IV. Criteria for determining numbers of sampling points for fixed measurement of concentrations of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air

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

(a) Diffuse sources

Population of agglomeration or zone (thousands)	*If maximum concentrations exceed the upper assessment threshold* (1)		*If maximum concentrations are between the upper and lower assessment thresholds*	
	As, Cd, Ni	*B(a)P*	*As, Cd, Ni*	*B(a)P*
0 − 749	***1***	***1***	***1***	***1***
750 − 1 999	***2***	***2***	***1***	***1***
2 000 − 3 749	***2***	***3***	***1***	***1***
3 750 − 4 749	***3***	***4***	***2***	***2***
4 750 − 5 999	***4***	***5***	***2***	***2***
≥ 6 000	***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.

(b) Point sources

For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement should 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 be sited such that the application of best available techniques as defined by Article 2(11) of Directive 96/61/EC can be monitored.

ANNEX IV

DATA QUALITY OBJECTIVES AND REQUIREMENTS FOR AIR QUALITY MODELS

I. Data quality objectives

The following data quality objectives are provided as a guide to quality-assurance.

	Benzo(a)pyrene	Arsenic, cadmium and nickel	Polycyclic aromatic hydrocarbons other than benzo(a)pyrene, total gaseous mercury	***Total deposition***
Uncertainty				
Fixed and Indicative measurements	50 %	40 %	50 %	***70 %***
Modelling	***60 %***	***60 %***	***60 %***	***60 %***
− Minimum data capture	90 %	90 %	90 %	***90 %***
− Minimum time coverage:				
Fixed Measurements	33 %	50 %	−	
Indicative measurements (1)	14 %	14 %	14 %	***33 %***

(1) ***Indicative measurement being measurements which are performed at reduced regularity but fulfil the other data quality objectives.***

The uncertainty (expressed at a 95 % confidence level) of the methods used for the assessment of ambient air concentrations will be evaluated in accordance with the principles of the CEN Guide to the Expression of Uncertainty in Measurement (***ENV*** 13005-1999), 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 are given for*** individual measurements, which are averaged over typical sampling times***, for a 95 % confidence interval***. The uncertainty of the measurements should be interpreted as being applicable in the region of the appropriate ***target value. Fixed and indicative measurements must be evenly distributed over the year in order to avoid skewing of results.***

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 other polycyclic aromatic hydrocarbons. ***With care, individual samples taken over a period of up to one month can be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. The three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene can be difficult to resolve analytically. In such cases they can be reported as sum. Twenty-four hour sampling*** is also advisable for the measurement of arsenic, cadmium and nickel concentrations. Sampling must be spread evenly over the weekdays and the year. For the measurement of deposition rates monthly, ***or weekly,*** samples throughout the year are recommended. ***Member States may use wet only instead of bulk sampling if they can demonstrate that the difference between them is within 10 %. Deposition rates should generally be given as μg/m² per day.***

Member States may apply a minimum time coverage lower than indicated in the table, but not lower than 14 % for fixed measurements and 6 % for indicative measurements provided that they can demonstrate that the 95 % expanded uncertainty for the annual mean, calculated from the data quality objectives in the table according to ISO 11222:2002 — 'Determination of the uncertainty of the time average of air quality measurements' will be met.

II. Requirements for air quality models

Where an air quality model is used to 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.***

III. Requirements for objective estimation techniques

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

IV. Standardisation

For substances to be analysed in the PM10 fraction the sampling volume refers to ambient conditions.