QA/QC checks on air quality data in AIRBASE and on the EoI2004 data

Procedures and results

ETC/ACC Technical paper 2005/3
September 2005

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Summary

This report is the product mentioned in the 2005 Subvention Implementation Plan (task 1.4.2.4., subtask 2) as "QA/QC Technical Report" and describes the quality control/quality assurance process in the EoI data stream (see ETC/ACC, 2005). This reported is focussed upon the quality of the measurement data delivered in the framework of the Exchange of Information (EU, 1997), while the yearly EoI Technical report (Buijsman *et al,* 2004; Mol *et al,* 2005) treats on the meta information (networks, stations and measurement configurations) in the EoI. In this report both the quality procedures and the results of the quality checks will be described.
In 2004 two quality checks on AIRBASE. have been taken place, one on phantom stations and one on PM_{10} correction factors. After that, the data delivered in the framework of the EoI2004, are quality checked. All quality checks are reported to the data suppliers. The data suppliers were asked to give feedback.
The response on the feed back actions was very high. The quality of AIRBASE has been improved considerably.
Next year in 2006, the results of the feedback actions will be placed on the Web, while a summary will be included in the EoI2005 Technical report. The QA/QC procedures will be recorded in a separate document.

Contents

1. INTRODUCTION

Within the European Union a procedure to exchange information on air quality has been laid down in Council Decision 97/101/EC (EU, 1997) of 27 January 1997 *establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States* (the "Exchange of Information decision" or shortly EoI decision). Technical details such as pollutants covered, information on stations and networks to be communicated are specified in the annexes of the Decision. These annexes were amended by Commission Decision 2001/752/EC (EU, 2001a and 2001b). Data submission followed the Guidance on the revised Annexes of the Decision (Garber *et al.*, 2002). Formally the EoI applies only to the EU Member States, however, upon request of the European Environmental Agency, a number of non-EU countries provides, on a voluntary basis, information on air quality following the requirements of the EoI Decision. In this way, information on a pan-European scale has become available.

According to the EoI Decision, the European Commission has to prepare each year a technical report on meta information and air quality data exchanged, and has to make the information available to Member States in a database. The decision also states that the Commission will call upon the European Environment Agency (EEA) with regard to the operation and practical implementation of the information system. The European Topic Centre on Air Quality and Climate Change (ETC/ACC), under contract to EEA, manages the database system, AIRBASE. The information submitted under the EoI is stored in AIRBASE and made available to the public on the Internet via the ETC/ACC website [1]. AIRBASE can be accessed interactively via the Web interface AIRVIEW but it is also possible to download XML dumps of the whole database. The technical report mentioned above is prepared annually by the ETC/ACC (Buijsman *et al.*, 2004a). The technical report for the EoI-2004 data exchange is in preparation (Mol *et al.*, 2005b).

This report focuses on the QA/QC aspects of the data in AIRBASE. Last year ETC/ACC has made a QA/QC plan on the data in AIRBASE (Buijsman *et al.*, 2004b). Several QA/QC actions are described. This report gives the results of QA/QC actions done in 2004 on data already available in AIRBASE and the quality feedback actions on the data delivered in the framework of the EoI-2004 data exchange.

2. FEEDBACK ACTIONS IN 2004

2.1 Phantom stations and questionable station coordinates

In AIRBASE there were several stations and/or measurement configurations for which no measurement data were stored. If there are no measurement data available for these stations and/or measurement configurations there is no use for keeping these meta information stored in AIRBASE. It is, however, possible that historical data exist for these stations but that these data were not yet uploaded in AIRBASE
To clear AIRBASE from these stations and measurement configurations ETC/ACC had distributed an overview of these so called phantom stations and measurement configurations. The data suppliers were asked to look at these overviews and, if there were measurement data available belonging to these stations and/or measurement configurations, to send these results. Otherwise, if the data supplier did not recognize and/or did not have any results of these stations and/or measurement configurations,

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[1] http://etc-acc.eionet.eu.int/databases/airbase.html or http://airbase.eionet.eu.int

the data supplier was asked to inform the ETC/ACC. The ETC/ACC had removed these meta information from AIRBASE.
The overview reports were sent out on 9 September 2004. If ETC/ACC did not receive any comments on these overviews before 1 October 2004, ETC/ACC assumed that the stations and measurement configurations in the overviews could be seen as phantom stations and phantom measurement configurations and therefore could be stored in an off-line archive and deleted from AIRBASE.
The data supplier was also asked to look at questionable station coordinates and station characteristics. The data supplier was asked to correct this questionable information in the DEM or in the overview spreadsheets.

The table below summarises the countries which has been addressed in this action and when a reply has been received. The detailed reports on phantom stations and/or meaduring configurations together with the replies of the countries are available at Circa (see: http://eea.eionet.eu.int:8980/Members/irc/eionet-circle/airclimate/library?l=/phantom_feedback_2004&vm=detailed&sb=Title).

Country	Phantom Stations	Phantom meas conf.	Suspect coordinates	Suspect station char.	Reply received
AT	x	x	x		17-sep-2004
BE	x	x			10-sep-2004
BG	x	x			
CH	x	x			5-okt-2004
CZ	x	x			
DE	x	x	x	x	30-sep-2004
DK	x	x			
EE	x	x			10-sep-2004
ES	x	x	x		30-sep-2004
FI	x	x			
FR	x	x	x	(x)	20-9-2004/12-10-2004
GB	x	x	x		14-sep-2004
GR	x	x	x		
HU	x	x			
IE	x	x	x		
IT	x	x	x		29-sep-2004
LT	x	x			
LU	x	x			
LV		x			
MK	x	x			14-sep-2004
NL	x	x			
NO		x			
PL		x			
PT	x	x			
RO	x				
SE	x	x			
SI		x			14-sep-2004
SK	x	x			9-sep-2004

ETC/ACC has processed the replies of the countries and has removed the phantom stations of the countries which do not have given a reply.

The status of the removal of phantom stations and measurement configurations can be found in the following table.

For each country the following information is listed:
- phantom stations found (Stations -> X)
- phantom stations removed (Stations -> date of removal)
- phantom measurement configurations found (Meas.configurations -> X)
- phantom measurement configurations removed (Meas.configurations -> date of removal)

The phantom stations in ES, IT and SK (partly) are not yet removed; in 'remarks' the status placed.

Country		Stations		Meas.configurations		Nr Phant. Stat. deleted	Remarks
AL	Albania						
AT	Austria	X	30/12/2004	X	30/12/2004	1	
BA	Bosnia-Herzegovina						
BE	Belgium	X	29/12/2004	X	29/12/2004	42	
BG	Bulgaria	X	29/12/2004	X	29/12/2004		
CH	Switzerland	X	29/12/2004	X	29/12/2004	5	
CS	Serbia and Montenegro						
CY	Cyprus						
CZ	Czech Republic	X	29/12/2004	X	29/12/2004	7	
DE	Germany	X	24/12/2004	X	24/12/2004	57	294 stations are left in AirBase: new stations which have not yet data
DK	Denmark	X	29/12/2004	X	29/12/2004	14	
EE	Estonia	X	29/12/2004	X	29/12/2004	4	
ES	Spain	X		X		0	ES replied: agreed with deletion; not yet removed (1172 stations)
FI	Finland	X	29/12/2004	X	29/12/2004	3	
FR	France	X	11/07/2005	X	11/07/2005	449	
GB	United Kingdom	X	30/12/2004	X	30/12/2004	156	105 stations are left in AirBase: report next year
GR	Greece	X	29/12/2004	X	29/12/2004	14	
HR	Croatia						
HU	Hungary	X	29/12/2004	X	29/12/2004	7	
IE	Ireland	X	29/12/2004	X	29/12/2004	45	
IS	Iceland						
IT	Italy	X		X		0	IT replied: they tried to solve the problems using DEM(meta-import-module): There are still fantom stations/meas.config. in AirBase (377 stations)
LI	Liechtenstein						
LT	Lithuania	X	29/12/2004	X	29/12/2004	10	

LU	Luxembourg	X	29/12/2004	X	29/12/2004	17	
LV	Latvia			X	29/12/2004		
MK	FYR of Macedonia	X		X		0	MK replied: no phantom stations; keep in AirBase (4 stations)
MT	Malta						
NL	Netherlands	X	29/12/2004	X	29/12/2004	158	
NO	Norway		29/12/2004	X	29/12/2004		
PL	Poland		29/12/2004	X	29/12/2004	1	
PT	Portugal	X	29/12/2004	X	29/12/2004	59	
RO	Romania	X	29/12/2004			25	
SE	Sweden	X	29/12/2004	X	29/12/2004	3	
SI	Slovenia		29/12/2004	X	29/12/2004		
SK	Slovak Republic	X		X		2	SK replied: Two phantom stations can be removed; 2 stations left in AirBase: will deliver data; NO-mc's are removed.
TR	Turkey						

In total 1079 phantom stations are removed from AIRBASE; 1954 stations without data are left from which 1549 (ES, IT and SK) are not yet removed, and 405 will be populated with data.

2.2 Correction factors

Submission of information on the measurement method is a non-mandatory item (see Annex A, Table A.2). However in case of PM_{10}, intercomparison exercises of different PM_{10} monitoring methods showed large deviations from the European Reference Method (as described in CEN standard EN 12341). It was recognised that results from non-reference methods have to be corrected and enhanced efforts to harmonise the PM-measurements in the EU are needed. (EU, 2003). For a correct interpretation of the PM10 and PM2.5 data, information on the measuring methods is needed. Information in AIRBASE on PM_{10} and $PM_{2.5}$ measuring methods has to be screened on completeness and correctness. So far no provisions have been made in the regular EoI delivery to submit information on correction factors which have been applied by countries to the results from automated instruments.

In April 2004 the ETC/ACC had sent out an inquiry to the data suppliers. This inquiry was intended to gather information on current PM_{10} monitoring practices and the use of correction factors for PM_{10} measurement data. Most countries have replied to the inquiry. Thereafter, it was followed by an intensive e-mail correspondence with requests for supplementary information, clarification etc. The results of this inquiry are given in the document "Correction factors and PM_{10} measurements in AIRBASE (Buijsman *et al.*, 2004c).

3. FEEDBACK ACTIONS ON EoI 2004-DATA

3.1 The annual data transmission cycle of the Exchange of Information

Each year the software data exchange tool DEM is pre-filled in June with all meta-information on known EoI, EuroAirnet or EMEP stations available in AIRBASE and distributed to the participating countries.

Before 1 October the participating countries submit meta-information and raw air quality data in one of the agreed formats (see EU, 2001a) to the Commission and/or to EEA. Receipt of the data is acknowledged by the ETC/ACC.

In the period from 1 October until mid January of the next year the received data are uploaded in AIRBASE. During the upload process the data are checked
• on outliers,
• on missing essential meta data,
• on possible overwriting of data already stored in AIRBASE ,
• on possible deletion of stations or measurement configurations with data.
In case irregularities are found, feedback reports are sent to the data suppliers. The data supplier is informed and asked to confirm the changes. In the period mid January until the end of February the feedback is processed and in March the statistics and exceedances are calculated in AIRBASE. So, from 1 April the newly submitted data are publicly available in AIRBASE.

The ETC is responsible for a correct transfer of data into AIRBASE. Updated copies of AIRBASE are regularly made available on the web. AIRBASE contains both raw data and aggregated and statistical data. To ensure consistency between the raw (hourly) data and aggregated data (daily means, daily 8h maxima) on the one hand and the statistical parameters on the other hand the calculation of a standard set of annual statistical parameters is done under the responsibility of the ETC (see Annex B). In AIRBASE only the statistical parameters calculated by ETC are stored. Only in case a country delivers statistical parameters without the underlying raw data, the delivered statistical parameters are made available in AIRBASE.

The ETC will not make any modification in raw data and/or meta information without prior written permission of the owner of the data (that is the Member State represented by the NRC and data supplier). In case ambiguous information has been received, the NRC and data supplier will be contacted and asked to check the information and - if needed - to deliver correct information. As long as a feedback has not been received, the ambiguous data are flagged and made inaccessible to the extern users of AIRBASE. In case the NRC and data supplier of a EU Member State decide that raw data have to be deleted from AIRBASE, DG Environment is informed.

3.2 QA/QC in the DEM.

The EoI clearly indivcates that the countries are responsible for validation of the data. To assist the data supplier in this task a number of QA/QC checks are built-in in the DEM. Except from checks on mandatory items, these built-in checks are optionally The data supplier has several possibilities to check the quality of the (meta) data in the DEM before sending it to ETC/ACC. The meta data can be added, modified and/or deleted interactively (by screens) and via import files. Several (automatic) checks and controls are performed. Error messages and warnings are given for mandatory, essential and desired (important) parameters. Also checks are performed for the data values. Information is given on the unit value of the components. The data itself can be checked by visual inspection (graphs, bar charts). Also the measurement data can be checked on outliers. For each component a default lower and upper value is defined, but it is also possible to change these values (per country) into a country dependent lower and upper value. For the description of these QA/QC procedures in the DEM see the manual (Mol, 2005a).

3.3 ETC/ACC checks on meta information

During the upload process of AirBase the ETC/ACC performs several QA/QC checks on the meta information. This is important because, when AIRBASE information is used for air quality assessments, problems may arise if the (meta) information delivered is incomplete. The ETC/ACC sends a report with the following items:

1. Components reported. This is just for information. No action expected from the data supplier (see example annex D).

2. The lack of certain types of meta information makes the proper use of measurement results questionable or diminishes the value of measurement results. From a user perspective, therefore, ´essential meta information´ is defined (Buijsman *et al.*, 2004b). The following parameters are defined as essential:
    *   Station characteristics in terms of type of station and area.
    *   Geographical co-ordinates and altitude.
    *   Station name.
    If one of these items is missing or is possibly in error, the data supplier is urgently requested for updating. Note that this "essential" set is largely covered by the mandatory items; only the *type of station* is additionally included. The report contains a list of stations for which one or more essential meta data are missing. The data supplier is asked to look to the meta data of the listed stations and fill in the missing meta data using the available DEM-database. If the data supplier doesn't give a reaction, nothing is changed. ETC/ACC will remind the data supplier of these erroneous and missing meta data in next feedback actions. If the data supplier gives a reply, it is not sure, that the reply is complete. Therefore, each year the ETC/ACC will make a report on missing essential meta data. (see example annex E).

3. The report gives also an overview of re-submitted data; data which are already stored in AIRBASE and are now overwritten by new information. The data supplier is asked to confirm if it was indeed an intended resubmission. The previously stored results are overwritten by the resubmitted data. A back-up of the old data has been made outside AIRBASE. If this resubmission was unintended and the data supplier wants to restore the old data, he has to inform ETC/ACC. Then ETC/ACC will restore the old data and consider the resubmission as not taken place. If the data supplier doesn't answer before a certain deadline date, nothing changes: the old results remain overwritten by the resubmitted data. (see example annex F).

4. The report gives also an overview of stations and/or measurement configurations which have been marked as 'to be deleted' but air quality data and/or statistics are attached to these stations and/or measurement configurations. The data supplier is asked to confirm if he really wants to remove the meta-data including the data stored in AIRBASE. The Commission will be informed and after their permission the data will be removed from AIRBASE. If the data supplier doesn't give a reaction, the stations and/or measurement configurations remain marked as 'to be deleted' and are not physically removed from AIRBASE. ETC/ACC will remind the data supplier of these stations and/or measurement configurations 'to be deleted' in next feedback actions. (see example annex G).

5. The report gives an overview of stations and/or measurement configurations which have been marked as 'to be deleted'. Since no data are attached to these stations and/or measurement configurations ETC/ACC has removed these meta data from AIRBASE. This is just for information. No action expected from the data supplier (see example annex H).

3.4 ETC/ACC checks on air quality measurement data

According to the EoI all transmitted data are deemed to be valid. Member states have to ensure that a quality assurance procedure is in place which meets in general the objectives of the EoI and the AQ daughter directives. Therefore, the ETC/ACC has not implemented any validation procedure. However, the DEM provides tools for screening the (meta) data (mapping of stations, visualisation of time series, detection of outliers). Before loading the data in AIRBASE, the ETC/ACC is systematically screening the AQ data for outliers following the procedure described in Annex C. The feedback report also contains results of the outlier-check performed on the reported data. Remark: ETC/ACC only checked the incoming data; data already stored in AIRBASE are not checked on outliers.
The outlier-values which are detected by the ETC/ACC are marked within AIRBASE as suspicious data and are not available for reporting during the feedback process. Since the outlier-check is an automatic process, ETC/ACC afterwards examined the detected outliers and assigned a classification to these outliers.

The following classification of outliers is defined (see also example annex I):
Green   Outside ETC/ACC outlier limit values, but seems to be ok.
Yellow   Outside ETC/ACC outlier limit values and looks indeed strange.
Red   Outside ETC/ACC outlier limit values, and looks indeed suspicious.

In the column 'Comment' a motivation of the classification is described.

So, if there are outliers detected in the report the data supplier is asked to respond in one of the two ways:
A. If all of the assumed outliers for one specific component and average time are correct data, the data supplier is asked to inform about this including a suggestion for the right outlier limit values which apply for his country; these results are then be demarked and the outlier limit value(s) are adjusted.
B. If one or more of the assumed outliers are indeed invalid or wrongly reported, the data supplier is asked to resubmit these data using the adjusted DEM.

If a remark is appended in the sheet 'outliers (general)' like "**check unit",** then all the results of this component and average time are marked as suspicious data (red). The data supplier is asked to check whether the unit he used for reporting is according the EoI decision. If not, the data supplier is asked to resubmit these data in the correct unit using the adjusted DEM-database. In practice it concerns components like CO (mg/ m^3 instead of μg/m^3 and ng/ m^3 instead of μg/m^3 for heavy metals)

If the data supplier doesn't give a reaction on these questions, than:
• the green outlier results will be demarked, so they are supposed to be correct
• the yellow and red outlier results remain marked as incorrect, so they are not visible in AIRBASE
• the wrong unit outliers will be demarked, so they are visible in spite of their possible incorrectness.

Results of this feedback action are available at Circa:

http://eea.eionet.eu.int/Members/irc/eionet-
circle/airclimate/library?l=/qaqc_country_feedback&vm=detailed&sb=Title

The status of the feedback reports sent to the countries and the reactions received are listed in the annexes J and K.

4. FURTHER ACTIONS TO IMPROVE THE QUALITY OF AIRBASE

Besides the QA/QC actions which are already mentioned in Chapter 3 various other actions to improve the quality of the information in AIRBASE can be defined (see (Buijsman *et al.*, 2004b). The following quality actions are described in the ETC/ACC Implementation Plan 2005:

- Filling the time gaps: In AIRBASE substantial data gaps exist for the period up to 1998 which hampers a European –wide assessment of systematic changes in air quality over the last 10-20 year. In line with Article 5(4) Member States have responsibility to submit historical data for the period 1989-1998 where available. Emphasis will be laid on the components of the daughter directives. At various occasions (e,g the annual Air Quality EIONET workshop) the ETC/ACC has reminded the Member States to this obligation.

- Adding accreditation flags: Measurement data in AIRBASE originate from many different monitoring networks throughout Europe and are subject to different QA/QC regimes. Larssen *et al.* (1999) proposed a set of QA/QC criteria for classification and subsequent selection of air quality monitoring stations to be included in EUROAIRNET. These QA/QC criteria can be used in AIRBASE to flag data. By doing so, users can select data from AIRBASE according to their own quality criteria or intended quality of their product.

  Data suppliers can import this classification parameter into the DEM. At the moment 131 from the 463 European networks with data are classified. The data suppliers will be asked to classify the other networks.

- Checking station coordinates. There are stations in AIRBASE which are not situated outside the reporting country or are located in the sea. To correct the coordinates of these stations the EEA has prepared maps for each country with the station locations to identify these wrong station coordinates. Overview rtables of incorrect meta-information have been prepared and sent to the data suppliers by the ETC/ACC. The feedback of the countries is expected during the EoI-2005 data exchange cycle.

Suggestions for additional QA/QC actions are given in the report *QA/QC plan for air quality data collecting under the Exchange of Information decision* (Buijsman *et al.*, 2004b). Depending on budget and priorities, these actions might be addressed in future years.

5. OVERVIEW AND SUMMARY OF THE REGULAR EOI AND AD HOC QA/QC ACTIONS

Regular QA/QC actions on EoI(data year n-1) in year n and n+1

Date	Year	Processes by data supplier	Processes by ETC/ACC
1 June	n		Release of the DEM
		Modifying meta data in the DEM	Help desk
		Checking meta data in the DEM	
		Import raw data into the DEM	
		Checking raw data in the DEM	
		Submit to CIRCA	
1 Oct	n		Upload DEM into AirBase
			Checks on outliers, missing essential meta data, resubmission old data, deletion stations/meas. conf with data
			Sending reports to the data suppliers
		Replies on the feedback reports	
mid Jan	n+1	Additional feedback	Processing of the (non) replies
1 March	n+1		Calculation of statics and exceedances
1 Apr	n+1		Release of AirBase with EoIn data
			Generating XML dumps

Ad hoc QA/QC actions in year n			
Date	Year	Processes by data supplier	Processes by ETC/ACC
1 Apr	n		Feedback reports on
			phantom stations
			PM10 correction factors
			Erronous station coordinates (incl. reminder missing essential meta data)
			See chapter 4
		Replying on feedback reports	
1 Apr – 1 June		1 April-1 June : reply with spreadsheets	
1 Apr – 1 Oct		1 June-1 Oct : reply in the DEM	

6. RECOMMENDATIONS

The feedback actions on the yearly EoI deliveries should be further optimized. Optimizing is only possible in cooperation with the data suppliers. The data supplier has to be stimulated to use the DEM not only for the regular EoI delivery but also for processing the feedback. The feedback information can than directly be uploaded in AirBase. The data supplier has to be stimulated also to use the checking facilities in the DEM including the outlier checks. During the DEM-workshop in May 2005 at the EEA this point has been directly addressed. Using these DEM checks saves the ETC/ACC a lot of work.

Other feedback actions which still need attention are:
- the phantom stations (there are still 1549 phantom stations which will not receive data left)
- the PM10 corrections factors for other years than 2002
- filling the time gaps

- completing the QA/QC parameters for the networks
- completing the correctness of the station coordinates (including the altitude)

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ANNEX A EXCHANGE OF INFORMATION

The Exchange of Information Decision requires a large set of meta information to be delivered to the Commission (EU, 1997, 2001a, 2001b). Part of this information is mandatory (*Table A.1*) and the other items (*Table A.2*) are to be delivered to the Commission 'to the extent possible' and 'as much information as feasible should be supplied".

Table A.1 Overview of mandatory meta information to be delivered under the Exchange of Information (EoI)

Item [a]	Description
I.1.	Name of the network
I.4.1.	Name of the body responsible for network management
I.4.2.	Name of person responsible
I.4.3.	Address
I.4.4.	Telephone and fax numbers
I.5.	Time reference basis
II.1.1.	Name of the station
II.1.4.	Station code given under the present decision and to be provided by the Commission
II.1.8.	Geographical co-ordinates
II.1.10.	Pollutants measured
II.1.11.	Meteorological parameters measured
II.2.1.	Type of area

(a) Numbers according to Annex II of the EoI (EU, 2001)

Table A.2. Overview of non-mandatory meta information to be delivered under the Exchange of Information (EoI)

Item [a]	Description
I.2.	Abbreviation (of the network)
I.3.	Type of networks
I.4.5.	E-mail (of the body responsible for the network)
I.4.6.	Website address
II.1.2.	Name of the town/city of location (of the station)
II.1.3.	National and/or local reference number or code
II.1.5.	Name of technical body responsible for the station
II.1.6.	Bodies or programmes to which data are reported
II.1.7.	Monitoring objectives
II.1.9.	NUTS level IV
II.1.12	Other relevant information
II.2.2.	Type of station in relation to dominant emission sources
II.2.3.	Additional information about the station
III.1.1.	Name (of measurement equipment)
III.1.2.	Analytical principle or measurement method
III.2.1.	Location of sampling point
III.2.2.	Height of sampling point
III.2.3.	Result-integrating time
III.2.4.	Sampling time

(a) Numbers according to the Annex II of the Exchange of Information (EU, 2001)

Annex B AGGREGATION OF DATA AND CALCULATION OF STATISTICS

In aggregation of hourly data to longer averaging periods (8 hourly, daily) a 75% availability of raw data is required to calculate a valid aggregated value. That is, starting with hourly concentrations:
- a daily averaged concentration is calculated when at least 13 valid hourly values are available with not more than 6 successive hourly values missing;
- a 8-hourly averaged concentration is calculated when at least 6 valid hourly values are available;
- maximum daily 8-hour mean is calculated when at least 18 valid running 8-hour averages per day are available.

Annual statistical parameters as given in Table B.1 are routinely calculated and stored in AIRBASE. The statistical parameters are calculated irrespective of the proportion of valid data (data capture). Criteria on data capture are given both in the EoI decision and in the respective daughter directives. These criteria refer to the use of the monitoring data for checking compliance with air quality limit or target values. The objective of the EoI is not and should not be to replace official reporting and identification of exceedances of air quality limit values. This remains the responsibility of the Member States. For other objectives, these data capturecriteria might be too stringent. Therefore, no rejection criteria have been applied; depending on his application the user has to define his own set of data capture criteria.

Table B.1. Annual statistical parameters

Component	Parameter based on		
	1 hour values	daily values	Daily 8h maxima
Sulphur dioxide (SO_2)	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • hours with c > 350 $\mu g/m^3$ • 25th highest value	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • days with c > 125 $\mu g/m^3$ • 4th highest value	
Nitrogen dioxide (NO_2)	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • hours c > 200 $\mu g/m^3$ • 19th highest value	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	
Nitrogen monoxide (NO)	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	
Nitrogen oxides (NO_x) [b]	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	
Ozone (O_3)	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • AOT40 [a]	• annual mean	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • days with c >120 $\mu g/m^3$, • 26th highest value
Carbon monoxide (CO)	• annual mean	• annual mean	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum
Particulate matter (PM_{10})	• annual mean	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum • days with c > 50 $\mu g/m^3$, • 36th highest value	
other	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	• annual mean • 50 percentile • 95 percentile • 98 percentile • maximum	

(a) AOT40 value is calculated from hourly values between 8.00 and 20.00 CET from 1 May to 31 July according to the definition in the ozone directive (EU, 2002). In all reports an estimated value corrected for missing values will be presented.

(b) Nitrogen oxides, NO_x, are defined as the sum of nitric oxide (NO) and nitrogen dioxide (NO_2) added as part per billion and expressed as nitrogen dioxide in $\mu g/m^3$, that is:

$$C_{NOx} = 46(C_{NO} / 30 + C_{NO2} / 46)$$

where C_{NO} and C_{NO2} are concentrations (in $\mu g/m^3$) of NO and NO_2, respectively, and C_{NOx} is the NO_x concentrations in μg NO_2-equivalent/m^3. In case at a specific station for a specific hour no information on NO_x has been submitted but if valid values have been submitted both for NO and NO_2, the missing hourly NO_x value will be calculated according to above equation.

ANNEX C DETECTION OF OUTLIERS.

In DEM a module is added which enables the user to check on outliers on the imported hourly and daily values. If outliers are detected, a report is generated informing the user. With the help of this report, the user can determine whether the detected outliers are extreme but correct values, or are caused by wrongly entered data values during import.

The procedure simply checks whether the concentration falls within the interval spanned by a given minimum and maximum value. Default minimum and maximum values are given in Table C.1; optionally the user can introduce his own interval.

Table C.1. Definition of concentration interval used in outlier check.

Comp. nr	Short component name	Component name	Type	min_value	max_value	unit
1	SO2	Sulphur dioxide	day	-10	337,5	ug/m3
1	SO2	Sulphur dioxide	hour	-10	450	ug/m3
3	SA	Strong acidity	day	-10	337,5	ug SO2/m3
4	SPM	Total suspended particulates	day	-10	525	ug/m3
4	SPM	Total suspended particulates	hour	-10	700	ug/m3
5	PM10	Particulate matter < 10 µm	day	-10	525	ug/m3
5	PM10	Particulate matter < 10 µm	hour	-10	700	ug/m3
6	BS	Black smoke	day	-10	525	ug/m3
7	O3	Ozone	day	-10	300	ug/m3
7	O3	Ozone	hour	-10	400	ug/m3
7	O3	Ozone	hour8	-10	350	ug/m3
8	NO2	Nitrogen dioxide	day	-10	337,5	ug/m3
8	NO2	Nitrogen dioxide	hour	-10	450	ug/m3
9	NOX	Nitrogen oxides	day	-10	1125	ug NO2/m3
9	NOX	Nitrogen oxides	hour	-10	1500	ug NO2/m3
10	CO	Carbon monoxide	day	-10	15	mg/m3
10	CO	Carbon monoxide	hour	-10	20	mg/m3
10	CO	Carbon monoxide	hour8	-10	15	mg/m3
11	H2S	Hydrogen sulphide	hour	-10	35	ug/m3
12	Pb	Lead	day	-10	5	ug/m3
13	Hg	Mercury	day	-10	10	ng/m3
14	Cd	Cadmium	day	-10	50	ng/m3
15	Ni	Nickel	day	-10	200	ng/m3
18	As	Arsenic	day	-10	60	ng/m3
20	C6H6	Benzene	day	-10	35	ug/m3
20	C6H6	Benzene	hour	-10	50	ug/m3
21	C6H5-CH3	Toluene	day	-10	150	ug/m3
21	C6H5-CH3	Toluene	hour	-10	200	ug/m3
22	C6H5-CH=CH2	Styrene	day	-10	3	ug/m3
24	CH2=CH-CH=CH2	1.3 Butadiene	hour	-10	3	ug/m3
25	HCHO	Formaldehyde	day	-10	75	ug/m3
26	CHCl=CCl2	Trichloroethylene	day	-10	3	ug/m3
27	C2Cl4	Tetrachloroethylene	day	-10	3	ug/m3
32	THC (NM)	Total non-methane hydrocarbons	hour	-10	2500	ug C/m3

Comp. nr	Short component name	Component name	Type	min_value	max_value	unit
35	NH3	Ammonia	day	-10	300	ug/m3
35	NH3	Ammonia	hour	-10	300	ug/m3
38	NO	Nitrogen monoxide	day	-10	675	ug/m3
38	NO	Nitrogen monoxide	hour	-10	900	ug/m3
39	HCl	Hydrogen chloride	hour	-10	900	ug/m3
41	CH4	Methane	hour	-10	2400	ug/m3
45	NH4	Particulate ammonium	day	-10	20	ug/m3
46	NO3	Particulate nitrate	day	-10	60	ug/m3
47	SO4 (H2SO4 aerosols) (SO4--)	Particulate sulfate	day	-10	30	ug/m3
63	Zn	Zinc	day	-10	0,5	ug/m3
67	HNO3+NO3	Total nitrate	day	-10	80	ug N/m3
68	NH3+NH4	Total ammonium	day	-10	100	ug N/m3
394	H3C-CH2-CH2-CH3	n-Butane	hour	-10	20	ug/m3
412	k	conductivity	day	-10	3	uS/cm
428	C2H6	Ethane	hour	-10	3	ug/m3
430	Ethene	ethene	hour	-10	6000	pptv
431	C6H5-C2H5	Ethyl benzene	day	-10	3	ug/m3
431	C6H5-C2H5	Ethyl benzene	hour	-10	3	ug/m3
432	HC=CH	Ethyne (Acetylene)	hour	-10	8	ug/m3
441	C7H16	n-Heptane	day	-10	3	ug/m3
441	C7H16	n-Heptane	hour	-10	3	ug/m3
443	C36H14	n-Hexane	day	-10	3	ug/m3
443	C36H14	n-Hexane	hour	-10	3	ug/m3
464	m,p-C6H4(CH3)2	m,p-Xylene	day	-10	10	ug/m3
464	m,p-C6H4(CH3)2	m,p-Xylene	hour	-10	10	ug/m3
475	C8H18	n-Octane	day	-10	3	ug/m3
475	C8H18	n-Octane	hour	-10	3	ug/m3
482	o-C6H4-(CH3)2	o-Xylene	day	-10	3	ug/m3
482	o-C6H4-(CH3)2	o-Xylene	hour	-10	3	ug/m3
486	H3C-(CH2)3-CH3	n-Pentane	hour	-10	3	ug/m3
503	H3C-CH2-CH3	Propane	hour	-10	12	ug/m3
505	CH2=CH-CH3	Propene	hour	-10	5	ug/m3
520	SO2 + SO4--	sum_sulph_diox_sulphate	day	-10	150	ug S/m3
629	Ca++	calcium	day	-10	1	ug/m3
630	Ca++	calcium	day	-10	20	mg/l
631	Cl-	chloride	day	-10	10	ug/m3
632	Cl-	chloride	day	-10	200	mg/l
648	H+	Acidity	day	-10	20	ue H/l
658	K+	potassium	day	-10	30	mg/l
660	Mg++	magnesium	day	-10	20	mg/l
664	NH4+	ammonium	day	-10	15	mg N/l

Comp. nr	Short component name	Component name	Type	min_value	max_value	unit
666	NO3-	nitrate	day	-10	30	mg N/l
669	Na+	sodium	day	-10	150	mg/l
719	SO4--	sulphate	day	-10	30	mg S/l
753	precip_amount	precipitation_amount	day	0	150	mm
2076	pH	pH	day	0	14	pH units
6001	PM2.5	Particulate matter < 2.5 µm	day	-10	525	ug/m3
6001	PM2.5	Particulate matter < 2.5 µm	hour	-10	700	ug/m3
6005	H2C=CH-CH2-CH3	1-Butene	hour	-10	3	ug/m3
6006	H3C-CH=CH-CH3	trans-2-Butene	hour	-10	8	ug/m3
6007	H3C-CH=CH-CH3	cis-2-Butene	hour	-10	3	ug/m3
6011	C6H3-(CH3)3	1,2,4-Trimethylbenzene	day	-10	3	ug/m3
6012	C6H3(CH3)3	1,2,3-Trimethylbenzene	day	-10	3	ug/m3
6013	C6H3(CH3)3	1,3,5-Trimethylbenzene	day	-10	3	ug/m3

(For components not listed in this table min_value = -99 and max_value = 9999 is adopted)

Table C.2.Country definition of concentration interval used in outlier check. For components not listed the default values (see Table C.1) is used.

Country code	Comp. nr.	Short Component name	Component name	Type	min_value	max_value	unit
BE	14	Cd	Cadmium	day	-10	700	ng/m3
BE	15	Ni	Nickel	day	-10	1900	ng/m3
BE	18	As	Arsenic	day	-10	100	ng/m3
BG	1	SO2	Sulphur dioxide	hour	-10	1800	ug/m3
BG	4	SPM	Total suspended particulates	day	-10	1200	ug/m3
BG	11	H2S	Hydrogen sulphide	hour	-10	100	ug/m3
BG	35	NH3	Ammonia	hour	-10	2100	ug/m3
DE	1	SO2	Sulphur dioxide	hour	-10	1000	ug/m3
DE	4	SPM	Total suspended particulates	hour	-10	1100	ug/m3
DE	5	PM10	Particulate matter < 10 µm	hour	-10	2400	ug/m3
DE	20	C6H6	Benzene	hour	-10	400	ug/m3
DE	38	NO	Nitrogen monoxide	hour	-10	1200	ug/m3
DK	38	NO	Nitrogen monoxide	hour	-10	1000	ug/m3
EE	4	SPM	Total suspended particulates	day	-10	800	ug/m3
ES	1	SO2	Sulphur dioxide	day	-10	450	ug/m3
ES	1	SO2	Sulphur dioxide	hour	-10	1200	ug/m3
ES	4	SPM	Total suspended particulates	hour	-10	1200	ug/m3
ES	5	PM10	Particulate matter < 10 µm	day	-10	1400	ug/m3
ES	5	PM10	Particulate matter < 10 µm	hour	-10	1400	ug/m3
ES	8	NO2	Nitrogen dioxide	hour	-10	700	ug/m3
ES	20	C6H6	Benzene	day	-10	100	ug/m3
ES	20	C6H6	Benzene	hour	-10	100	ug/m3

Country code	Comp. nr.	Short Component name	Component name	Type	min_value	max_value	unit
ES	38	NO	Nitrogen monoxide	hour	-10	1200	ug/m3
FI	1	SO2	Sulphur dioxide	day	0	150	ug/m3
FI	1	SO2	Sulphur dioxide	hour	0	500	ug/m3
FI	4	SPM	Total suspended particulates	day	0	1000	ug/m3
FI	5	PM10	Particulate matter < 10 µm	hour	-5	1000	ug/m3
FI	7	O3	Ozone	hour	-2	190	ug/m3
FI	8	NO2	Nitrogen dioxide	hour	-5	250	ug/m3
FI	10	CO	Carbon monoxide	hour	-2	15	mg/m3
GB	1	SO2	Sulphur dioxide	hour	-10	700	ug/m3
GB	9	NOX	Nitrogen oxides	hour	-10	2000	ug NO2/m3
GR	1	SO2	Sulphur dioxide	hour	-10	600	ug/m3
GR	5	PM10	Particulate matter < 10 µm	hour	-10	900	ug/m3
IS	5	PM10	Particulate matter < 10 µm	hour	-10	800	ug/m3
IT	1	SO2	Sulphur dioxide	hour	-10	2700	ug/m3
IT	5	PM10	Particulate matter < 10 µm	hour	-10	1000	ug/m3
IT	8	NO2	Nitrogen dioxide	hour	-10	600	ug/m3
IT	9	NOX	Nitrogen oxides	hour	-10	1900	ug NO2/m3
IT	10	CO	Carbon monoxide	hour	-10	30	mg/m3
IT	11	H2S	Hydrogen sulphide	hour	-10	400	ug/m3
IT	32	THC (NM)	Total non-methane hydrocarbons	hour	-10	3100	ug C/m3
IT	38	NO	Nitrogen monoxide	hour	-10	1100	ug/m3
MK	1	SO2	Sulphur dioxide	day	-10	600	ug/m3
NL	5	PM10	Particulate matter < 10 µm	hour	-10	1300	ug/m3
NL	9	NOX	Nitrogen oxides	hour	-10	1700	ug NO2/m3
NL	24	CH2=CH-CH=CH2	1.3 Butadiene	day	-10	10	ug/m3
NL	27	C2Cl4	Tetrachloroethylene	day	-10	10	ug/m3
NL	38	NO	Nitrogen monoxide	hour	-10	1000	ug/m3
NL	41	CH4	Methane	hour	-10	2700	ug/m3
NL	67	HNO3+NO3	Total nitrate	day	-10	250	ug N/m3
NL	394	H3C-CH2-CH2-CH3	n-Butane	hour	-10	15	ug/m3
NL	412	k	conductivity	hour	-10	110	uS/cm
NL	428	C2H6	Ethane	hour	-10	15	ug/m3
NL	431	C6H5-C2H5	Ethyl benzene	day	-10	15	ug/m3
NL	441	C7H16	n-Heptane	day	-10	5	ug/m3
NL	443	C36H14	n-Hexane	day	-10	20	ug/m3
NL	464	m,p-C6H4(CH3)2	m,p-Xylene	day	-10	70	ug/m3
NL	464	m,p-C6H4(CH3)2	m,p-Xylene	hour	-10	15	ug/m3
NL	475	C8H18	n-Octane	day	-10	10	ug/m3
NL	482	o-C6H4-(CH3)2	o-Xylene	day	-10	10	ug/m3
NL	486	H3C-(CH2)3-CH3	n-Pentane	hour	-10	10	ug/m3

Country code	Comp. nr.	Short Component name	Component name	Type	min_value	max_value	unit
NL	503	H3C-CH2-CH3	Propane	hour	-10	20	ug/m3
NL	505	CH2=CH-CH3	Propene	hour	-10	10	ug/m3
NL	648	H+	Acidity	day	-200	50	ue H/l
NL	6011	C6H3-(CH3)3	1,2,4-Trimethylbenzene	day	-10	6	ug/m3
NL	6012	C6H3(CH3)3	1,2,3-Trimethylbenzene	day	-10	10	ug/m3
NO	1	SO2	Sulphur dioxide	hour	-10	600	ug/m3
PL	5	PM10	Particulate matter < 10 µm	day	-10	600	ug/m3
PL	9	NOX	Nitrogen oxides	hour	-10	1900	ug NO2/m3
PT	1	SO2	Sulphur dioxide	hour	-10	1500	ug/m3
PT	38	NO	Nitrogen monoxide	hour	-10	1500	ug/m3
RO	4	SPM	Total suspended particulates	day	-10	600	ug/m3
RO	12	Pb	Lead	day	-10	20	ug/m3
SE	5	PM10	Particulate matter < 10 µm	hour	-10	800	ug/m3
SI	1	SO2	Sulphur dioxide	hour	-10	2500	ug/m3
SI	5	PM10	Particulate matter < 10 µm	hour	-99	750	ug/m3

ANNEX D EXAMPLE SUMMARY REPORT

Report (summary)

RD_TYPE	CP_NUMBER	CP_NAME	MATRIX	CP_UNIT
Overview components for which data are reported in the year 2004				
by country LT				
week	1	Sulphur dioxide	air	ug/m3
hour	1	Sulphur dioxide	air	ug/m3
day	1	Sulphur dioxide	air	ug/m3
hour	5	Particulate matter < 10 ⱡm	aerosol	ug/m3
hour	7	Ozone	air	ug/m3
week	8	Nitrogen dioxide	air	ug/m3
hour	8	Nitrogen dioxide	air	ug/m3
day	8	Nitrogen dioxide	air	ug/m3
hour	9	Nitrogen oxides	air	ug NO2/m3
hour	10	Carbon monoxide	air	mg/m3
hour	20	Benzene	air	ug/m3
week	67	Total nitrate	air+aerosol	ug N/m3
day	67	Total nitrate	air+aerosol	ug N/m3
week	68	Total ammonium	air+aerosol	ug N/m3
day	68	Total ammonium	air+aerosol	ug N/m3
week	520	sum_sulph_diox_sulphate	air+aerosol	ug S/m3
day	520	sum_sulph_diox_sulphate	air+aerosol	ug S/m3

Report (detail)

RD_TYPE	CP_NUMBER	CP_NAME	MATRIX	CP_UNIT	YEAR	NMBR_STATIONS
Overview components for which data are reported in the year 2004						
by country ZZ						
week	1	Sulphur dioxide	air	ug/m3	2003	2
hour	1	Sulphur dioxide	air	ug/m3	2003	13
day	1	Sulphur dioxide	air	ug/m3	2003	1
hour	5	Particulate matter < 10 ⱡm	aerosol	ug/m3	2003	12
hour	7	Ozone	air	ug/m3	2003	12
week	8	Nitrogen dioxide	air	ug/m3	2003	2
hour	8	Nitrogen dioxide	air	ug/m3	2003	13
day	8	Nitrogen dioxide	air	ug/m3	2003	1
hour	9	Nitrogen oxides	air	ug NO2/m3	2003	8
hour	10	Carbon monoxide	air	mg/m3	2003	7
hour	20	Benzene	air	ug/m3	2003	5
week	67	Total nitrate	air+aerosol	ug N/m3	2003	2
day	67	Total nitrate	air+aerosol	ug N/m3	2003	1
week	68	Total ammonium	air+aerosol	ug N/m3	2003	2
day	68	Total ammonium	air+aerosol	ug N/m3	2003	1

| week | 520 | sum_sulph_diox_sulphate | air+aerosol | ug S/m3 | 2003 | 2 |
| day | 520 | sum_sulph_diox_sulphate | air+aerosol | ug S/m3 | 2003 | 1 |

Description parameters:

Description fields used in sheet:	
RD_TYPE	averaging type (HOUR =hourly values; DAY= daily values)
CP_NUMBER	AIRBASE identification code component
CP_NAME	component name
MATRIX	sample matrix in which component is measured (air, precipitation, aerosol,..)
CP_UNIT	storage unit defined for component
YEAR	year for which data has been reported
NMBR_STATIONS	number of stations for which data has been reported

ANNEX E EXAMPLE REPORT MISSING ESSENTIAL META DATA

Overview missing meta data

COUNTRY	SN_EU_CODE	STATION_NAME	LATITUDE(DEC)	LONGITUDE(DEC)	ALTITUDE	STATION_TYPE	TYPE_OF_AREA	NETWORK_CODE	NETWORK_NAME
									Overview stations with missing essential meta data 2003-data reported in 2004 for the EoI
BE	BE0033A	200709 - GENT	51,0514	3,7344	0	Unknown	urban	556	Other network
BE	BE0114A	LIEGE : 2 202	50,64583333	5,55888889	0	Unknown	unknown	147	NETWORK OF THE STATIONS SURVEYED BY THE BELGIAN INTERREGIONAL CELL FOR THE ENVIRONMENT (CELINE-IRCEL) (Automatic Network - Sulfur Smoke Network - Heavy Metals Network)
BE	BE0114A	LIEGE : 2 202	50,64583333	5,55888889	0	Unknown	unknown	229	RESEAU DE MESURE DES STATIONS DE LA REGION WALLONNE (Automatic Network - Sulfur Smoke Network - Heavy Metals Network)
BE	BE0119A	CHARLEROI : 2 514	50,44333333	4,43444444	0	Unknown	rural	147	NETWORK OF THE STATIONS SURVEYED BY THE BELGIAN INTERREGIONAL CELL FOR THE ENVIRONMENT (CELINE-IRCEL) (Automatic Network - Sulfur Smoke Network - Heavy Metals Network)
BE	BE0119A	CHARLEROI : 2 514	50,44333333	4,43444444	0	Unknown	rural	229	RESEAU DE MESURE DES STATIONS DE LA REGION WALLONNE (Automatic Network - Sulfur Smoke Network - Heavy Metals Network)

Description of table headings:

COUNTRY	2-character ISO-code for country
SN_EU_CODE	identification code station (external AIRBASE code used
	for reporting)
STATION_NAME	station name defined in AIRBASE
LATITUDE	latitude of station (degrees presented as a decimal)
LONGITUDE	longitude of station (degrees presented as a decimal)
ALTITUDE	altitude of station
STATION_TYPE	type of station defined for this station in AIRBASE
TYPE_OF_AREA	type of area defined for this station in AIRBASE
NETWORK_CODE	identification code for network this station is attached to
NETWORK_NAME	network name

ANNEX F EXAMPLE REPORT RESUBMITTED DATA

Overview resubmitted data

Hourly values (summary)

Overview resubmitted measurements (EoI2004) for which data are stored in AIRBASE					
COUNTRY	COMP	NMBR_STATIONS	STARTDATE	ENDDATE	NMBR_RECORDS
BE	CO	3	01.01.2000	31.12.2000	1098

Hourly values (details)

Overview resubmitted measurements (EoI2004) for which data are stored in AIRBASE						
COUNTRY	COMP	STATIONNR	STATIONNAME	STARTDATE	ENDDATE	NMBR_RECORDS
BE	CO	BE0213A	43R201 - LIEGE	01.01.2000	31.12.2000	366
BE	CO	BE0235A	45R501 - CHARLEROI	01.01.2000	31.12.2000	366
BE	CO	BE0237A	45R512 - MARCHIENNE	01.01.2000	31.12.2000	366

Daily values (summary)

Overview resubmitted measurements (EoI2004) for which data are stored in AIRBASE					
COUNTRY	COMP	NMBR_STATIONS	STARTDATE	ENDDATE	NMBR_RECORDS
BE	As	8	01.01.2002	30.12.2002	96
BE	Cd	12	01.01.2002	30.12.2002	144
BE	Ni	9	01.01.2002	30.12.2002	108
BE	Pb	19	01.01.2002	30.12.2002	228

Daily values (details)

Overview resubmitted measurements (EoI2004) for which data are stored in AIRBASE						
COUNTRY	COMP	STATIONNR	STATIONNAME	STARTDATE	ENDDATE	NMBR_RECORDS
BE	As	BE0252A	0LIE02 - LIEGE	01.01.2002	30.12.2002	12
BE	As	BE0278A	0ANG01 - ANGLEUR	01.01.2002	30.12.2002	12
BE	As	BE0318A	0ATH01 - ATH	01.01.2002	30.12.2002	12
BE	As	BE0319A	0CHA06 - CHARLEROI	01.01.2002	30.12.2002	12
BE	As	BE0333A	00WZ01 - LOMMEL	01.01.2002	30.12.2002	12
BE	As	BE0366A	01MEU1 - MEUDON	01.01.2002	30.12.2002	12
BE	As	BE0373A	00R822 - ANTWERPEN	01.01.2002	30.12.2002	12
BE	As	BE0376A	00R801 - BORGERHOUT	01.01.2002	30.12.2002	12
BE	Cd	BE0242A	0ENG01 - ENGIS	01.01.2002	30.12.2002	12
BE	Cd	BE0252A	0LIE02 - LIEGE	01.01.2002	30.12.2002	12

BE	Cd	BE0275A	0OBG01 - OBOURG	01.01.2002	30.12.2002		12

COUNTRY	2-character ISO-code of country
COMP	identification component (shortname)
NMBR_STATIONS	number of stations for which results are resubmitted
STARTDATE	first date of resubmitted results
ENDDATE	last date of resubmitted results
NMBR_RECORDS	number of records resubmitted
STATIONNR	identification code station (external AIRBASE code used for reporting)
STATIONNAME	name of station

ANNEX G EXAMPLE REPORT DELETED META INFO WITH DATA

Overview deleted stations and measurement configurations with data

Stations with data (summary)

Overview deleted stations (EoI2003) for which data are stored in AIRBASE					
COUNTRY	NW_CODE	NW_NAME	SN_CODE	SN_EU_CODE	STATION_NAME
GR	256	ATHENS	2344	GR0004A	Drapetsona

Stations with data (details)

Overview meas_configurations of deleted stations (EoI2003) for which data are stored in AIRBASE												
COUNTRY	SN_EU_CODE	SN_CODE	STATION_NAME	COMP_ID	COMP_NAME	MC_CODE	AUTOMATIC	MONITOR	TECHNIQUE	RD_TYPE	DC_START DATE	DC_ENDDATE
GR	GR0004A	2344	Drapetsona	4	SPM	100	N	HVS	gravimetry	day	01.01.1984	31.12.1988
GR	GR0004A	2344	Drapetsona	6	BS	100	N	COLLECTOR	reflectometry	day	01.01.1984	31.12.1989

Overview deleted meas_configurations (EoI2003) for which data are stored in AIRBASE

COUNTRY	NW_CODE	NW_NAME	SN_CODE	SN_EU_CODE	STATION_NAME	COMP_ID	COMP_NAME	MC_CODE	AUTOMATIC	MONITOR	TECHNIQUE	RD_TYPE	DC_STARTDATE	DC_ENDDATE
GR	256	ATHENS	2371	GR0031A	NEA SMIRNI	10	CO	110	Y	Thermo Environmental Instruments 48	infrared absorption	day	01.07.1983	31.12.1995
GR	256	ATHENS	2371	GR0031A	NEA SMIRNI	10	CO	110	Y	Thermo Environmental Instruments 48	infrared absorption	hour	01.07.1983	31.12.1995
GR	256	ATHENS	2371	GR0031A	NEA SMIRNI	38	NO	120	Y	Thermo Env.	chemiluminescence	day	01.01.1987	31.12.1989
GR	256	ATHENS	2371	GR0031A	NEA SMIRNI	38	NO	120	Y	Thermo Env.	chemiluminescence	hour	01.01.1987	31.12.1989
GR	256	ATHENS	2372	GR0032A	PATISION	8	NO2	100	Y	TECO 14B	chemiluminescence	day	01.07.1983	31.12.1995
GR	256	ATHENS	2372	GR0032A	PATISION	8	NO2	100	Y	TECO 14B	chemiluminescence	hour	01.07.1983	31.12.2000
GR	256	ATHENS	2372	GR0032A	PATISION	10	CO	110	Y	Thermo Environmental Instruments 48	infrared absorption	day	01.07.1983	30.11.1984
GR	256	ATHENS	2372	GR0032A	PATISION	10	CO	110	Y	Thermo Environmental Instruments 48	infrared absorption	hour	01.07.1983	30.11.1984

ANNEX H EXAMPLE REPORT DELETED META INFORMATION WITHOUT DATA

Overview deleted stations and measurement configurations without data

Measurement configurations without data (summary)

Overview deleted meas_configurations (EoI2003) for which no data are stored in AIRBASE											
COUNTRY	NW_CODE	NW_NAME	SN_CODE	SN_EU_CODE	STATION_NAME	COMP_ID	COMP_NAME	MC_CODE	AUTOMATIC	MONITOR	TECHNIQUE
SI	1430	ANAS	5136	SI0002A	Maribor	7	O3	101	Y	THERMO ENVIRON MENTAL 49	ultraviolet absorption

ANNEX I EXAMPLE OUTLIER REPORT

Outliers (summary)

Quality Assurance / Quality Control 2003-data reported in 2004 for the Eoi				
Component(s) checked:				
			Checked on value	
Component	Avg.Time	Unit	Smaller than	Larger than
---------------------------------	--------	----------	------------	-----------
C6H6 (air)	hour	ug/m3	-10	50
CO (air)	hour	mg/m3	-10	20
NO2 (air)	day	ug/m3	-10	337,5
NO2 (air)	hour	ug/m3	-10	450
NOX (air)	hour	ug NO2/m3	-10	1500
O3 (air)	hour	ug/m3	-10	400
PM10 (aerosol)	hour	ug/m3	-10	700
SO2 (air)	day	ug/m3	-10	337,5
SO2 (air)	hour	ug/m3	-10	450
SO2 + SO4-- (air+aerosol)	day	ug S/m3	-10	150
NH3+NH4 (air+aerosol)	day	ug N/m3	-10	100
HNO3+NO3 (air+aerosol)	day	ug N/m3	-10	80
Results:				
-------	-----------------------------------	--------	------------------------	
Country	Component	Avg.Time	Status	
-------	-----------------------------------	--------	------------------------	
LT	C6H6 (air)	hour	OUTLIER(S) DETECTED	
LT	CO (air)	hour	OK	

LT	NO2 (air)	day	OK	
LT	NO2 (air)	hour	OK	
LT	NOX (air)	hour	OUTLIER(S) DETECTED	
LT	O3 (air)	hour	OK	
LT	PM10 (aerosol)	hour	OK	
LT	SO2 (air)	day	OK	
LT	SO2 (air)	hour	OK	
LT	SO2 + SO4-- (air+aerosol)	day	OK	
LT	NH3+NH4 (air+aerosol)	day	OK	
LT	HNO3+NO3 (air+aerosol)	day	OK	
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Outliers (detail)

Quality Assurance / Quality Control 2003-data reported in 2004 for the Eoi						
	------------------ ------------------		-------------------------			
-------	-	-------	-------------------------	----------------	------------	
		Station	Station			
Country	Component	EU code	Name	Day/Hour	Outlier	
	------------------ ------------------		-------------------------			
-------	-	-------	-------------------------	----------------	------------	
LT	C6H6 (air)	LT0046A	Klaipeda - Uostas	30-6-2003 16:00	80,80	
LT	NOX (air)	LT0039A	Vilnius - Zirmunai	22-2-2003 0:00	1591,00	
LT	NOX (air)	LT0039A	Vilnius - Zirmunai	28-3-2003 21:00	1509,00	

Description parameters:

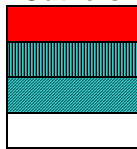| Component	identification of component (shortname)
Avg.Time	averaging time in which results are reported
Smaller than	minimum limit value
Larger than	Maximum limit value
Country	2-character ISO-code for country
Status	OK : no results found outside defined range
	OUTLIER(S) DETECTED: one or more results found outside defined range. Values are listed in sheet 'outliers (detail)'.
Station EU code	identification of station (external AIRBASE code used for reporting)
Station name	name of station
Day/Hour	day (format DAY-MONTH-YEAR) or
	hour (format DAY-MONTH-YEAR HOUR:00) outlier detected
Outlier	value of outlier

ANNEX J STATUS FEEDBACK REPORTS EoI2004

Status Country feedback EoI2004									

Country code	Country	Outliers				missing essential data	resubm. data	deleted meta with data stored	feedback sent
		wrong unit?	green	yellow	red				
AL	Albania								
AT	Austria								19-1-2005
BA	Bosnia-Herzegovina								19-1-2005
BE	Belgium								19-1-2005
BG	Bulgaria								19-1-2005
CH	Switzerland								19-1-2005
CS	Serbia and Montenegro								
CY	Cyprus								19-1-2005
CZ	Czech Republic								19-1-2005
DE	Germany								19-1-2005
DK	Denmark								19-1-2005
EE	Estonia								19-1-2005
ES	Spain								19-1-2005
FI	Finland								19-1-2005
FR	France								19-1-2005
GB	United Kingdom								19-1-2005
GR	Greece								19-1-2005
HR	Croatia								
HU	Hungary								19-1-2005
IE	Ireland								19-1-2005
IS	Iceland								19-1-2005

Status Country feedback EoI2004

Country code	Country	Outliers				missing essential data	resubm. data	deleted meta with data stored	feedback sent
		wrong unit?	green	yellow	red				
IT	Italy		▩	▩		▩			19-1-2005
LI	Liechtenstein								
LT	Lithuania		▩	▩				▩	19-1-2005
LU	Luxembourg								
LV	Latvia							▩	19-1-2005
MK	FYR of Macedonia		▩						19-1-2005
MT	Malta								19-1-2005
NL	Netherlands		▩		▩	▩			19-1-2005
NO	Norway		▩						19-1-2005
PL	Poland		▩					▩	19-1-2005
PT	Portugal			▩	▩	▩		▩	19-1-2005
RO	Romania		▩	▩	▩				19-1-2005
SE	Sweden		▩				▩	▩	19-1-2005
SI	Slovenia		▩						19-1-2005
SK	Slovak Republic		▩	▩					19-1-2005
TR	Turkey								

▩ detected in country-report

(orange dates) reply expected

ANNEX K STATUS REPLIES AND REACTIONS ON EOI2004 FEEDBACK REPORTS

Status Country	Country feedback	EoI2004 reply MS Outliers wrong unit?	green	yellow	red	missing essential data	resubm. data	deleted meta with data stored	reply received	reaction received
AL	Albania									
AT	Austria								21-2-2005	21-2-2005
BA	Bosnia-Herzegovina									
BE	Belgium								31-1-2005	31-1-2005
BG	Bulgaria								1-2-2005	1-2-2005
CH	Switzerland								3-3-2005	15-2-2005
CS	Serbia and Montenegro									
CY	Cyprus								4-3-2005	4-3-2005
CZ	Czech Republic								17-2-2005	17-2-2005
DE	Germany								3-3-2005	2-2-2005
DK	Denmark									
EE	Estonia									
ES	Spain								7-3-2005	7-3-2005
FI	Finland								2-2-2005	2-2-2005
FR	France								23-2-2005	8-2-2005
GB	United Kingdom								24-2-2005	24-2-2005
GR	Greece									
HR	Croatia									
HU	Hungary								15-2-2005	3-2-2005
IE	Ireland								23-2-2005	23-2-2005
IS	Iceland								16-2-2005	16-2-2005
IT	Italy								15-2-2005	15-2-2005
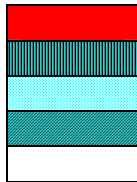
Code	Country								Date 1	Date 2
LI	Liechtenstein									
LT	Lithuania								9-2-2005	9-2-2005
LU	Luxembourg									
LV	Latvia								3-2-2005	3-2-2005
MK	FYR of Macedonia								3-3-2005	3-3-2005
MT	Malta									
NL	Netherlands								15-2-2005	15-2-2005
NO	Norway								14-2-2005	24-1-2005
PL	Poland								22-2-2005	22-2-2005
PT	Portugal								16-2-2005	16-2-2005
RO	Romania								17-2-2005	17-2-2005
SE	Sweden								21-1-2005	21-1-2005
SI	Slovenia								14-2-2005	14-2-2005
SK	Slovak Republic								23-2-2005	22-2-2005
TR	Turkey									
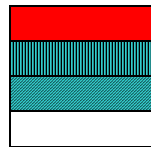
Outliers **(wrong unit):**
detect. in feedb-report, no reply yet
resubmitted/recalculated
no wrong unit
wrong unit but not yet resubmitted

Resubm. **data:**
detect. in feedb-report, no reply yet
restore resubmission
confirm

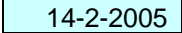**Outliers** **(green, yellow, red)**
detect. in feedb-report, no reply yet
resubmitted
some outlier/some not
no outlier
keep marked as outlier

Deleted **meta with data:**
detect. in feedb-report, no reply yet
confirm
confirm with doubts
keep meta data in AirBase

Missing   meta: **Reply received:**

detect. in feedb-report, no reply yet   no reply expected

resubmitted   reply expected

explanation missing fields | 14-2-2005 | reply received

not yet resubmitted

detect. in feedb-report, no reply at all

Actions:
- Outliers, wrong unit?: Replies BG, CY processed; CH results demarked, remain incorrect
- Outliers, green: Replies processed; no reply from GR: results demarked, supposed to be correct
- Outliers, yellow and red: Replies processed; no reply from HU, IE and LT: results remain marked, so they are not visible in AIRBASE
- Missing essential data: Replies processed; no reply from DE, DK, FR, UK, IE, IT and PT: results remain unchanged; these countries will be reminded in a next feedback round.
- Resubmitted data; no reply from AT, BE, CH and SE: results remain unchanged, so the new resubmitted data remain in AIRBASE and have overwritten the old data.
- Deleted meta data with data stored; no reply from GR, IE and IS: these meta data remain marked as 'to be deleted' and are not physically removed from AIRBASE; these countries will be reminded in a next feedback round.