessment threshold” means the upper assessment threshold specified for the relevant pollutant in Parts 1 and 2 of Schedule 4; and

“zone” means one of the parts of the territory of Scotland into which the Scottish Ministers has divided Scotland under regulation 5(1) for the purposes of Part 2 of these Regulations and references to a zone shall (unless the context indicates otherwise), include an agglomeration.

(2) Subject to paragraph 1 words and expressions used both in these Regulations and in the following Directives shall have the same meaning in these Regulations as in the relevant Directive—

- (a) Council Directive 96/62/EC on ambient air quality assessment and management(3);
- (b) Council Directive 1999/30/EC relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air(4);
- (c) Directive 2000/69/EC of the European Parliament and of the Council relating to limit values for benzene and carbon monoxide in ambient air(5);
- (d) Directive 2002/3/EC of the European Parliament and of the Council relating to ozone in ambient air(6); and
- (e) Directive 2004/107/EC of the European Parliament and of the Council relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air(7).

### Designation of competent authority

3. The Scottish Ministers are designated as the competent authority for the purposes of Article 3 (implementation and responsibilities) of Council Directive 96/62/EC on ambient air quality assessment and management.

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(2) This standard is issued by the European Committee for Standardisation (CEN); (copies may be obtained from CEN at 36, Rue de Stassart B-1050, Brussels, Belgium, <http://www.cenorm.be>).

(3) O.J. No L 296, 21.11.96, p.55.

(4) O.J. No L 163, 29.06.99, p.41.

(5) O.J. No L 313, 13.12.00, p.12.

(6) O.J. No L 67, 09.03.02, p.14.

(7) O.J. No L 23, 26.01.05, p.3.

## PART 2

### Group A and Group B pollutants and ozone

#### CHAPTER 1

##### Air Quality Standards

###### **Preliminary and application**

- 4.—(1) This Part applies in respect of the following pollutants:—
- (a) Group A pollutants;
  - (b) Group B pollutants; and
  - (c) ozone.
- (2) The Scottish Ministers shall ensure that all measures taken under Chapters 2 or 3 of this Part—
- (a) take into account an integrated approach to the protection of air, water and soil; and
  - (b) have no significant negative effect on the environment in—
    - (i) any other member State; or
    - (ii) any other part of the United Kingdom.

###### **Zones and agglomerations**

- 5.—(1) The Scottish Ministers shall, for the purposes of this Part, divide the territory of Scotland into zones.
- (2) A zone shall be classified as an agglomeration for the purposes of this Part where—
- (a) it has a population in excess of 250,000 inhabitants; or
  - (b) in any other case, the Scottish Ministers determine that its population density per km<sup>2</sup> is sufficiently high to justify such a classification.
- (3) The Scottish Ministers may establish different zones for different pollutants where they consider this appropriate.

###### **Air quality standards**

- 6.—(1) Schedule 1 prescribes the following air quality standards—
- (a) for Group A pollutants, the limit values set out in Part 1 of that Schedule;
  - (b) for Group B pollutants, the target values set out in Part 3 of that Schedule; and
  - (c) for ozone, the target values and long-term objectives set out in Part 4 of that Schedule.
- (2) Limit values—
- (a) shall be attained by the attainment date specified for the limit value concerned; or
  - (b) apply when these Regulations come into force if no attainment date is specified.
- (3) Target values shall be attained from the attainment date specified, in so far as this is possible through measures required by regulation 7.
- (4) In the case of benzene and nitrogen dioxide, the margins of tolerance set out in Part 2 of Schedule 1 apply within the periods specified.

## CHAPTER 2

### Attainment of air quality standards

#### General attainment measures

7.—(1) The Scottish Ministers shall take the necessary measures to ensure that the air quality standards set out in regulation 6 are attained.

(2) In the case of Group B pollutants, the necessary measures are—

- (a) measures not entailing disproportionate costs; and
- (b) in so far as concentrations of a relevant pollutant arise as a result of emissions from installations to which Council Directive 96/61/EC concerning integrated pollution prevention and control<sup>(8)</sup> applies, the application of best available techniques to prevent pollution from those installations in accordance with that Directive<sup>(9)</sup>.

(3) In the case of ozone, the necessary measures are measures the Scottish Ministers consider to be proportionate and, in relation to the long term objectives, cost effective.

#### Improvement plans

8.—(1) This regulation applies in respect of each zone in which prior to the attainment date—

- (a) concentrations of benzene or nitrogen dioxide exceed a limit value plus the applicable margin of tolerance; or
- (b) concentrations of ozone exceed a target value.

(2) Where paragraph (1)(a) applies, the Scottish Ministers shall prepare and implement an improvement plan for the pollutant in question or, where concentrations of both pollutants exceed the level referred to, a single improvement plan for both pollutants.

(3) Where paragraph (1)(b) applies, the Scottish Ministers shall prepare and implement an improvement plan in respect of ozone unless they consider that the target value would not be attainable through proportionate measures.

(4) An improvement plan shall include the information specified in Schedule 2.

(5) Where the Scottish Ministers are required to prepare and implement an improvement plan under both paragraphs (2) and (3), they shall, where they consider it appropriate, prepare and implement an integrated improvement plan covering all of the pollutants concerned.

(6) An improvement plan may comprise either a plan or a programme which, in either case, shall have the objective of attaining—

- (a) the limit value, by the attainment date; or
- (b) the target value, by 2010.

#### Other improvement measures

9.—(1) This regulation applies in respect of each zone in which—

- (a) concentrations of one or more Group B pollutants exceeds the relevant target value; or
- (b) concentrations of ozone are equal to or below the target values, but exceed a long-term objective.

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<sup>(8)</sup> O.J. No L 257, 10.10.96, p.26.

<sup>(9)</sup> The Directive is implemented by the Pollution Prevention and Control (Scotland) Regulations 2000 (S.S.I. 2000/323 as amended by the Antisocial Behaviour etc. (Scotland) Act 2004 (asp 8), Schedule 2 paragraph 7, S.S.I. 2002/493, S.S.I. 2003/146, 170, 221 and 235, S.S.I. 2004/26, 110, 112 and 512, S.S.I. 2005/101, 340 and 510).

- (2) Where paragraph (1)(a) applies, the Scottish Ministers shall—
- (a) identify the cause of the pollution and the predominant sources of emissions; and
  - (b) in relation to the pollutants concerned, ensure that the measures required by regulation 7(2) are directed in particular at the sources of emissions identified.
- (3) Where paragraph (1)(b) applies, the Scottish Ministers shall prepare and implement measures which they consider to be cost-effective with the aim of attaining the long-term objective.
- (4) The Scottish Ministers shall ensure that the measures required in paragraph (3) are consistent with the improvement plans prepared for ozone under regulation 8(3).

### CHAPTER 3

#### Maintenance of air quality standards and action plans

##### **Maintenance of air quality standards**

- 10.**—(1) This regulation applies in respect of each zone in which—
- (a) concentrations of one or more Group A pollutants are below the relevant limit values;
  - (b) concentrations of one or more Group B pollutants are below the relevant target values; or
  - (c) concentrations of ozone meet the long-term objectives.
- (2) Where sub-paragraphs (a) or (b) of paragraph (1) apply, the Scottish Ministers shall, in respect of each pollutant meeting the conditions set out in those sub paragraphs—
- (a) maintain compliance with the relevant limit values or target values; and
  - (b) endeavour to maintain the lowest concentration which they consider to be compatible with sustainable development.
- (3) Where paragraph (1)(c) applies, the Scottish Ministers shall—
- (a) in so far as the transboundary nature of ozone pollution, meteorological conditions and any other similar factors permit, ensure that concentrations are kept at or below the long-term objectives; and
  - (b) maintain through proportionate measures the lowest concentrations of ozone which they consider to be compatible with sustainable development and a high level of protection for the environment and human health.

##### **Action plans**

- 11.**—(1) The Scottish Ministers shall—
- (a) in accordance with paragraphs (2) to (4) and (6), prepare; and
  - (b) in accordance with paragraph (5) and (6), implement,
- action plans.
- (2) The action plans shall indicate the measures to be taken within any zone in the short term in order to achieve the objectives set out in paragraph (3) in the event of circumstances in which the Scottish Ministers consider there is a risk that any one of the following will be exceeded:—
- (a) a limit value;
  - (b) the alert threshold for nitrogen dioxide or sulphur dioxide; or
  - (c) subject to paragraph (4), the alert threshold for ozone.
- (3) The objectives of each action plan shall be—
- (a) to reduce the risk that the relevant limit value or alert threshold will be exceeded; or

(b) where it is not possible to prevent the relevant limit value or alert threshold being exceeded, to limit the duration or severity of the occurrence.

(4) In relation to ozone, the obligation imposed by paragraph (1)(a) shall only apply in so far as, taking into account geographical, meteorological and economic conditions, the Scottish Ministers consider there is significant potential for the objectives set out in paragraph (3) to be achieved.

(5) When the Scottish Ministers consider that the risks referred to in paragraph (2) arise within a zone, they shall implement the measures indicated in the relevant action plans within that zone to the extent they consider necessary in the circumstances.

(6) In preparing and implementing any action plans for ozone, the Scottish Ministers shall have regard to Annexes I and II to Commission Decision [2004/279/EC](#) concerning guidance for implementation of Directive [2002/3/EC](#)(10).

(7) Schedule 3 has effect in prescribing—

- (a) alert thresholds for nitrogen dioxide and sulphur dioxide, in Part 1 of that Schedule; and
- (b) the alert threshold and information threshold for ozone, in Part 2 of that Schedule.

## CHAPTER 4

### Assessment

#### **Duty to assess air quality**

**12.** The Scottish Ministers shall assess the concentration of each pollutant within each zone in accordance with regulations 13 to 16.

#### **Assessment methods**

**13.—**(1) Subject to paragraph (2), the Scottish Ministers shall assess concentrations of a Group A pollutant by fixed measurement where—

- (a) the assessment takes place within an agglomeration; or
- (b) in any other zone, representative concentrations of that pollutant exceed the relevant upper assessment threshold.

(2) Where the zone concerned is the same as that established under the Air Quality Limit Values (Scotland) Regulations 2003(11) (“the 2003 Regulations”), the Scottish Ministers may continue to use the method by which concentrations of a Group A pollutant were assessed within that zone under the 2003 Regulations (“the 2003 method”).

(3) Except where fixed measurement is required by paragraph (1) or they continue to use the 2003 method in accordance with paragraph (2), and, in the case of nitrogen dioxide, subject to the requirements imposed by regulation 15(7), the Scottish Ministers may assess concentrations of a Group A pollutant by any one of the following methods—

- (a) fixed measurement;
- (b) combined measurement; or
- (c) the sole use of modelling or objective estimation techniques, provided that representative concentrations of the pollutant in the zone concerned are below the relevant lower assessment threshold.

(4) The Scottish Ministers shall assess concentrations of a Group B pollutant by fixed measurement in any zone in which representative concentrations of that pollutant exceed the relevant upper assessment threshold.

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(10) O.J. No. L 87, 25.03.04, p.50.

(11) S.S.I. 2003/428 amended by S.S.I. 2003/547 and S.S.I. 2005/300.

(5) Except where fixed measurement is required by paragraph (4), the Scottish Ministers may assess concentrations of a Group B pollutant by one of the following methods:–

- (a) fixed measurement;
- (b) combined measurement; or
- (c) the sole use of modelling or objective estimation techniques, provided that representative concentrations of the pollutant in the zone concerned are below the relevant lower assessment threshold.

(6) For the purposes of paragraphs (1) and (3) to (5), the Scottish Ministers shall determine the representative concentrations in accordance with Part 3 of Schedule 4.

(7) The Scottish Ministers shall review the method by which concentrations of a Group A or Group B pollutant are assessed at least once every five years or earlier if there are significant changes in activities affecting concentrations of the relevant pollutant within the zone concerned.

(8) Where the Scottish Ministers continue to use the 2003 method, the date from which the period of review commences is the later of–

- (a) the date the zone was classified under regulation 7(1) of the 2003 Regulations; or
- (b) the date on which that classification was last reviewed under regulation 8 of those Regulations.

(9) The Scottish Ministers shall assess concentrations of ozone by fixed measurement if, within the zone concerned, concentrations have exceeded a long-term objective during any of the previous five years of measurement.

(10) In cases where fewer than five years' information on concentrations is available, the Scottish Ministers may assess concentrations of ozone by combining the following:–

- (a) measurement campaigns of short duration at times and locations which they consider are likely to be typical of the highest pollution levels; and
- (b) results from emission inventories and modelling.

#### **Fixed and combined measurement**

**14.**—(1) Where the Scottish Ministers assess concentrations of a Group A or Group B pollutant by fixed measurement, whether alone or as part of combined measurement, they shall ensure that–

- (a) measurements of the relevant pollutant are taken at sampling points either continuously or by random sampling, subject, in the case of nitrogen dioxide, to the requirements imposed by regulation 15(7); and
- (b) the number of measurements is sufficiently large to enable concentrations of that pollutant to be properly determined.

(2) Where the Scottish Ministers assess concentrations of a Group A or Group B pollutant by fixed measurement, they may supplement information from sampling points for fixed measurement with information from modelling techniques in so far as they consider this will provide an adequate level of information on ambient air quality.

(3) Where the Scottish Ministers assess concentrations of ozone by fixed measurement–

- (a) they shall ensure that–
  - (i) the measurements are taken at fixed sites continuously; and
  - (ii) the number of measurements is sufficiently large to enable concentrations to be properly determined;

and



- (b) they may supplement information from sampling points with information from modelling techniques or indicative measurements.

### **Sampling points**

**15.**—(1) Where the Scottish Ministers assess concentrations of a Group A or Group B pollutant by fixed measurement they shall, except in cases falling within paragraph (2)(a), install the number of sampling points required for the zone in accordance with the relevant Part of Schedule 5.

(2) Where the Scottish Ministers assess concentrations of a Group A or Group B pollutant by—

- (a) fixed measurement, in cases where they obtain information from modelling techniques under regulation 14(2); or
- (b) combined measurement,

they shall install the number of sampling points they determine is sufficient, taken together with the spatial resolution of the other techniques employed, for concentrations of the relevant pollutant to be established within the zone concerned.

(3) The Scottish Ministers shall locate all sampling points for Group A and Group B pollutants in accordance with the requirements set out in the relevant Parts of Schedule 6.

(4) Where the Scottish Ministers assess concentrations of ozone by fixed measurement they shall, except where paragraphs (5) or (6) apply, install the number of sampling points required for the zone in accordance with Part 4 of Schedule 5.

(5) In the case of zones where—

- (a) five years of measurement have been carried out; and
- (b) during each of those years, concentrations of ozone have been below the long-term objectives,

the Scottish Ministers may determine the number of sampling points in accordance with Part 5 of Schedule 5.

(6) In the case of zones in which the Scottish Ministers supplement the information obtained from sampling points for fixed measurement with information from modelling techniques or indicative measurement in accordance with regulation 14(3)(b), they may reduce the number of sampling points for ozone provided that—

- (a) they consider that the modelling techniques adopted provide an adequate level of information for the assessment of air quality with regard to—
  - (i) the target values;
  - (ii) the information threshold; and
  - (iii) the alert threshold;
- (b) they consider that the number of sampling points to be installed and the spatial resolution of other techniques are sufficient for the concentration of ozone to be established and to enable the compilation of assessment results as specified in Part 3 of Schedule 7;
- (c) the number of sampling points in each zone amounts to—
  - (i) at least one sampling point per two million inhabitants; or
  - (ii) one sampling point per 50,000 km<sup>2</sup>,whichever produces the greater number of sampling points;
- (d) each zone contains at least one sampling point; and
- (e) concentrations of nitrogen dioxide are assessed at all remaining sampling points except rural background stations.

- (7) The Scottish Ministers shall ensure that—
- (a) except where paragraph (6)(e) applies, concentrations of nitrogen dioxide are assessed at at least half of the number of sampling points required to be installed for ozone in accordance with Part 4 of Schedule 5; and
  - (b) the measurement of nitrogen dioxide taken at any sampling point is continuous, except at rural background stations where other measurement methods may be used.
- (8) The Scottish Ministers shall locate all sampling points for ozone in accordance with the requirements set out in the relevant Parts of Schedule 6.

### **Other assessment requirements**

**16.**—(1) When the Scottish Ministers undertake assessments by methods other than fixed measurement, they shall comply with the requirements of the relevant Part of Schedule 7 when using those other methods.

(2) When conducting any assessment under this Chapter, the Scottish Ministers shall have regard to the relevant data quality objectives set out in Schedule 8.

(3) The Scottish Ministers shall undertake assessments in accordance with—

- (a) the relevant reference methods required by Schedule 9; or
- (b) any alternative reference methods, where—
  - (i) they consider that the method in question can be determined to give equivalent results to the relevant method required by Schedule 9; or
  - (ii) in the case of the sampling and measurement of PM<sub>10</sub> only, they consider that the method in question can be demonstrated to display a consistent relationship to the reference method required by Schedule 9.

(4) Measurements of volume of benzene, carbon monoxide, nitrogen dioxide, oxides of nitrogen, ozone and sulphur dioxide shall be standardised at a temperature of 293K and a pressure of 101.3 kPa.

## **PART 3**

### **Other pollutants and background monitoring**

#### **Measurement of PM<sub>2.5</sub>**

**17.**—(1) The Scottish Ministers shall install and operate measuring stations to supply representative data on concentrations of PM<sub>2.5</sub>.

(2) For the purpose of paragraph (1), the Scottish Ministers shall—

- (a) determine the number of measuring stations they consider necessary;
- (b) locate each measuring station—
  - (i) together with a sampling point established for PM<sub>10</sub>, where this is possible; or
  - (ii) in any other case, in accordance with the principles set out in Parts 1, 4 and 5 of Schedule 6 which are relevant to PM<sub>10</sub>;
- (c) use reference methods for sampling and measurement that they consider suitable; and
- (d) have regard to the data quality objectives set out in Part 1 of Schedule 8.

### **Measurement of ozone precursor substances**

**18.**—(1) The Scottish Ministers shall install and operate one or, if they consider it necessary, more measuring stations to supply data on concentrations of the ozone precursor substances set out in Schedule 10.

- (2) When complying with paragraph (1) the Scottish Ministers shall have regard—
- (a) generally to Annex III of the Decision referred to in regulation 11(6); and
  - (b) in choosing the number and sites of the measuring stations and in their operation, to Schedule 10.

### **Monitoring of polycyclic aromatic hydrocarbons**

**19.**—(1) The Scottish Ministers shall monitor concentrations of—

- (a) basic polycyclic aromatic hydrocarbons; and
- (b) any additional polycyclic aromatic hydrocarbons which they decide should be monitored, at monitoring sites designated by them for this purpose.

- (2) The Scottish Ministers shall locate each monitoring site—
- (a) together with a sampling point established for benzo(a)pyrene, where this is possible; or
  - (b) in any other case, in accordance with those Parts of Schedule 6 relevant to Group B pollutants.

(3) The total number of monitoring sites and their overall selection shall be such as the Scottish Ministers consider necessary to ensure that the monitoring provides sufficient information to identify long-term trends and geographical variation in the concentration of each polycyclic aromatic hydrocarbon.

(4) Regulation 16(2) and (3) shall apply to the monitoring required by this regulation as if such monitoring were an assessment under Chapter 4 of Part 2.

### **Background monitoring**

**20.**—(1) The Scottish Ministers shall install and operate background sampling points to provide the measurements required by paragraph (2).

- (2) The measurements required are indicative measurements of—
- (a) concentrations of—
    - (i) Group B pollutants;
    - (ii) basic polycyclic aromatic hydrocarbons; and
    - (iii) total gaseous mercury;and
  - (b) total deposition of—
    - (i) Group B pollutants, within the PM<sub>10</sub> fraction;
    - (ii) basic polycyclic aromatic hydrocarbons; and
    - (iii) mercury.
- (3) For the purposes of paragraphs (1) and (2), the Scottish Ministers shall ensure that—
- (a) at least one sampling point is installed for every 100,000 km<sup>2</sup>; and
  - (b) each sampling point is located in accordance those Parts of Schedule 6 relevant to Group B pollutants.

(4) Regulation 16(2) and (3) shall apply to the taking of measurements referred to in paragraph (2) as if the taking of these measurements were an assessment under Chapter 4 of Part 2.

(5) The Scottish Ministers may—

- (a) in addition to the indicative measurements referred to in paragraph (2), take further indicative measurements relating specifically to particulate and gaseous divalent mercury from the sampling points installed under paragraph (1); and
- (b) co ordinate any measurements taken under this regulation with the European Monitoring and Evaluation of Pollutants monitoring strategy and measurement programme<sup>(12)</sup>.

(6) For the purpose of paragraph (2)(a)(iii), “total gaseous mercury” means—

- (a) elemental mercury vapour (Hg<sup>0</sup>); and
- (b) reactive gaseous mercury.

## PART 4

### Public information and participation

#### General requirements

**21.**—(1) The Scottish Ministers shall—

- (a) ensure that up-to-date information is made available to the public in accordance with this Part; and
- (b) consult the public in accordance with regulation 28.

(2) The Scottish Ministers shall ensure that the information to which this Part relates is—

- (a) made available in a form that is clear, comprehensible and accessible;
- (b) disseminated or published by the most appropriate means, as they may determine, including (but not necessarily limited to) broadcast media, press, publications, information screens, the internet or other computer network sources; and
- (c) up-dated—
  - (i) in accordance with a minimum frequency specified in this Part; or
  - (ii) in other cases, as soon as practicable.

(3) For the purposes of this Part, “the public” includes natural or legal persons, health-care bodies and other organisations having an interest in ambient air quality or representing the interests of sensitive populations, consumers or the environment.

#### Information regarding zones

**22.** The Scottish Ministers shall make available—

- (a) information identifying each zone and specifying which zones have been classified as agglomerations;
- (b) lists of—
  - (i) zones which have attained all air quality standards; and
  - (ii) zones which have not attained one or more of the air quality standards, in which case the list shall specify the pollutants and air quality standards concerned;

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<sup>(12)</sup> The European co operative programme for Monitoring and Evaluation of the long-range transmission of air pollutants in Europe (<http://www.emep.int>).

- (c) until 31st December 2009, a list of zones in which concentrations of benzene or nitrogen dioxide either—
  - (i) exceed a limit value plus the relevant margin of tolerance; or
  - (ii) are between a limit value and the relevant margin of tolerance,specifying, in both cases, the pollutant and limit values for which this is the case; and
- (d) a list classifying each zone in relation to the method by which the Scottish Ministers assess concentrations of each Group A and Group B pollutant within that zone in accordance with regulation 13.

### **Information on concentrations**

- 23.**—(1) The Scottish Ministers shall make available information in respect of—
- (a) concentrations of Group A pollutants;
  - (b) concentrations of Group B pollutants;
  - (c) concentrations of ozone; and
  - (d) in so far as measured or monitored under Part 3 of these Regulations—
    - (i) concentrations of mercury, PM<sub>2.5</sub> and polycyclic aromatic hydrocarbons; and
    - (ii) deposition rates of Group B pollutants, mercury and basic polycyclic aromatic hydrocarbons.
- (2) The information referred to in paragraph (1)(a) shall be updated in the case of—
- (a) benzene, as an average value over the preceding twelve months—
    - (i) at least on a three monthly basis; and
    - (ii) where practicable, on a monthly basis;
  - (b) carbon monoxide, as a maximum running average over eight hours—
    - (i) at least on a daily basis; and
    - (ii) where practicable, on an hourly basis;
  - (c) lead, on a three monthly basis; and
  - (d) nitrogen dioxide, sulphur dioxide and PM<sub>10</sub>—
    - (i) at least on a daily basis; and
    - (ii) in the case of hourly values for nitrogen dioxide and sulphur dioxide, where practicable, on an hourly basis.
- (3) The information required to be made available by paragraph (1)(c) shall be updated—
- (a) at least on a daily basis; and
  - (b) where appropriate and practicable, on an hourly basis.
- (4) The information required to be made available by paragraph (1)(d)(i) in respect of PM<sub>2.5</sub> shall be updated at least on a daily basis.

### **Information on breach of alert or information threshold**

- 24.**—(1) The Scottish Ministers shall, as soon as possible in each case, make available—
- (a) the information set out in Part 1 of Schedule 11, when the alert threshold for nitrogen dioxide or sulphur dioxide is exceeded; and
  - (b) the information set out in Part 2 of Schedule 11—
    - (i) when the alert threshold or information threshold for ozone is exceeded; and

(ii) in so far as practicable, when either threshold is predicted to be exceeded.

(2) In cases where the Scottish Ministers make information available under both sub paragraphs (a) and (b) of paragraph (1) they shall combine the information in a comprehensive format.

(3) Without prejudice to the generality of the obligation imposed by this regulation in cases where the alert threshold for ozone is exceeded, or is predicted to be exceeded, the Scottish Ministers shall ensure that timely information is provided to health care bodies.

### **Information on breach of air quality standards**

**25.**—(1) The Scottish Ministers shall provide the information required by paragraphs (2) to (5) in respect of each of the pollutants to which those paragraphs relate.

(2) For Group A pollutants, the Scottish Ministers shall indicate the extent to which the following have been exceeded:—

- (a) any limit value, over the relevant averaging period set out in Part 1 of Schedule 1; or
- (b) the alert thresholds for nitrogen dioxide or sulphur dioxide,

and provide a short assessment of these occurrences and their effects on health.

(3) For Group B pollutants, the Scottish Ministers shall—

- (a) indicate any occasion during which any target value has been exceeded; and
- (b) in relation to each occurrence, provide at least the following information—
  - (i) the areas within each zone in which the target value was exceeded;
  - (ii) the reasons for the occurrence and the predominant sources of emissions identified in accordance with regulation 9(2)(a);
  - (iii) a short assessment of the effect of the occurrence on overall compliance with the target value in the zone concerned;
  - (iv) details of the measures being directed at any identified sources of emissions in accordance with regulation 9(2)(b); and
  - (v) the prospects for attainment of the target value in the zone affected.

(4) For ozone, the Scottish Ministers shall—

- (a) indicate any occasion during which concentrations have exceeded—
  - (i) the long-term objectives for the protection of human health;
  - (ii) the information threshold; or
  - (iii) the alert threshold; and
- (b) provide a short assessment of each occurrence, including its extent and its effects on health.

(5) The Scottish Ministers shall update the information referred to in paragraphs (2) and (4) in accordance with the timescales specified for the pollutants in question by regulation 23(2) and (3).

### **Ozone annual report**

**26.**—(1) The Scottish Ministers shall produce an annual report in relation to ozone containing the following information:—

- (a) for human health, an indication of all occasions during which—
  - (i) the target value;
  - (ii) long-term objective; or
  - (iii) alert threshold,

- has been exceeded;
  - (b) for vegetation, an indication of all occasions during which—
    - (i) the target value; or
    - (ii) long-term objective,has been exceeded; and
  - (c) in relation to both sub-paragraphs (a) and (b), a short assessment of the effects of each such occurrence.
- (2) The information referred to in paragraph (1) may include, where appropriate—
- (a) further information and assessments on forest protection, obtained and collated in accordance with Part 1 of Schedule 12; and
  - (b) information on ozone precursor substances.

### **Information on action and improvement plans**

27.—(1) The Scottish Ministers shall make available, and provide information on the implementation of, each action plan and improvement plan.

(2) Where regulation 11(4) applies, the Scottish Ministers shall make available the results of the investigations undertaken in the context of their considerations under that regulation, irrespective of whether they have prepared an action plan under regulation 11(1)(a).

### **Public participation in improvement plans**

28.—(1) The Scottish Ministers shall consult the public where they propose to prepare, modify or review an improvement plan.

- (2) Where paragraph (1) applies, the Scottish Ministers shall—
- (a) inform the public as to their proposal, any relevant background information and the right of the public to participate in the relevant decision making process;
  - (b) specify the means by which the public can participate in the consultation, including an address for responses, and a reasonable timescale for the consultation; and
  - (c) take account of the results of the consultation in making the relevant decision.

(3) Where, following a consultation, the Scottish Ministers take a decision in relation to their proposal, they shall inform the public and provide information as to the reasons and considerations on which their decision is based as well as information as to the public participation process.

## **PART 5**

### **Miscellaneous provisions**

#### **Collation of information etc**

29.—(1) The Scottish Ministers shall ensure that the information specified in Part 1 of Schedule 12 is obtained and collated.

(2) The criteria for aggregating data and calculating statistical parameters specified in Part 2 of Schedule 12 shall apply in the case of ozone.

## Revocations

- 30.**—(1) Subject to regulation 13(2), the following Regulations are revoked:—
- (a) the Air Quality Limit Values (Scotland) Regulations 2003(**13**);
  - (b) the Air Quality Limit Values (Scotland) Amendment Regulations 2003(**14**); and
  - (c) the Air Quality Limit Values (Scotland) Amendment Regulations 2005(**15**).
- (2) The following regulations are revoked with effect from, and including, 1st January 2010(**16**):—
- (a) regulation 6 of the Air Quality Standards Regulations 1989(**17**); and
  - (b) regulation 2(2) of the Air Quality Standards (Amendment) Regulations 1995(**18**).

St Andrew's House,  
Edinburgh  
6th March 2007

*SARAH H BOYACK*  
Authorised to sign by the Scottish Ministers

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(13) [S.S.I. 2003/428](#).

(14) [S.S.I. 2003/547](#).

(15) [S.S.I. 2005/300](#).

(16) Regulation 6 of [S.I.1989/317](#) has been revoked so far as it applies in Scotland by [S.S.I. 2003/428](#) (regulation 16) but with effect from 1st January 2010, so that this revocation will not have taken effect by the time [S.S.I. 2003/428](#) is itself revoked.

(17) [S.I. 1989/317](#), amended by [S.I. 1995/3146](#) in relation to regulation 6.

(18) [S.I. 1995/3146](#).



## SCHEDULE 1

Regulation 6

## Air quality standards

## PART 1

## Limit values for Group A pollutants

**Benzene**

	<i>Averaging period</i>	<i>Limit value</i>	<i>Attainment date</i>
Limit value for the protection of human health	Calendar year	5 µg/m <sup>3</sup>	1st January 2010

**Carbon monoxide**

For the purposes of this table, the maximum daily 8-hour mean concentration shall be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8 hour average so calculated shall be assigned to the day on which it ends, i.e. the first calculation period for any one day shall be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day shall be the period from 16:00 to 24:00 on that day.

	<i>Averaging period</i>	<i>Limit value</i>
Limit value for the protection of human health	Maximum daily 8-hour mean	10 mg/m <sup>3</sup>

**Lead**

	<i>Averaging period</i>	<i>Limit value</i>
Annual limit value for the protection of human health	Calendar year	0.5 µg/m <sup>3</sup>

**Nitrogen dioxide (NO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>)**

	<i>Averaging period</i>	<i>Limit value</i>	<i>Attainment date</i>
Hourly limit value for the protection of human health	1 hour	200 µg/m <sup>3</sup> NO <sub>2</sub> , not to be exceeded more than 18 times a calendar year	1st January 2010
Annual limit value for the protection of human health	Calendar year	40 µg/m <sup>3</sup> NO <sub>2</sub>	1st January 2010
Annual limit value for the protection of vegetation	Calendar year	30 µg/m <sup>3</sup> NO <sub>x</sub>	

*Status: This is the original version (as it was originally made).*

## PM<sub>10</sub>

	<i>Averaging period</i>	<i>Limit value</i>
24-hour limit value for the protection of human health	24 hours	50 µg/m <sup>3</sup> PM <sub>10</sub> , not to be exceeded more than 35 times a calendar year
Annual limit value for the protection of human health	Calendar year	40 µg/m <sup>3</sup> PM <sub>10</sub>

## Sulphur dioxide

	<i>Averaging period</i>	<i>Limit value</i>
Hourly limit value for the protection of human health	1 hour	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a calendar year
Daily limit value for the protection of human health	24 hours	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a calendar year
Limit value for the protection of ecosystems	Calendar year and winter (1st October to 31st March)	20 µg/m <sup>3</sup>

## PART 2

### Margins of tolerance for benzene and nitrogen dioxide

<i>Start of period during which the margin applies</i>	<i>End of period during which the margin applies</i>	<i>Benzene</i>	<i>Nitrogen dioxide (hourly limit value for the protection of human health)</i>	<i>Nitrogen dioxide (annual limit value for the protection of human health)</i>
Coming into force of these Regulations	31st December 2007	3 µg/m <sup>3</sup>	30 µg/m <sup>3</sup>	6 µg/m <sup>3</sup>
1st January 2008	31st December 2008	2 µg/m <sup>3</sup>	20 µg/m <sup>3</sup>	4 µg/m <sup>3</sup>
1st January 2009	31st December 2009	1 µg/m <sup>3</sup>	10 µg/m <sup>3</sup>	2 µg/m <sup>3</sup>

## PART 3

### Target values for Group B pollutants

1. The target values in the table at paragraph 2 in each case relate to the total content of the relevant pollutant in the PM<sub>10</sub> fraction averaged over one calendar year.
2. The attainment date for each of these target values is 31st December 2012.

<i>Pollutant</i>	<i>Target value</i>
Arsenic	6 ng/m <sup>3</sup>
Benzo(a)pyrene	1 ng/m <sup>3</sup>
Cadmium	5 ng/m <sup>3</sup>
Nickel	20 ng/m <sup>3</sup>

## PART 4

### Target values and long-term objectives for ozone

#### 3. In this Part–

- (a) all values shall be expressed in µg/m<sup>3</sup>;
- (b) the volume shall be standardised at the following conditions of temperature and pressure: 293K and 101.3kPa;
- (c) the time shall be specified in Central European Time;
- (d) “AOT40” (expressed in (µg/m<sup>3</sup>).hours) means the sum of the difference between hourly concentrations greater than 80 µg/m<sup>3</sup> (which equals 40 parts per billion) and 80 µg/m<sup>3</sup> over a given period using only the 1 hour values measured between 08:00 and 20:00 Central European Time each day; and
- (e) in order to be valid, the annual data on exceedances used to check compliance with the target values and long-term objectives below must meet the criteria set out in Part 2 of Schedule 12.

#### Target values

The attainment date for the target values set out in the following table is 2010, with compliance assessed over the periods indicated for each target value in the table.

	<i>Parameter</i>	<i>Target value and assessment for 2010<sup>(1)</sup></i>
Target value for the protection of human health	Maximum daily 8-hour mean <sup>(2)</sup>	120 µg/m <sup>3</sup> not to be exceeded on more than 25 days per calendar year averaged over three years <sup>(3)</sup>
Target value for the protection of vegetation	AOT 40, calculated from 1 hour values from May to July	18,000 µg/m <sup>3</sup> .hour averaged over five years <sup>(3)</sup>

- (1) Compliance with target values will be assessed as of this value. That is, 2010 will be the first year the data for which is used in calculating compliance over three or five years, as appropriate.
- (2) The maximum daily 8-hour mean concentration shall be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated shall be assigned to the day on which it ends, that is, the first calculation period for any one day shall be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on the day.
- (3) If the three or five year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values shall be as follows: (i) for the target value for the protection of human health, valid data for one year; and (ii) for the target value for the protection of vegetation, valid data for three years.

*Status: This is the original version (as it was originally made).*

## Long-term objectives

	<i>Parameter</i>	<i>Long-term objective</i>
Long-term objective for the protection of human health	Maximum daily 8-hour mean within a calendar year	120 $\mu\text{g}/\text{m}^3$
Long-term objective for the protection of vegetation	AOT40, calculated from 1 h values from May to July	6,000 $\mu\text{g}/\text{m}^3 \cdot \text{h}$

## SCHEDULE 2

Regulation 8(4)

### Information to be included in an Improvement Plan

1. Localisation of excess pollution–
  - (a) region;
  - (b) city (map); and
  - (c) measuring station (map, geographical co ordinates).
2. General information–
  - (a) type of zone (city, industrial or rural area);
  - (b) estimate of the polluted area ( $\text{km}^2$ ) and of the population exposed to the pollution;
  - (c) useful climatic data;
  - (d) relevant data on topography; and
  - (e) sufficient information on the type of targets requiring protection in the zone.
3. Responsible authorities (names and addresses of persons responsible for the development and implementation of improvement plans).
4. Nature and assessment of pollution–
  - (a) concentrations observed over previous years (before the implementation of the improvement measures);
  - (b) concentrations measured since the beginning of the project; and
  - (c) techniques used for the assessment.
5. Origin of pollution–
  - (a) list of the main emission sources responsible for pollution (map);
  - (b) total quantity of emissions from these sources (tonnes/year); and
  - (c) information on pollution imported from other regions.
6. Analysis of the situation–
  - (a) details of those factors responsible for the excess (transport, including cross-border transport, formation); and
  - (b) details of possible measures for improvement of air quality.
7. Details of those measures or projects for improvements which existed prior to 21st November 1996–
  - (a) local, regional, national, international measures; and
  - (b) observed effects of these measures.

8. Details of those measures or projects adopted with a view to reducing pollution following 21st November 1996–

- (a) listing and description of all the measures set out in the project;
- (b) timetable for implementation; and
- (c) estimate of the improvement of air quality planned and of the expected time required to attain these objectives.

9. Details of the measures or projects planned or being researched for the long term.

10. List of the publications, documents, and work used to supplement information required by this Schedule.

### SCHEDULE 3

Regulation 11(7)

#### Alert and information thresholds

### PART 1

#### Alert thresholds for nitrogen dioxide and sulphur dioxide

Nitrogen dioxide	400 µg/m <sup>3</sup> measured over three consecutive hours at locations representative of air quality over at least 100 km <sup>2</sup> or an entire zone or agglomeration, whichever is the smaller
Sulphur dioxide	500 µg/m <sup>3</sup> measured over three consecutive hours at locations representative of air quality over at least 100 km <sup>2</sup> or an entire zone or agglomeration, whichever is the smaller

### PART 2

#### Alert and information thresholds for ozone

	<i>Parameter</i>	<i>Threshold</i>
Alert threshold	1 hour average <sup>(1)</sup>	240 µg/m <sup>3</sup>
Information threshold	1 hour average	180 µg/m <sup>3</sup>

(1) For the purposes of regulation 11 (action plans), exceedance of the 1 hour average in respect of the alert threshold is to be measured or predicted for three consecutive hours.

**Status:** This is the original version (as it was originally made).

## SCHEDULE 4

Regulation 2(1) Regulation 13(6)

## Assessment thresholds

## PART 1

## Assessment thresholds for Group A pollutants

**Benzene**

	<i>Annual average</i>
Upper assessment threshold	70% of limit value (3.5 µg/m <sup>3</sup> )
Lower assessment threshold	40% of limit value (2 µg/m <sup>3</sup> )

**Carbon monoxide**

	<i>Eight-hour average</i>
Upper assessment threshold	70% of limit value (7 mg/m <sup>3</sup> )
Lower assessment threshold	50% of limit value (5 mg/m <sup>3</sup> )

**Lead**

	<i>Annual average</i>
Upper assessment threshold	70% of limit value (0.35 µg/m <sup>3</sup> )
Lower assessment threshold	50% of limit value (0.25 µg/m <sup>3</sup> )

**Nitrogen dioxide (NO<sub>2</sub>) and oxides of nitrogen (NO<sub>x</sub>)**

	<i>Hourly limit value for the protection of human health (NO<sub>2</sub>)</i>	<i>Annual limit value for the protection of human health (NO<sub>2</sub>)</i>	<i>Annual limit value for the protection of vegetation (NO<sub>x</sub>)</i>
Upper assessment threshold	70% of limit value (140 µg/m <sup>3</sup> ), not to be exceeded more than 18 times in any calendar year	80% of limit value (32 µg/m <sup>3</sup> )	80% of limit value (24 µg/m <sup>3</sup> )
Lower assessment threshold	50% of limit value (100 µg/m <sup>3</sup> ), not to be exceeded more than 18 times in any calendar year	65% of limit value (26 µg/m <sup>3</sup> )	65% of limit value (19.5 µg/m <sup>3</sup> )

**PM<sub>10</sub>**

	<i>24-hour average</i>	<i>Annual average</i>
Upper assessment threshold	60% of limit value (30 µg/m <sup>3</sup> ), not to be exceeded more than 7 times in any calendar year	70% of limit value (14 µg/m <sup>3</sup> )
Lower assessment threshold	40% of limit value (20 µg/m <sup>3</sup> ), not to be exceeded more than 7 times in any calendar year	50% of limit value (10 µg/m <sup>3</sup> )

**Sulphur dioxide**

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

**PART 2****Assessment thresholds for Group B pollutants****Arsenic**

Upper assessment threshold	60% of target value (3.6 ng/m <sup>3</sup> )
Lower assessment threshold	40% of target value (2.4 ng/m <sup>3</sup> )

**Benzo(a)pyrene**

Upper assessment threshold	60% of target value (0.6 ng/m <sup>3</sup> )
Lower assessment threshold	40% of target value (0.4 ng/m <sup>3</sup> )

**Cadmium**

Upper assessment threshold	60% of target value (3 ng/m <sup>3</sup> )
Lower assessment threshold	40% of target value (2 ng/m <sup>3</sup> )

*Status: This is the original version (as it was originally made).*

## Nickel

Upper assessment threshold	70% of target value (14 ng/m <sup>3</sup> )
Lower assessment threshold	50% of target value (10 ng/m <sup>3</sup> )

## PART 3

### Determination of representative concentrations

1. The representative concentration of the relevant pollutant shall be determined on the basis of concentrations during the previous five years where sufficient data are available. The upper assessment threshold will be deemed to have been exceeded if it has been exceeded during at least three separate years out of the previous five years. The lower assessment threshold will be deemed to have been equalled or exceeded if it has been equalled or exceeded during at least three separate years out of the previous five years.

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

## SCHEDULE 5

Regulation 15(1), (4), (5) and (7)

### Minimum number of sampling points

## PART 1

### Group A pollutants: human health based limit values and alert thresholds

1. This Part sets out the minimum number of sampling points for fixed measurement of Group A pollutants to assess compliance with limit values for the protection of human health and alert thresholds in zones where fixed measurement is the sole source of information.

### Diffuse sources

<i>Population of zone (thousands)</i>	<i>If concentrations exceed the upper assessment threshold<sup>(1)</sup></i>	<i>If maximum concentrations are between the upper and lower assessment thresholds</i>	<i>For nitrogen dioxide and sulphur dioxide in agglomerations where maximum concentrations are below the lower assessment thresholds</i>
0–249	1	1	not applicable
250–499	2	1	1

(1) For NO<sub>2</sub> and PM<sub>10</sub> to include at least one urban-background station and one traffic-orientated station; this requirement shall also apply to benzene and carbon monoxide provided that it does not increase the number of sampling points.



<i>Population of zone (thousands)</i>	<i>If concentrations exceed the upper assessment threshold<sup>(1)</sup></i>	<i>If maximum concentrations are between the upper and lower assessment thresholds</i>	<i>For nitrogen dioxide and sulphur dioxide in agglomerations where maximum concentrations are below the lower assessment thresholds</i>
500–749	2	1	1
750–999	3	1	1
1,000–1,499	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 or more	10	5	3

(1) For NO<sub>2</sub> and PM<sub>10</sub> to include at least one urban-background station and one traffic-orientated station; this requirement shall also apply to benzene and carbon monoxide provided that it does not increase the number of sampling points.

### Point sources

2. 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.

## PART 2

### Group A pollutants: limit values for the protection of ecosystems or vegetation

3. The following table sets out the 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.

<i>If maximum concentrations exceed the upper assessment threshold</i>	<i>If maximum concentrations are between the upper and lower assessment thresholds</i>
1 station every 20,000 km <sup>2</sup>	1 station every 40,000 km <sup>2</sup>

4. 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.

*Status: This is the original version (as it was originally made).*

## PART 3

### Group B pollutants

5. This Part sets out the minimum number of sampling points for fixed measurement of Group B pollutants to assess compliance with target values for the protection of human health in zones where fixed measurement is the sole source of information.

#### Diffuse sources

<i>Population of zone (thousands)</i>	<i>If maximum concentrations exceed the upper assessment threshold<sup>(1)</sup></i>		<i>If maximum concentrations are between the upper and lower assessment thresholds</i>	
	<i>Arsenic, Cadmium, Nickel</i>	<i>Benzo(a)pyrene</i>	<i>Arsenic, Cadmium, Nickel</i>	<i>Benzo(a)pyrene</i>
0–749	1	1	1	1
750–1999	2	2	1	1
2000–3749	2	3	1	1
3750–4749	3	4	2	2
4750–5999	4	5	2	2
≥6000	5	5	2	2

(1) To include at least one urban-background station and for benzo(a)pyrene also one traffic-oriented station provided this does not increase the number of sampling points.

#### Point sources

6. For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement shall be determined taking into account emission densities, the likely distribution patterns of ambient air pollution and potential exposure of the population. The sampling points should shall be sited such that the application of the measures referred to at regulation 7(2) (b) can be monitored.

## PART 4

### Ozone

7. Except in so far as otherwise provided by regulation 15(5) or (6), the minimum number of sampling points for fixed continuous measurement to assess air quality in view of compliance with the target values, long-term objectives and information and alert thresholds where continuous measurement is the sole source of information is set out in the following table below.

<i>Population of zone (thousands)</i>	<i>Agglomerations (urban and suburban)<sup>(1)</sup></i>	<i>Other zones (suburban and rural)<sup>(1)</sup></i>	<i>Rural background</i>
0–249	1	1	1 station/50,000 km <sup>2</sup> as an average density over all zones in Scotland <sup>(2)</sup>
250–499	1	2	
500–999	2	2	
1,000–1,499	3	3	
1,500–1,999	3	4	
2,000–2,749	4	5	
2,750–3,749	5	6	
3,750 or more	1 additional station per 2 million inhabitants	1 additional station per 2 million inhabitants	

(1) At least 1 station in suburban areas, where the highest exposure of the population is likely to occur. In agglomerations at least 50% of the stations should shall be located in suburban areas.

(2) 1 station per 25,000 km<sup>2</sup> for complex terrain is recommended.

## PART 5

### Ozone: minimum number of sampling points for fixed measurements for zones attaining the long-term objectives

**8.** In cases where zones attain the long-term objectives, the number of sampling points for ozone shall, in combination with other means of supplementary assessment such as air quality modelling and co-located nitrogen dioxide measurements, be sufficient to examine the trend of ozone pollution and check compliance with the long-term objectives.

**9.** The number of stations located in agglomerations and other zones may be reduced to one third of the number specified in the Table in Part 4 of this schedule. Where information from fixed measurement stations is the sole source of information, at least one monitoring station shall be kept. If, in zones where there is supplementary assessment, the result of this is that a zone has no remaining station, co-ordination with the number of stations in neighbouring zones must ensure adequate assessment of ozone concentrations against long-term objectives.

**10.** The number of rural background stations should shall be 1 per 100,000 km<sup>2</sup>.

SCHEDULE 6

Regulation 15(3) and (8) Regulation 17(2)  
(b)(ii) Regulation 19(2)(b) Regulation  
20(3)(b)

Location of sampling points

**PART 1**

**Macroscale siting for Group A pollutants**

**Sampling points for the protection of human health**

1. Sampling points directed at the protection of human health shall be sited to provide data on:—
  - (a) areas within zones 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 relevant limit value; and
  - (b) concentrations in other areas within the zones which are representative of the exposure of the general population.
2. Sampling points shall in general be sited to avoid measuring very small micro-environments in their immediate vicinity. Where possible, the Scottish Ministers shall locate sampling points so as to be representative of air quality in a surrounding area of no less than 200 m<sup>2</sup> at traffic-orientated sites and of several square kilometres at urban-background sites.
3. Sampling points shall also, where possible, be representative of similar locations not in their immediate vicinity.
4. Account shall be taken of the need to locate sampling points on islands, where that is necessary for the protection of human health.

**Protection of ecosystems and vegetation**

5. 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. Where possible, the Scottish Ministers shall locate sampling points so as to be representative of air quality in a surrounding area of at least 1000 km<sup>2</sup>. A sampling point may 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.

**PART 2**

**Macroscale siting for Group B pollutants and polycyclic aromatic hydrocarbons**

6. The sites of sampling points shall be selected in such a way as to provide data on—
  - (a) the areas within zones where the population is likely to be directly or indirectly exposed to the highest concentrations averaged over a calendar year;
  - (b) concentrations in other areas within zones which are representative of the exposure of the general population;
  - (c) deposition rates representing the indirect exposure of the population through the food chain.

7. Sampling points shall in general be sited so as to avoid measuring very small micro-environments in their immediate vicinity. Where possible, the Scottish Ministers shall locate sampling points so as to be representative of air quality in surrounding areas of no less than 200 m<sup>2</sup> at traffic-orientated sites, at least 250 m × 250 m at industrial sites, where feasible, and several square kilometres at urban-background sites.

8. Where the objective is to assess background levels the sampling site shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than a few kilometres (as the Scottish Ministers may determine in light of the circumstances of each case).

9. Where contributions from industrial sources are to be assessed, at least one sampling point shall be installed downwind of the source in the nearest residential area. Where the background concentration is not known, an additional sampling point shall be situated within the main wind direction. In particular in cases falling within regulation 9(1)(a), the sampling points shall be sited such that the application of the measures referred to at regulation 7(2)(b) can be monitored.

10. Sampling points shall also, where possible, be representative of similar locations not in their immediate vicinity. Where appropriate they shall be co-located with sampling points for PM<sub>10</sub>.

## PART 3

### Macroscale siting for ozone

11. Sampling points for ozone shall be located in accordance with the considerations set out in the following table—

<i>Type of station</i>	<i>Objective of measurement</i>	<i>Representativeness<sup>(1)</sup></i>	<i>Macroscale siting criteria</i>
Urban	<i>Protection of human health: to assess the exposure of the urban population to ozone, i.e. where the population density and ozone concentration are relatively high and representative of the exposure of the general population</i>	A few km <sup>2</sup>	Away from the influence of local emissions such as traffic, petrol stations etc.; vented locations where well mixed levels can be measured; locations such as residential and commercial areas of cities, parks (away from the trees), big streets or squares with very little or no traffic open areas characteristic of education, sports or recreation facilities
Suburban	<i>Protection of human health and vegetation: to assess the exposure of the population and vegetation located</i>	Some tens of km <sup>2</sup>	At a certain distance from the area of maximum emissions, downwind following the main wind

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

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<i>Type of station</i>	<i>Objective of measurement</i>	<i>Representativeness<sup>(1)</sup></i>	<i>Macroscale siting criteria</i>
	in the outskirts of the agglomeration, where the highest ozone levels, to which the population and vegetation is likely to be directly or indirectly exposed, occur		direction during conditions favourable to ozone formation; where population, sensitive crops or natural ecosystems located in the outer fringe of an agglomeration are exposed to high ozone levels; where appropriate, some sub urban stations also upwind of the area of maximum emissions, in order to determine the regional background levels of ozone
Rural	<i>Protection of human health and vegetation:</i> to assess the exposure of population, crops and natural ecosystems to sub-regional scale ozone concentrations	Sub-regional levels (a few km <sup>2</sup> )	Stations can be located in small settlements and/or areas with natural ecosystems, forests or crops; representative for ozone away from the influence of immediate local emissions such as industrial installations and roads; at open area sites, but not on higher mountain-tops
Rural background	<i>Protection of vegetation and human health:</i> to assess the exposure of crops and natural ecosystems to regional-scale ozone concentrations as well as exposure of the populations	Regional/national/continental levels (1,000 to 10,000 km <sup>2</sup> )	Station located in areas with lower population density, e.g. with natural ecosystems, forests, far removed from urban and industrial areas and away from local emissions; avoid locations which are subject to locally enhanced formation of near ground inversion conditions, also summits of higher mountains; coastal

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

<i>Type of station</i>	<i>Objective of measurement</i>	<i>Representativeness<sup>(1)</sup></i>	<i>Macroscale siting criteria</i>
			sites with pronounced diurnal wind cycles of local character are not recommended by Directive <a href="#">2002/3/EC</a>
<b>(1)</b> Sampling points shall also, where possible, be representative of similar locations not in their immediate vicinity.			

**12.** For rural and rural background stations, consideration shall be given, where appropriate, to co ordination with the monitoring requirements of Commission Regulation 1091/94(**19**) concerning protection of the Community’s forests against atmospheric pollution.

## PART 4

### Microscale siting

- 13.** The following guidelines shall be met as far as practicable–
- (a) the flow around the inlet sampling probe shall be unrestricted, (and, for ozone sampling, free in an arc of at least 270°) without any obstructions affecting the airflow in the vicinity of the sampler–
    - (i) in the case of Group A and Group B pollutants, the inlet sampling probe shall normally be 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; and
    - (ii) in the case of ozone, the inlet sampling probe shall be away from buildings, balconies, trees and other obstacles by more than twice the height the obstacle protrudes above the sampler;
  - (b) in general, the inlet sampling point shall be between 1.5 m (the breathing zone) and 4 m above the ground. However, higher positions (up to 8 m) may be necessary in some circumstances and (for ozone sampling) in wooded areas. Higher siting may also be appropriate if the station is representative of a large area;
  - (c) 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;
  - (d) the sampler’s exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided;
  - (e) in relation to the location of traffic orientated samplers for Group A and Group B pollutants:–
    - (i) 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;
    - (ii) for nitrogen dioxide and carbon monoxide, inlets shall be no more than 5 m from the kerbside; and
    - (iii) for PM<sub>10</sub>, lead, benzene and Group B pollutants, inlets shall be sited so as to be representative of air quality near to the building line;

**(19)** O.J. No L 125, 18.05.94, p.1.

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- (f) for ozone, the inlet probe shall be positioned well away from such sources as furnaces and incineration flues and more than 10 m from the nearest road, with distance increasing as a function of traffic intensity; and
- (g) for deposition measurements in rural background areas as respects Group B pollutants and other pollutants falling within regulations 19 and 20, the European Monitoring and Evaluation of Pollutants guidelines and criteria shall be applied as far as practicable and where not provided for elsewhere in these Regulations.

**14.** The following factors may also be taken into account—

- (a) interfering sources;
- (b) security;
- (c) access;
- (d) availability of electrical power and telephone communications;
- (e) visibility of the site in relation to its surroundings;
- (f) safety of public and operators;
- (g) the desirability of co-locating sampling points for different pollutants;
- (h) planning requirements.

## PART 5

### Documentation and review of site selection

**15.** 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.

**16.** For ozone, this requires screening and interpretation of the monitoring data in the context of the meteorological and photochemical processes affecting the ozone concentrations measured at the respective site.

## SCHEDULE 7

Regulation 15(6)(b) Regulation 16(1)

### Requirements for assessment methods other than fixed measurement

## PART 1

### Group A pollutants

**1.** The following information shall be compiled for zones within which sources other than fixed measurement are employed to supplement information from fixed measurement or as the sole means of air quality assessment—

- (a) a description of assessment activities carried out;
- (b) the specific methods used, with references to descriptions of the method;
- (c) the sources of data and information;



- (d) a description of results, including uncertainties and, in particular, the extent of any area or, if relevant, the length of road within the zone over which concentrations exceed the limit value or, as may be, the limit value plus applicable margin of tolerance and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold; and
  - (e) 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.
2. Where possible maps shall be compiled showing concentration distributions within each zone.

## PART 2

### Group B pollutants

#### **Requirements for air quality models**

3. Where an air quality model is used for assessment, references to descriptions of the model and information on the uncertainty shall be compiled. The uncertainty for modelling is defined as the maximum deviation of the measured and calculated concentration levels, over a full year, without taking into account the timing of the events.

#### **Requirements for objective estimation techniques**

4. Where objective estimation techniques are used, the uncertainty shall not exceed 100%.

#### **Standardisation**

5. For substances to be analysed in the PM<sub>10</sub> fraction, the sampling volume shall refer to ambient conditions.

## PART 3

### Ozone and ozone precursor substances

6. The following information shall be compiled for zones within which sources other than fixed measurement are employed to supplement information from measurement–
- (a) a description of the assessment activities carried out;
  - (b) specific methods used, with references to descriptions of the method;
  - (c) sources of data and information;
  - (d) a description of results, including uncertainties and, in particular, the extent of any area within the zone over which concentrations exceed long-term objectives or target values; and
  - (e) for long-term objectives or target values whose object is the protection of human health, the population potentially exposed to concentrations in excess of the threshold.
7. The Scottish Ministers shall ensure that maps are compiled showing concentration distributions within each zone.

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## SCHEDULE 8

Regulation 16(2) Regulation 17(2)(d)  
Regulation 19(4) Regulation 20(4)

## Data quality objectives

## PART 1

Group A pollutants and PM<sub>2.5</sub>**Group A pollutants (other than benzene and carbon monoxide) and PM<sub>2.5</sub>**

1. The data-quality objectives set out in the following table for the required uncertainty of assessment methods, of minimum time coverage and of data capture of measurement are laid down to guide quality assurance programmes—

	<i>Sulphur dioxide, nitrogen dioxide and oxides of nitrogen</i>	<i>Lead, PM<sub>2.5</sub> and PM<sub>10</sub></i>
<i>Continuous measurement</i>		
Uncertainty	15%	25%
Minimum data capture	90%	90%
<i>Indicative measurement</i>		
Uncertainty	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)
<i>Modelling</i>		
Uncertainty		
Hourly averages	50%–60%	
Daily averages	50%	
Annual averages	30%	50%
<i>Objective estimation</i>		
Uncertainty	75%	100%

2. The uncertainty of the measurement is defined as that set out in the “Guide to the Expression of Uncertainty of Measurements” (ISO 1993)(20) or in ISO 5725-1 “Accuracy (trueness and precision) of measurement methods and results” (ISO 1994). The percentages in the table at paragraph 1 are given for individual measurements averaged, over the period considered, by the limit value, for a

(20) Copies of International Standards Organisation publications referred to in this Schedule or in Schedule 9 may be purchased from the British Standards Institution (“BSI”) Sales Department either by telephone (0208 996 9001) or by post from the BSI, Standards House, 389 Chiswick High Road, London W4 4AL, <http://www.bsi-global.com>.

95% confidence interval (bias + two times the standard deviation). The uncertainty for continuous measurements shall be interpreted as being applicable in the region of the appropriate limit value.

3. The uncertainty for modelling and objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered by the limit value, without taking account the timing of the events.

4. 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.

5. The Scottish Ministers may allow for random measurements to be made instead of continuous measurements for lead, PM<sub>2.5</sub> and PM<sub>10</sub> by methods for which uncertainty within the 95% confidence interval with respect to continuous monitoring has been demonstrated to be within 10%. Random sampling shall be spread evenly over the year.

### **Benzene and carbon monoxide**

6. The data quality objectives set out in the following table, for allowed uncertainty of assessment methods, of minimum time coverage and of data capture of measurement are provided to guide quality assurance programmes—

	<i>Benzene</i>	<i>Carbon monoxide</i>
<i>Fixed measurements</i>		
Uncertainty	25%	15%
Minimum data capture	90%	90%
Minimum time coverage	35% urban background and traffic sites (distributed over the year to be representative of various conditions for climate and traffic); 90% industrial sites	
<i>Indicative measurements</i>		
Uncertainty	30%	25%
Minimum data capture	90%	90%
Minimum time coverage	14% (one day's 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)
<i>Modelling</i>		
Uncertainty:		
Eight-hour averages		50%
Annual averages	50%	
<i>Objective estimation</i>		
Uncertainty	100%	75%

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7. The uncertainty (on a 95% confidence interval) of the assessment methods shall be evaluated in accordance with the “Guide to the Expression of Uncertainty of Measurements” (ISO 1993) or the methodology of ISO 5725:1994. The percentages for uncertainty in the table in paragraph 6 are given for individual measurements averaged over the period considered by the limit value, for a 95% confidence interval. The uncertainty for the fixed measurements shall be interpreted as being applicable in the region of the appropriate limit value.

8. The uncertainty for modelling and objective estimation is defined as the maximum 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.

9. 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.

10. The Scottish Ministers may allow for random measurements to be made instead of continuous measurements for benzene if the uncertainty, including the uncertainty due to random sampling, meets the quality objective of 25%. Random sampling shall be spread evenly over the year.

## PART 2

### Group B pollutants, polycyclic aromatic hydrocarbons and total gaseous mercury

11. The data quality objectives set out in the following table are provided to guide quality assurance—

	<i>Benzo(a)pyrene</i>	<i>Arsenic, cadmium and nickel</i>	<i>Polycyclic aromatic hydrocarbons and total gaseous mercury</i>	<i>Total deposition</i>
<i>Uncertainty</i>				
Fixed and indicative measurements	50%	40%	50%	70%
Modelling	60%	60%	60%	60%
<i>Minimum data capture</i>	90%	90%	90%	90%
<i>Minimum time coverage</i>				
Fixed measurements	33%	50%		
Indicative measurements <sup>(1)</sup>	14%	14%	14%	33%
<b>(1)</b> Indicative measurement being measurements which are performed at reduced regularity but fulfil the other data quality objectives.				

12. The uncertainty (expressed at a 95% confidence level) of the methods used for the assessment of ambient air concentrations shall be evaluated in accordance with the CEN Guide to the Expression

of Uncertainty in Measurement (ENV 13005-1999)(21), the methodology of ISO 5725:1994, and the guidance provided in the CEN Report, “Air quality – Approach to uncertainty estimation for ambient air reference measurement methods” (CR 14377:2002E). The percentages for uncertainty in the table in paragraph 11 are given for individual measurements, which are averaged over typical sampling times, for a 95% confidence interval. The uncertainty of the measurements shall be interpreted as being applicable in the region of the appropriate target value. Fixed and indicative measurements shall be evenly distributed over the year in order to avoid skewing of results.

13. The requirements for minimum data capture and time coverage do not include losses of data due to regular calibration or normal maintenance of the instrumentation. Twenty-four-hour sampling is required for the measurement of benzo(a)pyrene and polycyclic aromatic hydrocarbons. With care, individual samples taken over a period of up to one month may be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. Where the three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, are difficult to resolve analytically, they may be reported as sum. The Scottish Ministers shall endeavour, in so far as practicable, to undertake twenty-four hour sampling for the measurement of arsenic, cadmium and nickel concentrations. Sampling shall be spread evenly over the weekdays and the year. For the measurement of deposition rates the Scottish Ministers shall endeavour, in so far as practicable, to obtain monthly, or weekly, samples throughout the year.

14. The Scottish Ministers may allow for use of wet only instead of bulk sampling if it can be demonstrated to their satisfaction that the difference between them is within 10%. Deposition rates shall generally be given as  $\mu\text{g}/\text{m}^3$  per day.

15. The Scottish Ministers may apply a minimum time coverage lower than indicated in the table at paragraph 11, but not lower than 14% for fixed measurements and 6% for indicative measurements provided that they are satisfied that it can be demonstrated that the 95% expanded uncertainty for the annual mean, calculated from the data quality objectives in the table at paragraph 11 according to ISO 11222:2002 – “Determination of the uncertainty of the time average of air quality measurements” will be met.

## PART 3

### Ozone and related nitrogen oxide and nitrogen dioxide assessed at ozone sampling points

16. The data quality objectives set out in the following table, for allowed uncertainty of assessment methods, of minimum time coverage and of data capture of measurement, are provided to guide quality-assurance programmes–

<i>For ozone, NO and NO<sub>2</sub> assessed at ozone sampling points</i>	
<i>Continuous fixed measurement</i>	
Uncertainty of individual measurements	15%
Minimum data capture	90% during summer; 75% during winter
<i>Indicative measurement</i>	
Uncertainty of individual measurements	30%

(21) European Committee for Standardisation (CEN) publication; (copies may be obtained from CEN at 36, Rue de Stassart, B 1050, Brussels, Belgium, <http://www.cenorm.be>).

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<i>For ozone, NO and NO<sub>2</sub> assessed at ozone sampling points</i>	
Minimum data capture	90%
Minimum time coverage	>10% during summer
<i>Modelling</i>	
Uncertainty	
1 hour averages (daytime)	50%
8 hours daily maximum	50%
<i>Objective estimation</i>	
Uncertainty	75%

**17.** The uncertainty (on a 95% confidence interval) of the measurement methods shall be evaluated in accordance with the principles laid down in the “Guide to the Expression of Uncertainty of Measurements” (ISO 1993) or the methodology in ISO 5725-1 “Accuracy (trueness and precision) of measurement methods and results” (ISO 1994) or equivalent. The percentages for uncertainty in the table at paragraph 16 are given for individual measurements, averaged over the period for calculating target values and long-term objectives, for a 95% confidence interval. The uncertainty for continuous fixed measurements shall be interpreted as being applicable in the region of the concentration used for the appropriate threshold.

**18.** The uncertainty for modelling and objective estimation means the maximum deviation of the measured and calculated concentration levels, over the period for calculating the appropriate threshold, without taking into account the timing of events.

**19.** “Time coverage” means the percentage of time considered for settling the threshold value during which the pollutant is measured.

**20.** “Data capture” means the ratio of the time for which the instrument produces valid data, to the time for which the statistical parameter or aggregated value is to be calculated.

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

## SCHEDULE 9

Regulation 16(3) Regulation 19(4)

Regulation 20(4)

## Reference methods

## PART 1

## Group A pollutants

	<i>Reference method</i>
Sampling and measurement of benzene	EN 14662:2005, Parts 1, 2 and 3 “Ambient air quality – standard method for measurement of benzene concentrations”(22)
Analysis of carbon monoxide	EN 14626:2005 “Ambient air quality – Standard method for the measurement of the concentration of carbon monoxide by nondispersive infrared spectroscopy”
Sampling of lead	The same reference method as for PM <sub>10</sub>
Analysis of lead	ISO 9855: 1993 Ambient air – Determination of the particulate lead content of aerosols collected in filters. Atomic absorption spectroscopy method
Analysis of nitrogen dioxide and oxides of nitrogen	ISO 7996: 1985 Ambient air – determination of the mass concentrations of nitrogen oxides – chemiluminescence method
Sampling and measurement of PM <sub>10</sub>	EN 12341:1998 “Air Quality – Field Test Procedure to Demonstrate Reference Equivalence of Sampling Methods for the PM <sub>10</sub> fraction of particulate matter”. The measurement principle is based on the collection on a filter of the PM <sub>10</sub> fraction of ambient particulate matter and the gravimetric mass determination
Analysis of sulphur dioxide	ISO/FDIS 10498 (Standard in draft) Ambient air – determination of sulphur dioxide – ultraviolet fluorescence method

(22) This standard is issued by the European Committee for Standardisation (CEN); (copies may be obtained from CEN at 36, Rue Stassart B-1050, Brussels, Belgium, <http://www.cenorm.be>).

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## PART 2

### Group B pollutants in ambient air

	<i>Reference method</i>
Sampling of Group B pollutants other than benzo(a)pyrene	The same method as for sampling and measurement of PM <sub>10</sub>
Analysis of Group B pollutants other than benzo(a)pyrene	EN 14902:2005 “Ambient air quality – standard method for the measurement of Pb, Cd, As and NI in the PM <sub>10</sub> fraction of suspended particulate matter”
Benzo(a)pyrene concentrations	A method based on manual PM <sub>10</sub> sampling equivalent to EN 12341

## PART 3

### Ozone

	<i>Reference method</i>
Measurement of ozone	EN 14625:2005 “Ambient air quality – standard method for the measurement of the concentration of ozone by ultraviolet photometry”

## PART 4

### Other reference methods

	<i>Reference method</i>
Sampling and analysis of polycyclic aromatic hydrocarbons in ambient air	A method based on manual PM <sub>10</sub> sampling equivalent to EN 12341
Sampling and analysis of mercury in ambient air	An automated method based on Atomic Absorption Spectrometry or Atomic Fluorescence Spectrometry
Sampling and analysis of the deposition of Group B pollutants, mercury, and polycyclic aromatic hydrocarbons	A method based on the exposition of cylindrical deposit gauges with standardised dimensions



## SCHEDULE 10

Regulation 18

## Ozone precursor substances

**Objectives**

1. The main objectives of measurements of ozone precursor substances are to analyse any trend in ozone precursors, to check the efficiency of emission reduction strategies, to check the consistency of emission inventories and to help attribute emission sources to pollution concentration.

2. An additional aim is to support the understanding of ozone formation and precursor dispersion processes, as well as the application of photochemical models.

**Substances**

3. Measurements of ozone precursor substances shall include at least nitrogen oxides, and appropriate volatile organic compounds. For the purposes of this Schedule, “volatile organic compounds” means all organic compounds from anthropogenic and biogenic sources, other than methane, that are capable of producing photochemical oxidants by reaction with nitrogen oxides in the presence of sunlight.

4. The Scottish Ministers shall, in particular, consider measuring the following volatile organic compounds–

Ethane	1-Butene	Isoprene	Ethyl benzene
Ethylene	trans-2-Butene	n-Hexane	m+p-Xylene
Acetylene	cis-2-Butene	i-Hexane	o-Xylene
Propane	1.3-Butadiene	n-Heptane	1,2,4-Trimeth. benzene
Propene	n-Pentane	n-Octane	1,2,3-Trimeth. benzene
n-Butane	i-Pentane	i-Octane	1,3,5-Trimeth. benzene
i-Butane	1-Pentene	Benzene	Formaldehyde
	2-Pentene	Toluene	Total non-methane hydrocarbons

**Reference methods**

5. The reference method for the analysis of oxides of nitrogen shall be ISO 7996:1985, Ambient air – determination of the mass concentrations of nitrogen oxides – chemiluminescence method.

**Monitoring sites**

6. Measurements shall be taken in particular in urban and suburban areas at any monitoring site considered appropriate with regard to the objectives set out in this Schedule.

SCHEDULE 11

Regulation 24(1)

Public information where alert or information thresholds are exceeded

**PART 1**

**Alert thresholds for nitrogen dioxide and sulphur dioxide**

- 1.** In cases where the alert thresholds for nitrogen dioxide or sulphur dioxide are exceeded, the information 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 concentration (improvement, stabilisation, or deterioration), together with the reasons for those changes;
    - (ii) the geographical area concerned; and
    - (iii) the duration of the occurrence;
  - (c) the type of population potentially sensitive to the occurrence; and
  - (d) the precautions to be taken by the sensitive population concerned.

**PART 2**

**Alert and information thresholds for ozone**

- 2.** In cases where either the information threshold or the alert threshold for ozone—
  - (a) is exceeded; or
  - (b) is predicted to be exceeded,the details set out in paragraphs 3 to 6 shall, as a minimum, be made available to the public on a sufficiently large scale.
- 3.** Information on any observed exceedance—
  - (a) the location or area of the exceedance;
  - (b) the type of threshold exceeded (information threshold or alert threshold);
  - (c) the time at which the exceedance began and its duration; and
  - (d) the highest 1-hour and 8-hour mean concentration.
- 4.** Forecast for the following afternoon, day or days—
  - (a) the geographical area of expected exceedances of an information threshold or alert threshold; and
  - (b) the expected change in pollution, that is, improvement, stabilisation or deterioration.
- 5.** Information on the type of population concerned, possible health effects and recommended conduct, in particular—
  - (a) information on population groups at risk;
  - (b) description of likely symptoms;
  - (c) recommended precautions to be taken by the population concerned; and

(d) where to find further information.

6. Information provided under this Schedule shall also include–

- (a) information on preventive action to reduce pollution and/or exposure to it;
- (b) an indication of main source sectors; and
- (c) recommendations for action to reduce emissions.

SCHEDULE 12

Regulations 26(2)(a) & 29

Collation of information and criteria for aggregating data and calculating statistical parameters

PART 1

Information to be submitted to the Commission

1. The following information on ozone concentrations shall be obtained and collated–

	<i>Type of station</i>	<i>Level</i>	<i>Averaging/accumulation time</i>	<i>Provisional data for each month from April to September</i>	<i>Report for each year</i>
Information threshold	Any	180µg/m <sup>3</sup>	1 hour	For each day with any exceedance: date, total hours of, exceedance, maximum 1 hour ozone and related NO <sub>2</sub> values when required and monthly 1 hour maximum ozone	For each day with any exceedance: date, total hours of, exceedance, maximum 1 hour ozone and related NO <sub>2</sub> values, when required
Alert threshold	Any	240µg/m <sup>3</sup>	1 hour	For each day with any exceedance: date, total hours of, exceedance, maximum 1 hour ozone and related	For each day with any exceedance: date, total hours of, exceedance, maximum 1 hour ozone and related

(1) Maximum daily 8-hour mean.

(2) In this table, “AOT40” has the same meaning as in paragraph 3(d) of Part 4 of Schedule 1.

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	<i>Type of station</i>	<i>Level</i>	<i>Averaging/accumulation time</i>	<i>Provisional data for each month from April to September</i>	<i>Report for each year</i>
Health protection	Any	120µg/m <sup>3</sup>	8 hours	NO <sub>2</sub> values, when required For each day with any exceedance: date, 8 hours maximum <sup>(1)</sup>	NO <sub>2</sub> values, when required For each day with any exceedance: date, 8 hours maximum <sup>(1)</sup>
Vegetation protection	Suburban, rural, rural background	AOT40 <sup>(2)</sup> = 6,000 µg/m <sup>3</sup> .h	1 hour, accumulated from May to June		Value
Forest protection	Suburban, rural, rural background	AOT40 <sup>(2)</sup> = 20,000µg/m <sup>3</sup> .h	1 hour, accumulated from April to September		Value
Materials	Any	40 µg/m <sup>3</sup>	1 year		Value

(1) Maximum daily 8-hour mean.

(2) In this table, "AOT40" has the same meaning as in paragraph 3(d) of Part 4 of Schedule 1.

2. The Scottish Ministers shall also ensure that the following information is collated—

- (a) for ozone, nitrogen dioxide, oxides of nitrogen and the sums of ozone and nitrogen dioxide (added as parts per billion and expressed in µg/m<sup>3</sup> ozone) the maximum, 99.9th, 98th and 50th percentiles and annual average and number of valid data from hourly series; and
- (b) the maximum, 98th and 50th percentile and annual average from a series of daily 8-hour ozone maxima.

3. Data collated in monthly reports shall be considered provisional and shall be updated where necessary in subsequent submissions.

## PART 2

### Criteria for aggregating data and calculating statistical parameters

4. In this Part, percentiles are to be calculated using the method specified in Council Decision [97/101/EC\(23\)](#) establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within member States.

5. The following criteria are to be used for checking validity when aggregating data and calculating statistical parameters—

(23) O.J. L 35, 05.02.97, p.14.

<i>Parameter</i>	<i>Required proportion of valid data</i>
1 hour values	75% (45 minutes)
8 hour values	75% of values (6 hours)
Maximum daily 8 hours mean from hourly running 8 hours averages	75% of the hourly running 8 hour averages (18 8 hours averages per day)
AOT40 <sup>(1)</sup>	90% of the 1 hour values over the time period defined for calculating the AOT40 value <sup>(2)</sup>
Annual mean	75% of the 1 hour values over summer (April to September) and winter (January to March, October to December) seasons separately
Number of exceedances and maximum values per month	90% of the daily maximum 8 hours mean value (27 available daily values per month)
	90% of the 1 hour values between 08:00 and 20:00 Central European Time
Number of exceedances and maximum values per year	Five out of six summer months over the summer season (April to September)

(1) In this table “AOT40” has the same meaning as in paragraph 3(d) of Part 4 of Schedule 1.

(2) In cases where all possible measured data are not available, the following factor shall be used to calculate AOT40 values: AOT40 (estimate) = AOT40 measured x (total possible number of hours ÷ number of measured hourly values). The reference in this formula to the total possible number of hours is to the hours within the time period of AOT40 definition (that is, 08:00 to 20:00 Central European Time from 1st May to 31st July each year, for vegetation protection and from 1st April to 30th September each year for forest protection).

## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

These Regulations extend to Scotland only.

These Regulations implement the following Directives:

Council Directive [96/62/EC](#) on ambient air quality assessment and management (O.J. No L 296, 21.11.96, p.55);

Council Directive [1999/30/EC](#) relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (O.J. No L 163, 29.06.99, p.41);

Directive [2000/69/EC](#) of the European Parliament and of the Council relating to limit values for benzene and carbon monoxide in ambient air (O.J. No L 313, 13.12.00, p.12);

Directive [2002/3/EC](#) of the European Parliament and of the Council relating to ozone in ambient air (O.J. No L 67, 09.03.02, p.14); and

Directive [2004/107/EC](#) of the European Parliament and of the Council relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (O.J. No L 23, 26.01.05, p.3) (“the Fourth Daughter Directive”).

These Regulations also incorporate requirements imposed by the following:

Commission Decision [2001/744/EC](#) amending Annex V to Council Directive [1999/30/EC](#) (O.J. No L 278, 23.10.01, p.35);

Directive [2003/35/EC](#) of the European Parliament and of the Council providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives [85/337/EEC](#) and [96/61/EC](#) (O.J. No L 156, 25.06.03, p.17); and

Commission Decision [2004/279/EC](#) concerning guidance for implementation of Directive [2002/3/EC](#) of the European Parliament and of the Council relating to ozone in ambient air (O.J. No. L 87, 25.3.04, p.50).

In addition to providing for the transposition of the Fourth Daughter Directive, these Regulations consolidate and replace the Air Quality Limit Values (Scotland) Regulations 2003 ([S.S.I. 2003/428](#)) (as amended by the Air Quality Limit Values (Scotland) Amendment Regulations 2003 ([S.S.I. 2003/547](#)) and the Air Quality Limit Values (Scotland) Amendment Regulations 2005 ([S.S.I. 2005/300](#))), all of which are revoked by regulation 30. Those Regulations previously implemented for Scotland the air quality Directives referred to above except the Fourth Daughter Directive.

Regulation 3 designates the Scottish Ministers as the competent authority for the purposes of Article 3 (implementation and responsibilities) of Council Directive [96/62/EC](#).

Chapter 1 of Part 2 of these Regulations requires the attainment of air quality standards in respect of the concentration of various pollutants in ambient air. In accordance with regulation 6 and Schedule 1, limit values are imposed for “Group A” pollutants (benzene, carbon monoxide, lead, nitrogen dioxide and oxides of nitrogen, particulate matter (PM<sub>10</sub>) and sulphur dioxide); target values are imposed for “Group B” pollutants (arsenic, benzo(a)pyrene, cadmium and nickel, and their compounds) within the PM<sub>10</sub> fraction; and target values and long-term objectives are imposed for ozone. For the purposes of this Part, regulation 5 requires the Scottish Ministers to divide Scotland into zones within which the necessary air quality management and assessment takes place.

Chapter 2 of Part 2 sets out the measures the Scottish Ministers are required to take in order to ensure attainment of the relevant standards. The measures ordinarily required are those set out in regulation 7. In relation to benzene or nitrogen dioxide, where concentrations exceed the limit value plus the margin of tolerance specified, the Scottish Ministers are required by regulation 8(2) to prepare and implement an improvement plan. The Scottish Ministers are also required to prepare and implement an improvement plan by regulation 8(3) in cases where concentrations of ozone exceed the target value, unless the Scottish Ministers consider that the target value would not be attainable through proportionate measures. Schedule 2 makes provision as to the content of improvement plans. Regulation 9 requires the Scottish Ministers to take the measures specified in cases where concentrations of Group B pollutants exceed the relevant target value or in cases where concentrations of ozone comply with the target value but exceed a long-term objective.

Regulation 10 requires the Scottish Ministers to maintain compliance with the limit values and target values and, as far as the factors specified in that regulation permit, the long-term objectives for ozone. Regulation 11 requires the Scottish Ministers to prepare and, to the extent they consider necessary, implement, action plans which indicate the measures to be taken in cases where there is a risk that any limit value or the alert thresholds for nitrogen dioxide and sulphur dioxide will be exceeded. The Scottish Ministers are also obliged to consider the preparation of action plans where there is a risk that the alert threshold for ozone will be exceeded. Alert thresholds are set out in Schedule 3.

Regulation 12 requires the Scottish Ministers to assess the concentration of Group A pollutants, Group B pollutants and ozone within each zone. Regulations 13 to 16 and Schedules 4 to 9 prescribe the assessment methods which are required or permitted (as the case may be), and the detailed requirements in relation to each method (for instance, requirements as to sampling points for fixed measurement).

Regulations 17 to 19 require the Scottish Ministers to monitor or measure, respectively, PM<sub>2.5</sub>, ozone precursor substances and certain polycyclic aromatic hydrocarbons. Schedule 10 makes specific provision for the measurement of ozone precursor substances. Regulation 20 requires the taking of indicative measurements of the concentration and deposition of Group B pollutants, basic polycyclic aromatic hydrocarbons and mercury.

Regulations 21 to 25 and Schedule 11 require the Scottish Ministers to make up-to-date information available to the public, including organisations representing relevant public interests. Regulation 26 requires the production of an annual report for ozone and regulation 27 requires action and improvement plans, and information as to their implementation, to be made available. Regulation 28 requires the Scottish Ministers to consult the public in the preparation, modification and review of improvement plans. Regulation 29 requires the Scottish Ministers to obtain and collate certain information contained in Schedule 12.