SCHEDULE 7

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

# PART I

## RELEVANT POLLUTANTS : DATA-QUALITY OBJECTIVES

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

| | *Sulphur dioxide, nitrogen dioxide and oxides of nitrogen* | *Particulate matter and lead* |
|---|---|---|
| Continuous measurement | | |
| Accuracy | 15% | 25% |
| Minimum data capture | 90% | 90% |
| Indicative measurement | | |
| Accuracy | 25% | 50% |
| Minimum data capture | 90% | 90% |
| Minimum time coverage | 14% (One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.) | 14% (One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.) |
| Modelling | | |
| Accuracy | | |
| Hourly averages | 50%–60% | |
| Daily averages | 50% | |
| Annual averages | 30% | 50% |
| Objective estimation | | |
| Accuracy: | 75% | 100% |

**1.2** The accuracy of the measurement is defined as laid down in the "Guide to the Expression of Uncertainty of Measurements" (ISO 1993)(**1**) or in ISO 5725-1 "Accuracy (trueness and precision) of measurement methods and results" (ISO 1994(**1**). The percentages in the table are given for individual measurements averaged, over the period considered, by the limit value, for a

(**1**) The copies of the International Standards Organisation publications referred to in these Regulations can be purchased from the British Standards Institution "BSI" sales department either by telephone on 0208-996-9001 or by post from the BSI, Standards House, 389 Chiswick High Road, London W4 4AL.

(**1**) The copies of the International Standards Organisation publications referred to in these Regulations can be purchased from the British Standards Institution "BSI" sales department either by telephone on 0208-996-9001 or by post from the BSI, Standards House, 389 Chiswick High Road, London W4 4AL.

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

**1.3** The accuracy 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.

**1.4** 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.

**1.5** The Scottish Ministers may allow for random measurements to be made instead of continuous measurements for particulate matter and lead by methods for which accuracy within the 95% confidence interval with respect to continuous monitoring has been demonstrated to be within 10%. Random sampling must be spread evenly over the year.

**1.6** The following data quality objectives, for allowed uncertainty of assessment methods, of minimum time coverage and of data capture of measurement are provided to guide quality assurance programmes.

| | *Benzene* | *Carbon monoxide* |
|---|---|---|
| Fixed measurements | | |
| 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)<br>90% industrial sites | |
| Indicative measurements | | |
| 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 8 weeks evenly distributed over the year) | 14% (one measurement a week at random, evenly distributed over the year, or 8 weeks evenly distributed over the year) |
| Modelling | | |
| Uncertainty | – | 50% |
| Eight-hour averages Annual averages | 50% | – |
| Objective estimation | | |
| Uncertainty | 100% | 75% |

**1.7** 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 above table 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 should be interpreted as being applicable in the region of the appropriate limit value.

**1.8** 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.

**1.9** 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.

**1.10** 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 must be spread evenly over the year.