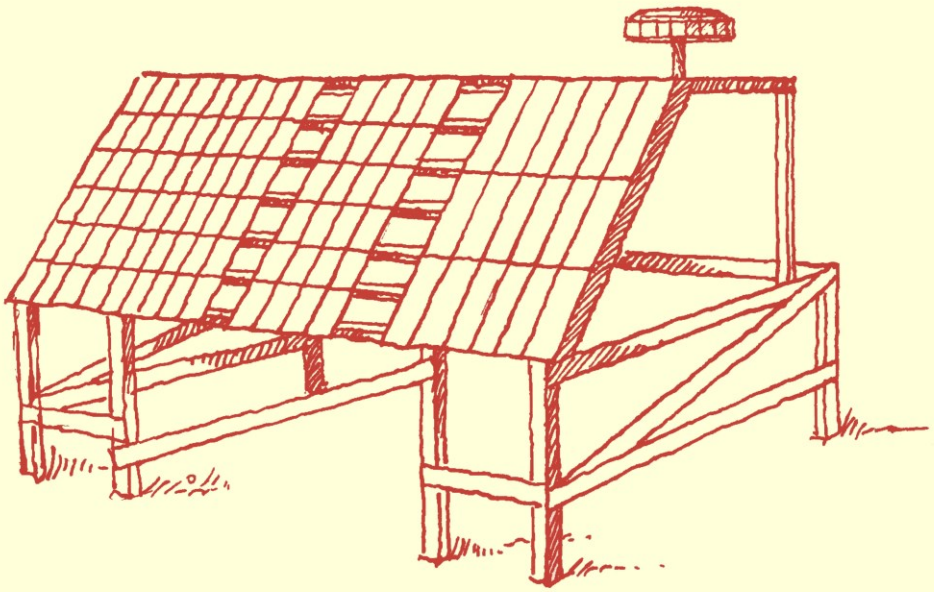
CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

UN/ECE INTERNATIONAL CO-OPERATIVE PROGRAMME ON EFFECTS ON MATERIALS, INCLUDING HISTORIC AND CULTURAL MONUMENTS



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ABSTRACT

This report presents the ICP Materials database for the period October 2014 - October 2015. It includes environmental data from the ICP Materials trend exposure programme for 2014 - 2015. The database consists of meteorological data (T and RH) and pollution data as gas concentrations, amounts of ions in precipitation, particle concentrations and amounts of particle deposition.

NORWEGIAN TITLE

Konvensjonen om langtransporterte luftforurensinger. UN/ECE internasjonale samarbeidsprogram for materialer og bygd kulturarv. Trendeksponeringsprogrammet 2014 – 2015. Miljødata-rapport. Oktober 2014 til oktober 2015.

KEYWORDS

Air quality | Environmental exposure | Material decomposition

ABSTRACT (in Norwegian)

Denne rapporten presenterer databasen i ICP Materialer for perioden oktober 2014 – oktober 2015. Den inkluderer miljødata fra ICP Materialer trend-eksponeringsprogrammet for 2014 – 2015. Databasen består av meteorologiske data (T og RF) og forurensningsdata som gasskonsentrasjoner, mengde ioner i nedbør, partikkelkonsentrasjoner og mengde avsatte partikler.

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International Co-operative Programme on Materials, including Historic and Cultural Monuments

Trend exposure programme 2014 – 2015

Environmental data report October 2014 to October 2015

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Contents

Summary

This report presents the environmental measurements for the UN/ECE ICP Materials trend exposure programme, 2014-2015. All the data collected from the participating test sites are reported here. Interpretation of the data related to effects on the corrosion of materials including cultural heritage, is presented in other ICP reports. The UN/ECE international co-operative programme on effects on materials is an international project that measures and assesses the corrosivity of the atmosphere. The corrosion of exposed sample materials and the air pollutants and climate are measured at stations mainly in Europe. Exposures have been ongoing in the programme since 1987, in different phases, with long time continuous exposures (1987-1995), exposures connected to EU framework projects (2002-2003), and since 2005 with annual trend exposures and measurements of the environment every third year, and also with some longer duration exposures of materials.

The most recent material samples of carbon steel, stainless steel, zinc, copper, limestone and modern glass, and environmental sampling started at all stations in October or November 2014. The samples were demounted in, respectively, September or October 2015, together with samples of carbon steel, weathering steel, zinc, aluminium and limestone that had been exposed for four years. One set of weathering steel samples was left to be exposed for three more years.

When the exposures started before 16th October 2014, the annual average values for the environmental parameters were calculated from and including October 2014. When the exposures started in the end of October 2014 (after 15th October 2014), the annual average values for the environmental parameters were calculated from and including November 2014.

Monthly (and tri-monthly) values and annual average values for the period are reported in Appendix A and B. Appendix A gives the monthly data reported directly from the ICP Materials test sites and the tri-monthly values for the same pollutant gases and for particle deposition measured with IVL passive samplers and analysed at IVL, The Swedish Environmental Institute, in Gothenburg, Sweden. Appendix B gives the annual average values for the data reported directly from the ICP Materials test sites, and for the same pollutant gases and for particle deposition measured with IVL passive samplers. Annex B also reports the start and end dates for the material exposures and the months included in the calculation of the annual averages for the environmental parameters. Appendix C and D give the original data from the IVL sampling. Appendix C gives the tri-monthly mean values for particle deposition on IVL samplers in a position sheltered from rain and for passive gas sampling of pollutant gases. Appendix D gives the annual average values for the particle deposition and pollutant gases measured in a position sheltered from rain for the exposure period. Appendix E gives the data availability in % for the sampling performed.

A good database for dose-response evaluation should have data with a wide range of values for the most important parameters. The 2014-2015 environmental data have a good spread in values for all important gases, as well as for the most important meteorological parameters.

Trend exposure programme 2014 – 2015

Environmental data report
October 2014 to October 2015

1 Introduction

Airborne acidifying pollutants are known to be one major cause for corrosion of different materials including the extensive damage that has been observed on historic and cultural monuments. In order to fill some important gaps of knowledge in this field, the Executive Body for the Convention on Long-range Transboundary Air Pollution decided to launch an International Co-operative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments, ICP Materials. The programme was launched in 1985. Measurements have been running since September 1987 and has involved exposure of materials at more than 30 test sites in Europe and North America.

Exposures were running for eight years at 39 test sites in 14 countries from 1987 to 1995 (Henriksen et al., 1997). A second phase of the project started in 1997 with an adjusted number of test sites, 30, and participating countries, 19 (Henriksen and Arnesen, 2003, Henriksen and Arnesen, 2000). During the interim period 1995 to 1997, trend analysis for metal corrosion and exposure of the glass and polymeric materials continued. In 2002-2003 the ICP Materials programme was combined with exposures in the EU project MULTI-ASSESS (EVK4-CT-2001-00044) (Henriksen et al. 2004). In 2005-2006, 2008-2009 and 2011-2012 annual trend exposures with analysis of corrosion of materials samples, including samples of carbon steel, weathering steel, stainless steel, zinc, copper, aluminium and Portland limestone, and analysis of soiling of glass samples, were carried out. In 2014-2015 new exposures were started with carbon steel, stainless steel, zinc, copper, limestone and modern glass.

For every period of the trend exposures, the environmental parameters are measured and reported. In 2005-2006, 22 stations in 13 European countries plus Canada participated. In 2008-2009, 24 stations in 14 European countries participated. In 2011-2012, 22 stations in 13 European countries participated. In 2014-2015, again, 24 stations in 14 European countries participated.

NILU - Norwegian Institute for Air Research has been the sub-centre responsible for the environmental data collection, storing, evaluation and reporting during the whole programme. This report includes the environmental data reported from the 2014-2015 trend exposures.

The aim of the trend exposures, from 2005, is to follow the development of corrosion trends over time in Europe in the present situation with a changing pollution and climate situation. The programme has changed focus during the time past. In 1987 the focus was on the impact of SO_2 and climate. Later the programme was enlarged to perform a quantitative evaluation of the effect of NO_x and other pollutants like ozone and sulphur in combination with climatic parameters, on the atmospheric corrosion of important materials. New

parameters like HNO_3 and particulate matter were introduced in the EU-project MULTI-ASSESS, and the study was expanded from corrosion to include soiling. In the new trend exposure programme from 2005, main indicator materials are exposed every third year and environmental parameters are collected.

The environmental data for the ICP Materials programme has been collected since September 1987. The environmental data from the three trend exposure periods from 2005 to 2012 are reported in Grøntoft et al. (2014, 2011, 2007).

The programme has been and is organised with Sweden as lead country and the Swedish Corrosion Institute (SCI), - from 2005 named "the Corrosion and Metals Research Institute" (KIMAB), is serving as the Main Research Centre. Sub-centres in different countries have been appointed, each responsible for the provision and analysis of one or more materials. The present materials Sub-centres are:

Structural metals:
- Steel and zinc (Sub-centre responsible for evaluation: SVUOM Praha a.s., Prague, Czech Republic)
- Weathering steel (CENIM, Madrid, Spain)
- Zinc (EMPA Corrosion/Surface Protection, Dübendorf, Switzerland)
- Copper and aluminium (KIMAB, Stockholm, Sweden)

Stone materials. Portland limestone (Building Research Establishment Ltd., Department of Environment, Waterford, United Kingdom).

Glass materials – **soiling.** Univerisite Paris XII (LISA)

NILU is, and has been through the whole programme, the sub-centre for the environmental database.

Other sub-centres through the history of the exposure programs, non-active in 2014-2015, are:

Paint coatings. Steel with silicon alkyd paint (Norwegian Institute for Air Research, Kjeller, Norway).

Glass materials. Two types of glass M1 and M3 (Institute of Chemistry, Academy of Fine Arts, Vienna, Austria)

Sub-centres for concrete and more stone materials, some of which are operational within the present trend exposure programme (see above), were active in the MULTI-ASSESS project 2002:

Stone and concrete materials:
- Standard Portland concrete, Latvian limestone (Riga Technical University, Riga, Latvia).

- Portland limestone, Carrara marble, Calcareous Baumberger sandstone (Building Research Establishment Ltd., Department of Environment, Waterford, United Kingdom).
- Gotland sandstone (Swedish Corrosion Institute, Stockholm, Sweden).

Soiling materials:

- Synthetic polymeric materials (Middelsex University, GB)
- Modern Glass (LISA – Universite Paris XII, Paris, France)

The range of materials that has been and can be exposed and related scientific partners/contacts is large.

Corrosion of carbon steel, zinc and Portland limestone and soiling of modern glass were measured in the trend exposures of 2005/6, 2008/9. In addition corrosion of weathering steel, copper and aluminium was measured in 2011/12, and stainless steel in 2014/15.

Simultaneously a range of environmental parameters was measured (Table 1 and Appendix A – B).

Extended environmental analyses. Passive HNO_3 and particle deposition measurements were introduced in the MULTI-ASSESS project (IVL Swedish Environmental Research, Gothenburg, Sweden), and were measured in the trend exposure programmes from 2005 to 2015. In 2011/12 also non-optional measurements of SO_2, HCOOH, CH_3COOH, HCl and HF gas and optional measurements of NH_3 gas were performed with IVL passive sampling method.

A complete list of participants and national contact centres participating in the 2014–2015 trend exposure programme is given in Appendix F.

2 The measuring programme

The measuring programme for the trend exposures in 2014-2015 is given in Table 1

Table 1: The environmental measurement programme for the ICP Materials trend exposures 2014 - 2015. "Standard parameters".

Components to be measured under topics			
Mandatory	Gases	:	SO_2, O_3, NO_2, HNO_3 (IVL)
	Precipitation	:	mm, pH, SO_4-S, NO_3-N, Cl^-
	Particulates	:	Particle deposition (IVL)
	Climate	:	Temperature, relative humidity
Optional	Precipitation	:	Conductivity, NH_4-N, Na^+, Ca^{2+}, Mg^{2+}, K^+
	Particulates	:	PM_{10}

The measurements were partly performed with locally available equipment and partly with passive samplers from IVL-Sweden (Ferm, 1999).

The data were reported to the environmental sub-centre as monthly mean values, except for mm precipitation, which was reported as the monthly sum. Tri-monthly mean data values from measurements with IVL passive methods were reported for HNO_3 gas concentrations and for particle deposition, for all sites, and for SO_2, NO_2 and O_3 gas concentrations where local monthly data where elsewise not available.

The data are presented as monthly and annual average values for the project period.

The quality control of the reported data is the responsibility of the countries and partners that report the data. The environmental sub-centre will control the data reported for outliers and create the joint database. It will also perform an evaluation of the data files and look for trends in the data set.

3 Data from the monitoring test sites

The data are sent to the environmental sub-centre as Excel data files by e-mail.

All data presented by the environmental sub-centre are given with the same accuracy as in the reporting forms agreed upon. For data series which include values "below the detection limit", these are, by convention, replaced with one half of the reported detection limits when calculating the mean values.

4 Monthly mean concentrations

The average monthly data reported for the test sites for the trend exposure, October 2014 to October 2015, are given in Appendix A. The calculated average annual data are given in Appendix B. The tri-monthly values for particles and gases measured with IVL samplers are

given with the monthly values in Appendix A. The calculated average annual values for particles and pollutant gases are given in Appendix B. The complete IVL data are given in Appendix C and D. The participating countries are reporting data on a monthly basis. The particle deposition, HNO_3, and additional sampling of the gases SO_2, NO_2 and O_3 is analysed and reported from IVL, Sweden.

5 Calculation of monthly values

For their own test sites the participants shall calculate the mean values in accordance with the following equations.

- Mean temperature (T_M)

$$T_M = \frac{\sum_1^i T_i}{i}$$

T_i = measured values

$$i = number\,of\ records \qquad (1)$$

- Mean relative humidity (RH_M)

$$RH_M = \frac{\sum_1^i RH_i}{i} \qquad (2)$$

- Mean gas concentrations G_M

$$G_M = \frac{\sum_1^i G_i}{i} \qquad (3)$$

For some sites where complete information of the sampling period exists, another equation is used for mean gas concentrations

$$G_M = \sum_1^i \frac{(n_i \cdot G_i)}{\sum_1^i n_i} \qquad (4)$$

$$n_i = sampling\,period$$

- Precipitation

$$mm = \sum_1^i mm_i \qquad (5)$$

The amount of precipitation is reported as the total amount for that month (in mm). This can be done without adjustment if the availability is 100%. If there are some missing data, however, this needs to be taken into account. To make an example, consider a case when sampling is made each day for a month consisting of 30 days and where data for two of the days are missing, making the availability 28/30 = 93%. If the total amount of precipitation for the 28 days is (say) 28 mm, corresponding to an average precipitation of 1 mm/day, this means that the expected total amount of precipitation for that month should be reported as [30 mm, D, 93%]. In this example it is of course important to distinguish between a day measured to have no rain (counted as 0 mm) and a day with missing data (counted as 1 mm).

- Weighted mean pH (pH_M)

$$pH_M = \div \log \frac{\sum_1^i \left[mm_i \cdot \left(10^{-pH_i} \right) \right]}{\sum_1^i mm_i} \qquad (6)$$

- Weighted mean values for cations, anions and conductivity (C_M)

$$C_M = \frac{\sum_{1}^{i} (mm_i \cdot C_i)}{\sum_{1}^{i} mm_i} \qquad (7)$$

6 Sites

For the trend exposures taking place from 2014, a selection of exposure sites was made. The list of test sites over time for the UN/ECE ICP Materials project is given in Table 2 (extended from SCI, 2005). The sites with a not yet finalised measuring period onwards from 1987 (no end year) were participating in the 2014/15 trend exposures.

Table 2: List of test sites of UN/ECE ICP Materials exposure programme. Stations participation since 1995.

Test site no.	Test site name	Country	Location	Measuring period
1	Prague	The Czech Republic	Urban	1987→
3	Kopisty	"	Industry	1987→
5	Ähtäri	Finland	Rural	1987→ 2003
7	Waldhof-Langenbrügge	Federal Republic of Germany	Rural	1987→ 2003
9	Langenfeld-Reusrath	"	Rural	1987→ 2003
10	Bottrop	"	Industry	1987→
13	Rome	Italy	Urban	1987→
14	Casaccia	"	Rural	1987→
15	Milan	"	Urban	1987→
16	Venice	"	Urban	1987→
21	Oslo	Norway	Urban	1987→
23	Birkenes	"	Rural	1987→
24	Stockholm South	Sweden	Urban	1987→
26	Aspvreten	"	Rural	1987→
27	Lincoln Cathedral	United Kingdom	Urban	1987→ 2003, 2008→ 2009
31	Madrid	Spain	Urban	1987→
33	Toledo	"	Rural	1987→
34	Moscow	Russia	Urban	1987→ 2003
35	Lahemaa	Estonia	Rural	1987→ 2009 2014→
36	Lisbon-Jeronimo Monastery	Portugal	Urban	1987→ 2003
37	Dorset	Canada	Rural	1987→ 2006
40	Paris	France	Urban	1997→
41	Berlin	Germany	Urban	1997→
43	Tel Aviv	Israel	Urban	1997→ 2001
44	Svanvik	Norway	Rural, industry	1997→
45	Chaumont	Switzerland	Rural	1997→
46	London	United Kingdom	Urban	1997→ 2003
47	Los Angeles	USA (CA)	Urban	1997→ 2003
49	Antwerp	Belgium	Urban	1997→ 2003
50	Katowice	Poland	Urban, industry	1999→
51	Athens	Greece	Urban,	2005→
52	Riga	Latvia	Urban,	2005→2012
53	Vienna	Austria	Urban,	2008→
54	Sofia	Bulgaria	Urban,	2008→2012
55	St. Petersburg	Russia	Urban	2011→2015
57	Hämeenlinna	Finland	Urban/rural	2014→
59	žilina	Slovakia	Urban	2014→

7 Regularity and quality of the reported data

The test sites represent areas from background level of pollutants to urban and industry levels. The background sites have historically had the best regularity for the data reported. Many of these sites belong to the EMEP monitoring programme and have long and good data records.

In urban and industrial areas it is generally more difficult to maintain sites. In programmes like ICP Materials with long exposure periods, it is sometime necessary to move a test site due to local problems like new use of the property. In some countries the funding of the environmental measurements was limited in periods. This is reflected in the selection of measurement stations for the trend exposures.

A brief review of the quality of the reported data for the different test sites are given in the following pages.

7.1 Review of reported data in the trend exposure programme, 2014 – 2015.

Optional data

The reporting of data for cations in precipitation and for particle concentration, PM_{10}, were optional in the programme. Full sets of monthly data for cations in precipitation are reported for sites 10, 21, 23, 31, 40, 44, 45 and 50. Full sets of monthly PM_{10} data are reported for sites 1, 3, 13, 14, 15, 10, 23, 24, 31, 33, 35, 44, 45, 50, 51, 53 and 59.

Non optional IVL data

IVL data for SO_2, NO_2 and O_3 are reported from a number of sites, mainly those that don't have local (non IVL) measurement results for these parameters from the stations – in which case they are non-optional.
The non-optional IVL data (HNO_3 and particulate matter deposition) are reported from all sites.

The IVL tri-monthly and annual average data for HNO_3 and particulate matter deposition, and for SO_2, NO_2, O_3, where these were measured, are reported with the other station-data in Appendix A and B.

A review of the reporting of the mandatory data from the single countries and stations is given below.

Sites 1 and 3 Czech Republic

Sites 1 and 3 have complete sets of data, except for one data point for pH in precipitation which is missing for November 2014 for station no. 3, explained by site manager as due to low precipitation.

Sites 10 and 41 Germany
Site 10 Bottrop has a near complete data set for the period. Only one data point for O_3 for February 2015 is missing. Site 41 report all data except for Cl^- in precipitation, which are missing for the whole period.

Sites 13, 14, 15 and 16 Italy
The Italian stations report nearly all data except the ions in precipitation. For stations 13, 15 and 16, pH and Cl^- are missing for the whole period. For station 14, Cl^- is missing for the whole period and pH in precipitation was not measurable in July 2015, due to low precipitation amounts. For station 16, Casaccia, the NO_2 concentration is missing for October and November 2014, and April, July and August 2015.

Sites 21, 23 and 44 Norway
The Norwegian stations report all the data, except for pH in precipitation for station 44, Svanvik, for November 2014. The T and RH data for station 23, Birkenes, for August 2015 were taken from the Kjevik meteorological station 170 km away from Birkenes. For stations 21 and 44 the O_3 data are IVL data. For station 23, O_3 data from IVL sampling are reported in addition to local (non IVL) O_3 data. From the summer 2012 the point for the environmental data acquisition at the Birkenes EMEP station was changed to a hilltop a few hundred meters away from the corrosion racks. An analysis of the data values from the old and new location showed systematic differences in values only for ozone (O_3), for which the values from October 2011 until June 2012 were 13 % higher at the new location than at the old location closer to the corrosion rack. The data acquired from the new location from July 2012 were therefore adjusted in the reporting for 2011-12 (Grøntoft and Ferm, 2014) by subtraction of 13.35% from the values from the new location. For the present (2014-15) period it is recommended to use the O_3 values measured at the location of the corrosion by IVL passive samplers.

Sites 24 and 26 Sweden
The Swedish stations report all the data, except pH and Cl^- in precipitation for April 2015 for station 24 and for January 2015 for station 26, which are missing. The results for O_3 from June and July from station 26 were reported as unreliable due to a lost inlet on the sampler, and were not included in the calculation of the annual mean value. SO_2, NO_2 and O_3 gas concentrations were reported both from local (non IVL) measurement and from measurements with IVL samplers. It is recommenced to use the values measured with the IVL passive samplers for corrosion analysis.

Sites 31 and 33 Spain
The Spanish stations report all the data.

Site 35 Estonia
The Estonian station reports all the data.

Site 40 France
All the data are available for Site 40, Paris. The SO_2, NO_2 and O_3 data are IVL data.

Site 45 Switzerland
All the data are available for Site 45, Chaumont. IVL data are reported for SO_2 and are reported, in addition to the local (non IVL) data, for NO_2 and O_3. It is recommended to use the local (non IVL) NO_2 and O_3 data in corrosion analysis.

Site 50 Poland
Site 50, Katowice, report all the data. The precipitation amount data are based on publically available precipitation-maps, with an uncertainty/isoline span of 10-20 mm, from the Institute of Meteorology and Water Management - National Research Institute of Poland. The average within the span was selected for the final reporting.

Site 51 Greece
Site 51, Athens, report all the data, except nearly all the ions in precipitation data. pH in precipitation is available only for from July to October 2015, but were not measurable in August and September 2015 due to low precipitation amounts.

Site 53 Austria
Site 53, Vienna, report all the data.

Site 55 Russia
Site 55, St. Petersburg, only report IVL data for SO_2, NO_2, HNO_3 and particle deposition for the three first months, December 2014 to February 2015.

Site 57 Finland
Site 57, Hämeenlinna, report all data. However, pH and Cl^- in precipitation are reported from Lammi, 35 km distance from the Hämeenlinna site. SO_2, NO_2 and O_3 gas concentrations were measured with IVL samplers.

Site 59 Slovakia
Site 59, Žilina, report all the data.

8 Data for regression analyses

8.1 The data base

For regression analyses the database for material damage for one year has to be correlated with the environmental database for the same period (Appendix B).

8.2 The data distribution

It is important for the evaluation of the dose-response correlation for the environmental impact on the materials that there is as large spread as possible in the concentrations of the most important pollution parameters. In the following figures the ranked distributions of the yearly mean values for the climate and pollution parameters, for the exposure year 2014-2015, are given. The diamonds represent values for measurements with the local (non IVL) station equipment, whereas the squares represent values from measurements with IVL passive samplers.

In Figure 1 the spread in the SO_2 concentrations for the year (2014-2015) is shown. The numbering of the sites is in accordance with Table 2.

The measured SO_2 values range from 13.4 µg/m^3 in Katowice (no. 50) down to 0.2 µg/m^3 for Birkenes (no. 23). The distribution is uneven with about half of the stations below 2 µg/m^3, then a step to six stations ranging from 2.3 µg/m^3 to 4.6 µg/m^3, and then to a further step with six stations ranging from 6.5 µg/m^3 to 13.4 µg/m3. The value for Katowice was the highest also in 2005-2006 (36.1 µg/m^3) and 2008-2009 (15.3 µg/m^3). The value for station 55, St. Petersburg, represents only three months of sampling from December 2014 to February 2015.

The distribution of the values for 2014-2015 was quite similar as for the period 2011-2012 (Grøntoft and Ferm, 2014), but with two higher values, Kopisty at 19.0 µg/m^3 and Katowice at 16.2 µg/m^3 in 2011-2012. The 2011-2012 values were slightly lower than for the period 2008–2009 indicating that the sulphur emissions affecting some locations in Europe are still being reduced.

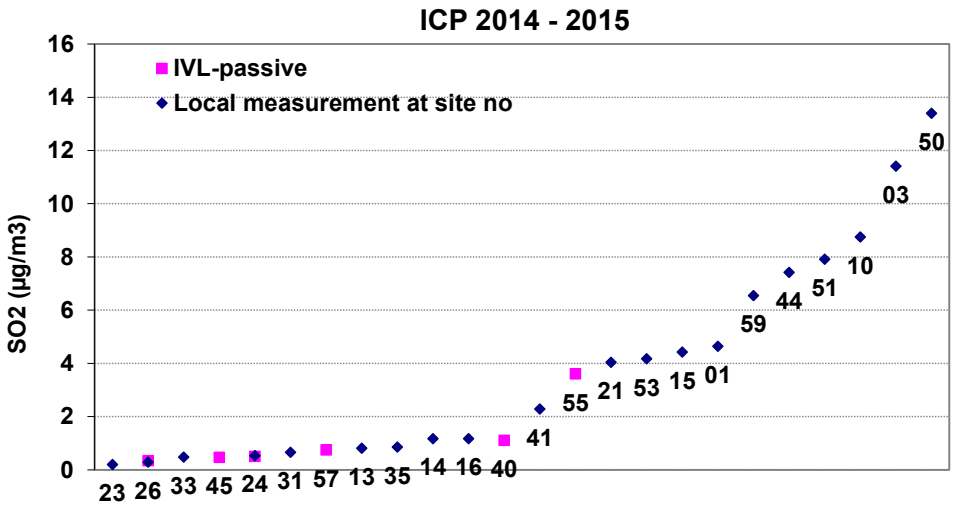

Figure 1: The spread in the yearly mean SO_2 concentrations at the test sites for the test period in ICP Materials.

In Figure 2 the spread in the NO_2 concentrations for the test period year is shown. The values range from 52.5 µg/m^3 for Athens down to 0.6 µg/m^3 for Birkenes. The distribution is fairly good, but with a clear step from station 24 Aspvreten, at 13.2 µg/m^3, for the locally administered measurement, to station 53, Vienna, at 13.2 µg/m^3. Measurements with IVL passive samplers gave considerably lower values than the locally administered measurement (LAM) at stations 24 (76 % of LAM) and 45 (39 % of LAM). However, for station 26, Stockholm, the locally administered measurement and the IVL sampling gave the same result. Several of the low values represent EMEP rural background sites.

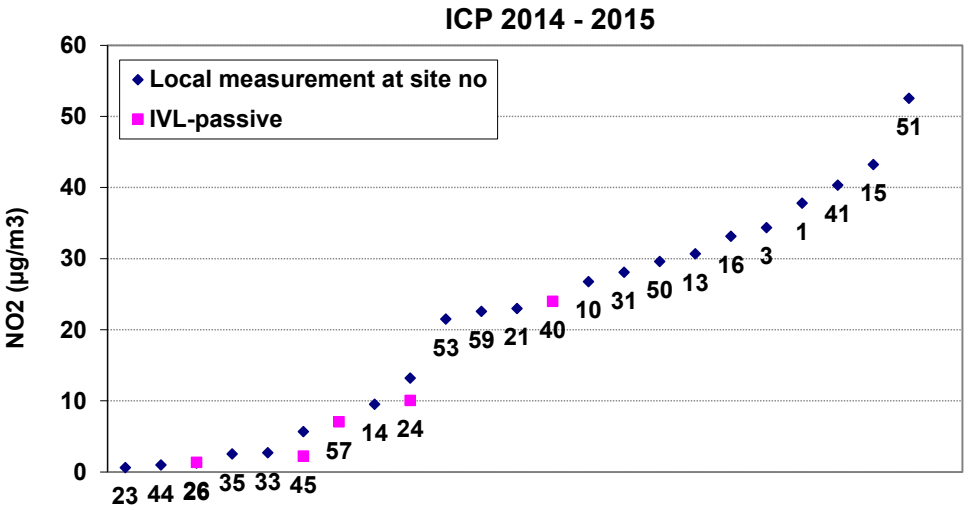

Figure 2: The spread in the yearly mean NO_2 concentrations at the test sites for the test period in ICP Materials.

In Figure 3 the spread in the O_3 concentrations for the test period is shown. The values range from 91.2 µg/m^3 in Toledo to 26.3 µg/m^3 for Athens. The Athens station is an urban traffic station where consumption of O_3 due to NO emission is expected. The value for station 55, St. Petersburg, represents only three months of sampling from December 2014 to February 2015.

The distribution is fairly good but slightly uneven between ~ 60 and 90 µg/m^3 with three stations (45, 14 and 33) with high values from 82.6 to 91.2 µg/m^3. High values at these three stations was also observed in 2011-12.

The low values are mostly observed in urban areas. The three highest values are in the south of Europe and close alpine area of Switzerland.

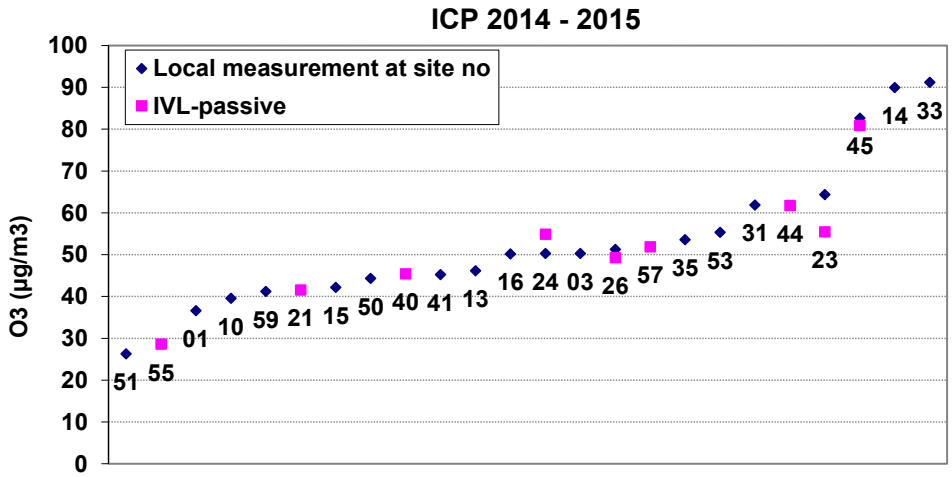

Figure 3: The spread in the measured yearly mean values for O_3 concentrations at the test sites for the test period in ICP Materials.

In Figure 4 the spread for HNO_3 concentrations, measured by IVL samplers, and in addition a separate local measurement at station no. 23, are shown. The figure shows yearly average values from tri-monthly sampling in a position sheltered from rain. The value for station 55, St. Petersburg, represents only three months of sampling from December 2014 to February 2015.

The values range from 1.4 µg/m^3 in Milan (no. 15) down to 0.06 µg/m^3 for Svanvik (no. 44). The spread is good and similar to the previous trend exposure periods (2005-2006, 2008-2009 and 2011-2012).

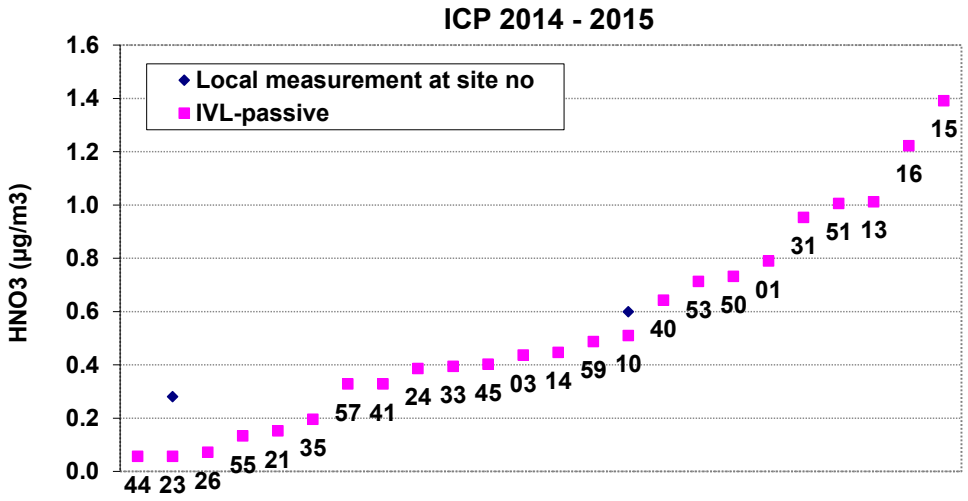

Figure 4: The spread in the measured yearly mean HNO_3 values for the test sites for the test period for ICP Materials.

In Figure 5 the spread for pH in the test period is shown. The pH values range from 7.4 for Athens, then 6.5 for Katowice (no. 50) and Madrid (no. 31), down to 4.48 in Prague. It was the first time a pH value for Athens was reported to ICP materials. The value for Athens represents 5 months of data from June to October 2015, but only three data points, as for July and August the precipitation amount was too low for pH measurement to be performed. The highest values are observed in cities in southern and central Europe, the low values at northern stations and one Czech station. The spread is good with reporting from more stations (19) than in the 2011-2012 period (12).

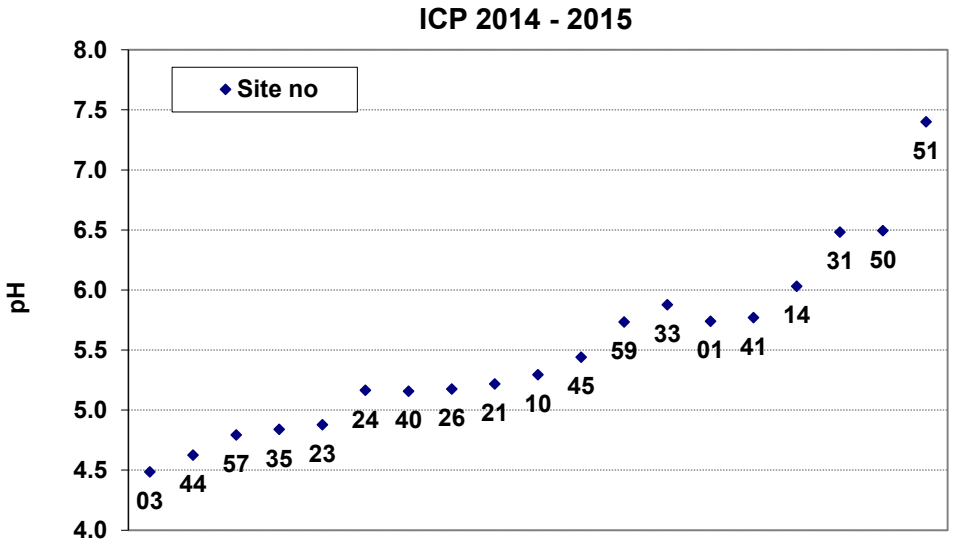

Figure 5: The spread in the measured yearly mean pH values at the test sites for the test period in ICP Materials.

In Figure 6 the spread for temperature in the test period is shown. The yearly average temperature ranges from 18.6˚C in Athens down to 1.5˚C for the Svanvik station. The temperature database covers the spread expected to be found over most of Europe.

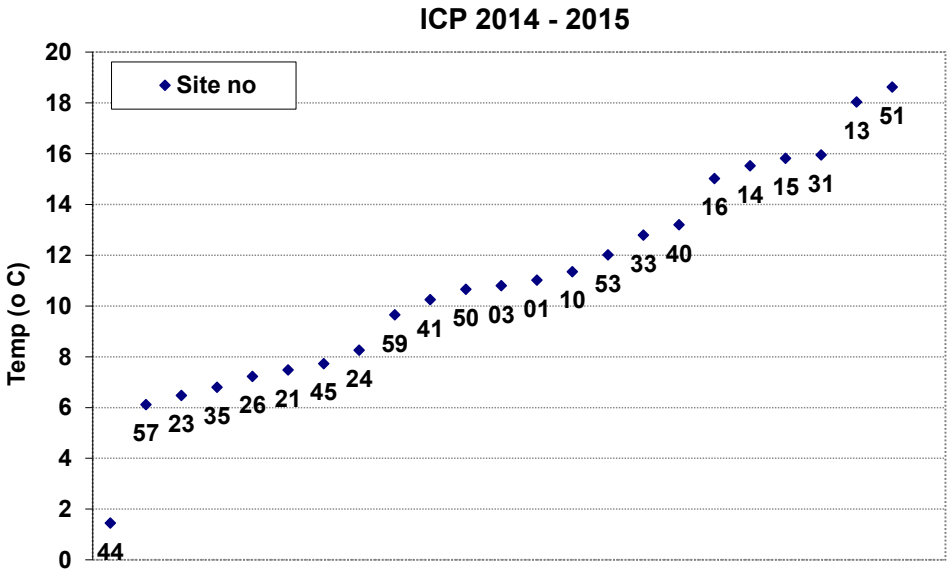

Figure 6: The spread in the measured yearly mean values for temperature at the test sites for the test period for ICP Materials.

In Figure 7 the spread for relative humidity in the test period is shown. The yearly average RH ranges from 83 % in Aspvreten down to 60 % for the Toledo station. The RH on the Madrid station was more than 20% higher in 2014-15 (63%) as compared to 2011-12 (42%).
The spread is quite good, and the RH database covers the spread expected to be found over Europe.

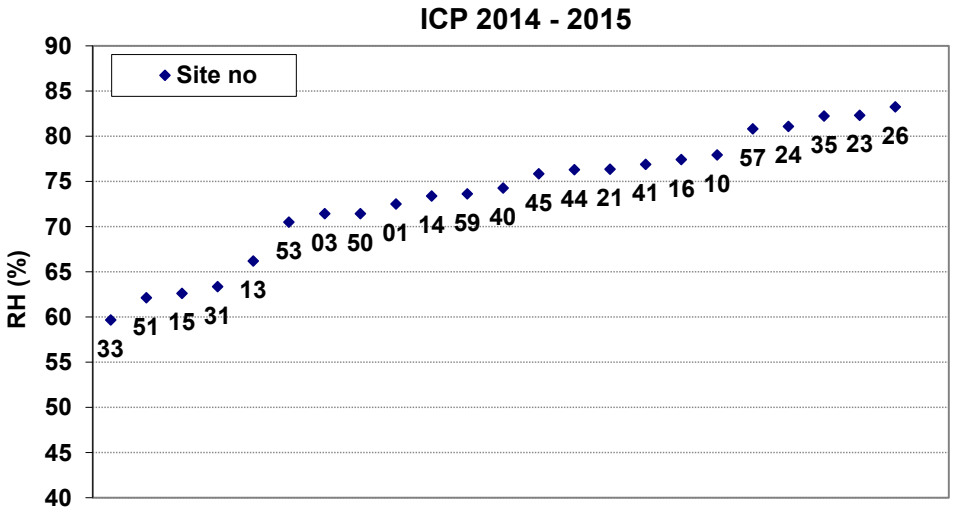

Figure 7: The spread in the measured yearly mean values for relative humidity at the test sites for the test period for ICP Materials.

In Figure 8 the spread for mm precipitation in the test period is shown. The spread is from 2194.5 mm at Birkenes (no. 23) down to 93 mm in Rome (no. 13). Birkenes had 42% more rain in 2014-15 than in 2011-12.The driest location in 2014-15, Rome, had less than half the amount of precipitation than the driest location in 2011-12 (Madrid).
The spread is good, but with considerably higher values for one station, Birkenes, and elsewise more even spread than in 2011-12. It is expected that stations on the European west coast can have considerably higher average yearly precipitation amounts, but this area is not well represented.

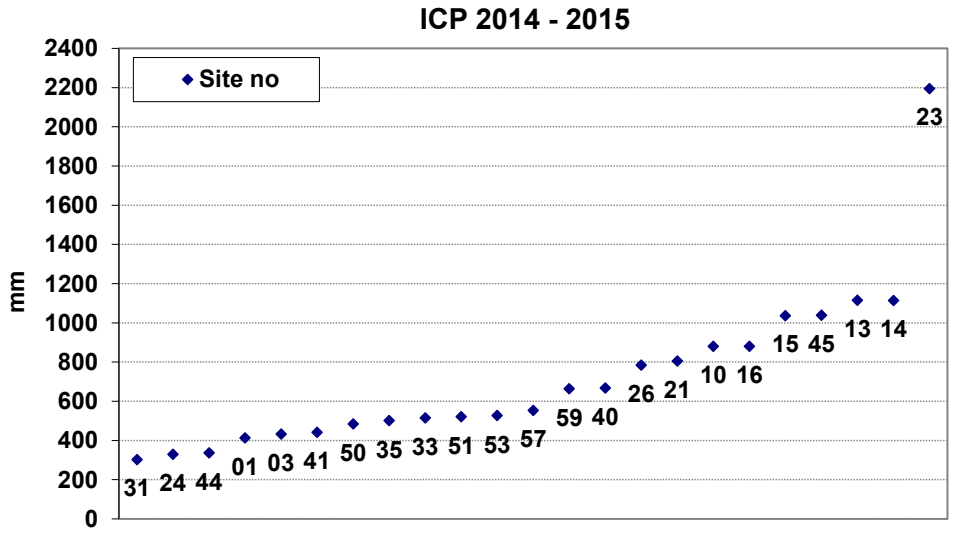

Figure 8: The spread in the measured yearly values for the total precipitation amount at the test sites for the test period for ICP Materials.

Figure 9 shows the spread in the amount of chloride (Cl-) in precipitation measured in the test period. The values range from 6.2 mg/l in Prague (no. 1) down to 0.16 mg/l in Chaumont (no. 45). The two Czech sites have much more chloride in the precipitation than the other sites. The spread is even from the low value of Chaumont up to the value of 2.2 mg/l for Birkenes, but then with only the two Czech sites to the high values.

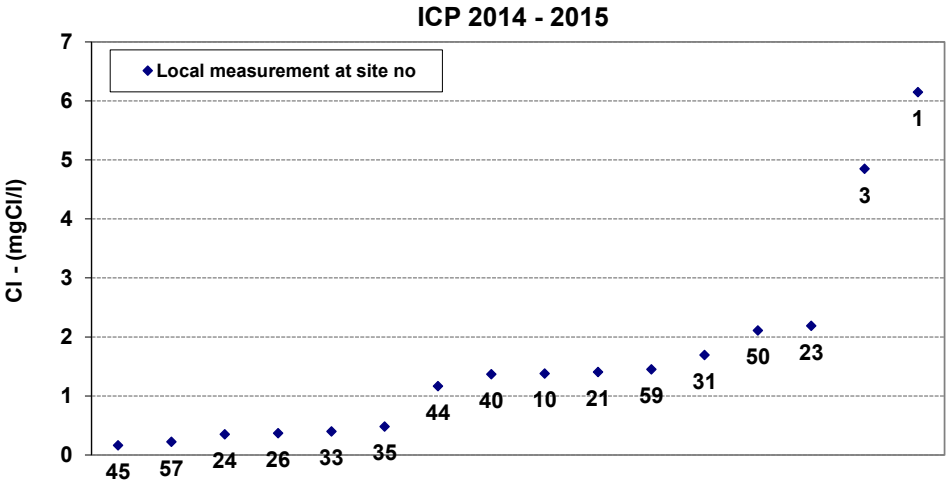

Figure 9: The spread in the measured yearly mean values for Cl^- in precipitation at the test sites for the test period for ICP Materials.

Figure 10 gives the yearly annual results from the measurements of particles. Values are shown for PM_{10} (µg/m^3) from local (non IVL) measurements at the stations and for yearly averages of particle deposition (µg/cm^2·month) from tri-monthly sampling by using IVL passive particle deposition samplers exposed in a situation shielded from rain. For the station in St. Petersburg (no. 55) the reported IVL data represent only three months from December 2014 to February 2015.

The PM_{10} values range from 41.6 µg/m^3 in Katowice (no. 50) to 3.9 µg/m^3 in Svanvik (no. 44). The particle deposition values range from 98 µg/cm^2 per month in Athens (no. 51) to 3.5 µg/cm^2 per month in Svanvik. The spread is good and even, except for two stations, Berlin (42 µg/cm^2 per month, as compared to 82 µg/cm^2 month in 2011-12) and Athens (98 µg/cm^2 per month, as compared to 24 µg/cm^2 per month in 2011-12).

The change for the deposition between the years is quite dramatic in both Berlin and Athens, but in opposite directions: decrease in Berlin and increase in Athens. However, in 2008-2009 a deposition of 94.3 µg/cm^2 per month) was measured in Athens, indicating that the low value for 2011-12 was an exception.

Except for Athens the range in the deposition is slightly lower than in 2011-2012.

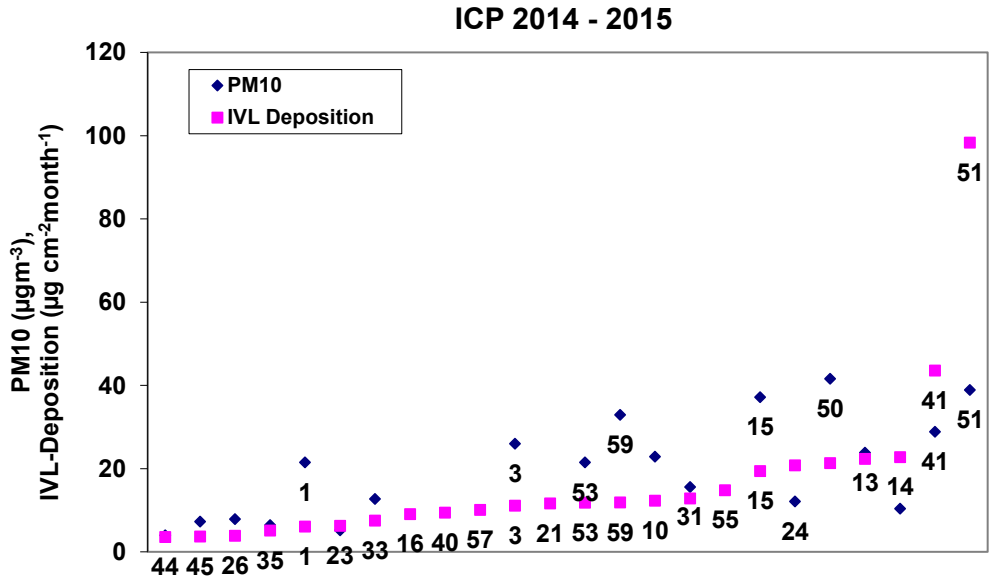

Figure 10: The spread in the measured yearly mean values for PM_{10}-concentration (blue diamonds) and particle deposition (red squares) and at the test sites for the test period for ICP Materials. PM_{10} measurements are optional and were not performed at all the stations.

Caution should be used in the interpretation of the optionally sampled PM_{10} data as the distance from the sampling station to the exposure site for the materials and other environmental measurements is unspecified. Some information about the locations for the PM_{10} measurements is available in Tidblad and Gordon (2012).

9 Conclusions

The database obtained during the trend exposure period 2014-2015 has comparable regularity and quality as for the previous years of the ICP Materials programme. Sites belonging to the national surveillance programmes and EMEP have the best regularity. Some of the urban sites have a lower regularity.

The irregularity is highest for the precipitation measurements, but was somewhat less in 2014-15 than in 2011-12. For the period 2014-15' all the stations reported precipitation amount. Precipitation quality (pH and Cl^-) was missing from seven of the stations in 2014-15 (as compared to ten stations in 2011-12).

Except for the precipitation quality data, the data coverage is good with annual average values available for all the station and parameters, and only few data points (monthly values) missing.

The spread in the data for the different environmental parameters is sufficient for statistical dose response analyses. The number of sites included in statistical treatment can be changed depending of the selection of parameters for the analyses.

10 References

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Appendix A

Monthly values for the test sites for the exposure period

Table A.1: Mandatory data including measurement with IVL samplers. The time for mounting and demounting of the IVL samplers are noted. Empty cells indicate that values are not available (n.a.) Measured zero values are reported as "0".

			Mandatory																
	Sampling		Climate											Precipitation			Particles		
	Period		Temp	IVL Temp	RH	SO2	IVL-passive SO2 (Tri- or four-monthly value put in for last month)	NO2	IVL-passive NO2 (Tri- or four-monthly value put in for last month)	O3	IVL-passive O3 (Tri- or four-monthly value put in for last month)	HNO3	IVL-passive HNO3 (Tri- or four-monthly value put in for last month)	Amount	H+	Cl-	IVL-passive sampler Particle depositon (Tri- or four-monthly value put in for last month)		
Site no	Year	Month	°C	°C	%	µg/m^3		µg/m^2	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	mm	pH	mgCl/l	µg/cm^{2}month	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
01	2014	10	11.4		88	7.5		37.0		13				65.2	5.1	7.4			
01	2014	11	7.0		90	7.8		37.7		8				18.5	5.7	4.8			
01	2014	12	3.1		83	7.8		44.9		21				28.8	6.5	1.2			
01	2015	1	1.8	5	83	2.7		40.7		25			0.34	25.8	6.5	11.7	7	04.10.2014 12:00	02.01.2015 12:00
01	2015	2	0.5		78	2.7		30.7		23				3.4	5.6	21.4			
01	2015	3	6.2		70	5.7		28.4		38				28.5	5.9	1.2			
01	2015	4	9.4	-1	64	5.7		57.3		47			0.50	25.8	5.9	2.1	5	02.01.2015 12:00	02.04.2015 12:00
01	2015	5	14.4		65	1.5		47.3		47				35.7	5.8	2.1			
01	2015	6	17.8	11	67	1.5		35.3		52			1.12	68.7	7.0	3.0	7	02.04.2015 12:00	30.06.2015 12:00
01	2015	7	22.3		56	3.9		36.6		66				24.2	7.8	5.1			
01	2015	8	23.6		58	3.9		23.0		64				63.6	7.0	16.8			
01	2015	9	14.8	17	68	4.9		34.7		36			1.16	25.5	5.9	0.1	6	30.06.2015 12:00	10.10.2015 12:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^{2}mont)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
03	2014	10	13.5		85	21.0		30.9		20				38.6	5.2	7.8			
03	2014	11	6.8		86	10.7		54.0		54				17.3		4.9			
03	2014	12	3.0		79	10.3		51.7		27				27.5	4.3	1.2			
03	2015	1	2.4	4	78	9.5		20.1		35			0.27	41.2	4.7	2.1	12	03.10.2014 12:00	06.01.2015 12:00
03	2015	2	0.8		74	12.0		25.1		35				4.8	4.0	33.9			
03	2015	3	5.4		69	8.5		19.0		44				49.0	3.7	1.4			
03	2015	4	9.5	-1	60	20.6		41.1		58			0.26	48.1	6.2	2.9	7	06.01.2015 12:00	07.04.2015 12:00
03	2015	5	14.0		61	11.3		45.4		58				20.6	5.8	3.4			
03	2015	6	16.9	13	67	9.7		36.1		67			0.64	65.0	8.9	8.6	13	07.04.2015 12:00	30.06.2015 12:00
03	2015	7	21.3		58	8.0		29.0		77				22.0	6.9	6.9			
03	2015	8	22.4		64	8.7		34.0		83				80.0	6.6	1.9			
03	2015	9	13.6	17	76	6.6		25.9		46			0.58	19.1	8.3	15.3	12	30.06.2015 12:00	09.10.2015 12:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
10	2014	1	6.0		85	11.0		32.0		25				42.4	5.7	1.5			
10	2014	2	7.3		77	17.0		29.0		35				42.6	5.7	2.1			
10	2014	3	9.1		71	11.0		35.0		34				9.2	6.1	2.0			
10	2014	4	12.9		73	<10		30.0		42				46.3	6.7	1.3			
10	2014	5	13.5		75	<10		22.0		49				96.7	5.8	0.9			
10	2014	6	17.0		71	<10		18.0		54				76.3	6.4	0.6			
10	2014	7	20.5		75	<10		21.0		57		1.0		110.9	5.8	0.4			
10	2014	8	16.8		79	11.0		24.0		41				140.1	4.9	0.7			
10	2014	9	16.1		83	<10		26.0		30				79.2	5.6	0.5			
10	2014	10	13.7		86	19.0		30.0		20		0.6		82.5	4.9	1.7			
10	2014	11	8.7		87	5.0		29.0		12				38.0	6.5	1.1			
10	2014	12	4.7		89	17.0		32.0		24				81.0	4.9	2.0			
10	2015	1	4.1	7	86	18.0		34.0		26			0.34	107.5	5.1	1.9	6	01.10.2014 09:45	07.01.2015 07:20
10	2015	2	3.4		85	11.0		33.0		--				43.7	5.9	3.0			
10	2015	3	6.7		78	5.0		31.0		35				72.1	5.0	2.0			
10	2015	4	10.2	4	68	5.0		24.0		50			0.31	33.3	6.7	2.1	11	07.01.2015 07:20	01.04.2015 07:30
10	2015	5	13.7		68	5.0		22.0		54				32.7	6.7	1.3			
10	2015	6	17.2	14	65	5.0		19.0		64			0.54	37.5	6.9	0.9	14	01.04.2015 07:30	24.06.2015 13:40
10	2015	7	19.9		70	5.0		20.0		61				104.4	6.5	0.8			
10	2015	8	19.9		73	5.0		24.0		56				163.3	5.9	0.4			
10	2015	9	14.1	10	81	5.0		23.0		33			0.78	84.1	5.2	1.1	7	24.06.2015 13:41	14.10.2015 07:35
10	2015	10	10.1		85	<10		28.0		14				54.6	4.7	0.6			
10	2015	11	10.0		83	13.0		27.0		28				119.2	6.0	1.9			
10	2015	12	10.1		80	21.0		30.0		25				62.5	6.1	1.3			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
13	2014	10	19.1		70	0.8		28.0		34				62.0					
13	2014	11	15.1		81	1.2		36.0		23				210.0					
13	2014	12	10.2		76	0.7		39.0		20				105.4					
13	2015	1	9.0	11	74	0.8		43.0		25			0.31	62.0			14	21.10.2014 11:10	28.01.2015 11:30
13	2015	2	9.5		72	0.8		38.0		34				82.8					
13	2015	3	12.4		68	0.7		34.0		48				151.9					
13	2015	4	15.6	11	63	0.9		28.0		59			0.38	106.5			20	28.01.2015 11:30	28.04.2015 11:00
13	2015	5	20.8		60	1.0		26.0		59				66.9					
13	2015	6	24.9		56	0.7		25.0		65				28.8					
13	2015	7	29.6	21	56	0.5		24.0		71			2.34	2.9			38	28.04.2015 11:00	28.07.2015 10:00
13	2015	8	27.7		56	0.5		22.0		64				88.6					
13	2015	9	23.4		59	1.3		23.0		53				87.2					
13	2015	10	18.3	21	74	0.6		30.0		33			1.08	122.1			17	28.07.2015 10:15	27.10.2015 12:00
13	2015	11	6.6		69	0.7		35.0		17				16.0					

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
14	2014	10	16.5		72	0.8		10.0		79				32.2	**5.4**				
14	2014	11	12.8		82	1.0		11.0		75				224.0	5.9				
14	2015	12	8.1		77	1.0		9.0		72				141.2	7.1				
14	2015	1	7.8	12	74	1.3		10.0		73			0.23	57.6	5.8		17	17.10.2014 11:00	16.01.2015 14:00
14	2015	2	7.6		79	1.2		9.0		82				122.9	6.4				
14	2015	3	10.1		76	1.1		9.0		91				187.7	6.1				
14	2015	4	12.8	9	72	1.3		10.0		105			0.23	57.4	5.9		17	16.01.2015 14:00	20.04.2015 11:00
14	2015	5	17.6		72	1.2		9.0		100				21.8	5.6				
14	2015	6	22.2		69	1.2		8.0		106				16.5	5.9				
14	2015	7	26.3	21	70	1.4		9.0		106			0.83	0.0			31	20.04.2015 11:00	23.07.2015 10:00
14	2015	8	24.6		69	1.2		9.0		105				70.9	5.8				
14	2015	9	20.4		65	1.3		10.0		89				52.8	5.9				
14	2015	10	16.0	20	78	0.8		11.0		75			0.50	161.3	6.1		25	23.07.2015 10:10	23.10.2015 11:00
14	2015	11	12.1		84	0.9		10.0		70				25.4	5.6				

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
15	2014	10	16.8		70	3.4		48.9		21				41.6					
15	2014	11	11.6		85	6.7		57.3		11				314.6					
15	2015	12	6.6		82	5.9		55.6		9				59.6					
15	2015	1	6.3	91	67	3.5		61.4		13			0.29	51.6			11	30.10.2014 10:45	29.01.2015 11:20
15	2015	2	6.2		69	3.0		61.9		16				111.2					
15	2015	3	11.3		56	3.1		49.2		38				32.2					
15	2015	4	15.4	90	49	1.8		34.3		61			0.70	65.6			23	29.01.2015 11:20	29.04.2015 11:00
15	2015	5	19.7		58	4.2		28.6		62				73.2					
15	2015	6	24.0		53	3.1		28.4		75				70.0					
15	2015	7	28.8	90	46	4.7		23.3		91			3.17	20.4			28	29.04.2015 11:00	28.07.2015 09:00
15	2015	8	25.3		56	3.5		29.4		67				70.4					
15	2015	9	20.1		56	6.4		37.9		44				90.4					
15	2015	10	14.5	98	75	7.1		51.1		18			1.42	78.0			17	28.07.2015 09:00	03.11.2015 10:30
15	2015	11	10.7		74	6.5		66.8		10				2.6					

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
16	2014	10	16.6		82	1.0				32				21.0					
16	2014	11	12.2		90	1.0				19				146.6					
16	2015	12	6.3		85	1.0		37.0		14				75.2					
16	2015	1	5.4	3	83	1.0		44.0		17			0.24	15.8			12	28.10.2014 11:15	23.01.2015 10:20
16	2015	2	6.4		78	1.0		29.0		38				46.8					
16	2015	3	10.0		75	1.0		43.0		52				85.8					
16	2015	4	13.5	8	73	1.0				66			0.62	37.8			10	23.01.2015 10:30	23.04.2015 09:40
16	2015	5	18.3		77	2.0		24.0		70				57.6					
16	2015	6	22.7		71	1.0		20.0		80				111.4					
16	2015	7	26.5	20	70	2.0				92			2.73	86.0			8	23.04.2015 09:50	28.07.2015 12:10
16	2015	8	24.6		73	1.0				72				86.6					
16	2015	9	19.9		73	1.0		26.0		56				21.2					
16	2015	10	14.5		81	1.0		42.0		26				110.2					
16	2015	11	9.3	18	84	1.0		57.0		14			1.18	10.0			6	28.07.2015 12:20	05.11.2015 11:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
21	2014	10	8.9		86	9.7		21.7						88.6	5.1	0.6			
21	2014	11	4.1		88	5.7		24.8						97.7	4.9	0.9			
21	2014	12	-2.2		90	3.9		37.0						21.6	5.6	8.3			
21	2015	1	-0.3	2	87	3.7		38.7			23.6		0.10	78.3	5.2	3.3	11	14.10.2014 13:30	14.01.2015 14:00
21	2015	2	0.3		83	3.9		31.4						31.1	5.4	6.5			
21	2015	3	3.5		74	3.9		22.1						55.9	6.0	1.5			
21	2015	4	7.1	1	56	2.4		15.0			39.6		0.11	21.5	5.9	1.6	15	14.01.2015 14:00	14.04.2015 14:00
21	2015	5	9.0		70	1.9		13.2						103.9	5.8	0.8			
21	2015	6	14.2		62	3.4		13.4						83.8	5.3	0.6			
21	2015	7	16.2	11	70	3.4		12.0			68.1		0.24	78.8	5.2	0.6	12	14.04.2015 14:00	14.07.2015 14:00
21	2015	8	16.5		71									6.9	5.4	0.6			
21	2015	9	12.5		79									136.9	5.2	0.3			
21	2015	10	7.3	16	80	3.3		34.7			35.2		0.17	0.4			9	14.07.2015 14:00	15.10.2015 14:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
23	2014	10	8.7		91	0.6		0.3		53		0.58		427.1	4.8	1.9			
23	2014	11	4.0		94	0.1		0.4		49		0.40		277.5	4.7	2.0			
23	2014	12	-0.9		93	0.7		0.2		62		0.22		99.0	4.8	5.7			
23	2015	1	0.1	4	93	0.3		0.3		65		0.18	0.04	259.1	4.8	5.0	2	22.10.2014 14:15	22.01.2015 07:00
23	2015	2	0.0		88	0.1		0.7		67		0.31		128.0	4.8	4.6			
23	2015	3	2.4		82	0.4		0.3		72		0.13		100.2	5.4	2.1			
23	2015	4	5.5	1	69	0.1		3.2		80		0.31	0.09	39.4	4.5	1.2	3	22.01.2015 07:00	22.04.2015 16:00
23	2015	5	7.5		77	0.1		0.3		75		0.22		155.7	5.2	1.0			
23	2015	6	12.1		68	0.1		0.2		67		0.31		97.5	5.3	1.8			
23	2015	7	14.3	11	74	0.1		0.3		63		0.45	0.02	165.1	5.0	0.2	13	22.04.2015 16:00	21.07.2015 06:00
23	2015	8	16.0		75	0.2		0.3		65		0.54		220.4	5.1	0.6			
23	2015	9	10.5		87	0.1		0.2		55		0.09		552.5	4.9	1.0			
23	2015	10	6.2	11	88	0.1		0.9		51		0.18	0.09	100.2	4.5	4.8	7	21.07.2015 07:00	21.10.2015 14:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
24	2008	10	8.4		83									43.4	*N.A.*	*N.A.*			
24	2008	11	3.2		86									29	*5.0*	*0.7*			
24	2008	12	1.4		89	0.8 (Y)		12 (Y)		51 (Y)				18.6	*4.6*	*0.4*			
24	2009	1	-1.1		84	Y=		Y=		Y=				9	*5.5*	*1.4*		The dates for the IVL exposures are only show n	
24	2009	2	-1.8		83	Yearly		Yearly		Yearly				5.2	*4.5*	*0.9*		for the latests trend period 2014-2015.	
24	2009	3	0.8		79	aver.		aver.		aver.				6	*6.0*	*0.6*			
24	2009	4	7.9		62									1.6	*7.4*	*1.3*			
24	2009	5	11.7		61									11.8	*6.1*	*0.9*			
24	2009	6	14.2		63									18.4	*5.6*	*0.1*			
24	2009	7	17.7		73									57.4	*5.9*	*0.3*			
24	2009	8	17.4		71									44.2	*6.4*	*0.3*			
24	2009	9	13.9		74									23.8	*6.7*	*0.6*			
24	2009	10	5.6		82									35.6	*7.5*	*0.6*			
24	2009	11	5.4		88									22.4	*5.9*	*0.7*			
24	2009	12	-1.3		88	1 (Y)		13 (Y)		47 (Y)				5.6	*4.8*	*1.5*			
24	2010	1	-6.9		85									3.8	*4.6*	*0.9*			
24	2010	2	-5.4		88									1.4	*4.4*	*0.8*			
24	2010	3	-0.3		76									4.4	*4.8*	*0.7*			
24	2010	4	5.8		70									6.8					
24	2010	5	10.9		67									18.4					
24	2010	6	15.2		63									28.2					
24	2010	7	20.7		64									48.4	*Italics means*				
24	2010	8	17.1		80									70	*that data from a*				
24	2010	9	12.0		81									51.4	*nearby station*				
24	2010	10	6.4		79									14.4	*"Kaanan"*				
24	2010	11	0.4		86									23.6					
24	2010	12	-6.6		89	1.2 (Y)		15 (Y)		49 (Y)				6.2					

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
24	2011	1	-2.0		87									8.8	*5.1*	*1.3*			
24	2011	2	-4.3		79									7.4	*4.9*	*1.0*			
24	2011	3	1.0		67									2.2	*5.6*	*2.4*			
24	2011	4	8.6		65									4.4	*6.4*	*0.4*			
24	2011	5	11.3		65									23	*5.6*	*0.5*			
24	2011	6	17.0		67									34.2	*5.1*	*0.3*			
24	2011	7	19.0		74									4.8	*5.0*	*0.6*			
24	2011	8	17.1		77									52.2	*6.3*	*0.2*			
24	2011	9	14.0		79									41.2	*6.3*	*0.3*			
24	2011	10	8.5		83									26.6					
24	2011	11	5.9		88									4.8	*5.9*	*2.4*			
24	2011	12	2.4		86	0.8		10.0		55				41.6	*6.0*	*0.8*			
24	2012	1	-0.9		85	1.2		16.1		37				21.2	*5.2*	*0.9*			
24	2012	2	-3.0		80	2.1		17.6		45				18.8	*5.3*	*0.5*			
24	2012	3	4.3		69	0.4		12.2		60				11.6	*5.7*	*0.9*			
24	2012	4	4.5		72	0.6		10.1		68				36	*5.7*	*0.2*			
24	2012	5	11.7		58	0.7		9.3		72				7.4	*6.5*	*0.5*			
24	2012	6	13.4		74	0.7		8.6		57				96.8	*5.2*	*0.2*			
24	2012	7	17.6		72	0.5		6.6		56				44.8	*5.7*	*0.2*			
24	2012	8	16.7		78	0.5		9.0		46				85	*5.9*	*0.2*			
24	2012	9	12.2		81	0.4		7.6		42				33.6	*6.6*	*0.3*			
24	2012	10	6.9		85	0.5		14.0		32				41.8	*5.1*	*0.4*			
24	2012	11	4.5		89	0.8		12.3		38				26.2	*4.7*	*0.5*			
24	2012	12	-3.1		91	2.2		19.2		32				6	*4.6*	*0.7*			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
24	2013	1	-3.4		90	1.0		19.8		39				6	*4.6*	*0.6*			
24	2013	2	-1.4		90	0.9		17.7		44				1.8	*4.7*	*1.1*			
24	2013	3	-2.5		63	0.8		16.9		67				0.4	*6.1*	*3.9*			
24	2013	4	4.6		68	0.5		10.7		73				11	*6.2*	*0.9*			
24	2013	5	12.5		73	0.9		10.7		66				11.2	*5.9*	*0.5*			
24	2013	6	16.2		74	0.5		8.5		58				34.8	*7.1*	*0.4*			
24	2013	7	18.0		67	0.4		8.8		52				31	*7.1*	*0.4*			
24	2013	8	17.6		72	0.5		12.6		51				36					
24	2013	9	12.9		80	0.6		17.6		43				23	*5.4*	*0.2*			
24	2013	10	8.8		86	0.6		14.0		39				31.9	*4.9*	*0.4*			
24	2013	11	4.3		89	0.5		14.5		38				25.1	*4.8*	*0.4*			
24	2013	12	3.3		89	0.7		12.5		45				17.9	*5.2*	*0.9*			
24	2014	1	-1.6		86	1.9		13.5		47				11.2	*4.7*	*0.9*			
24	2014	2	2.1		95	1.5		13.9		41				14.6	*6.1*	*1.4*			
24	2014	3	4.2		74	0.6		14.6		59				17.1	*5.4*	*0.6*			
24	2014	4	7.0		64	0.8		13.4		67				6.7					
24	2014	5	10.7		72	0.7		10.7		61				15.4					
24	2014	6	13.9		70	0.7		8.8		54				16.7					
24	2014	7	20.5		70	1.0		10.0		61				22.4					
24	2014	8	17.4		78	0.5		8.0		58				50.7					
24	2014	9	13.5		84	1.0		12.5		44				46.7					
24	2014	10	9.4		90	0.9		12.7		36				52.4					
24	2014	11	5.4		93	0.8		14.7		34				9.5	6.5	2.1			
24	2014	12	0.4		94	0.9		14.7		39				20.1	4.7	1.0			
24	2015	1	0.8		92	0.9		12.3		46				20.9	4.8	0.7			
24	2015	2	1.2	-1	90	0.5	0.8	13.5	13.4	47	44.1		0.28	9.5	4.9	0.6	11	22.10.2014 12:00	02.02.2015 12:00
24	2015	3	3.6		81	0.6		17.3		55				29.1	5.6	0.3			
24	2015	4	6.9		66	0.3		12.2		66				3.2					
24	2015	5	9.8	0	75	0.3	0.4	9.8	8.7	61	64.3		0.27	70.9	5.4	0.2	34	02.02.2015 12:00	20.05.2015 12:00
24	2015	6	14.3		70	0.4		9.2		60				29.3	5.6	0.2			
24	2015	7	16.8		77	0.4		9.0		53				59.1	5.6	0.2			
24	2015	8	17.9	17	73	0.4	0.3	10.9	4.3	58	134.1		0.69	9.9	5.6	0.2	19	20.05.2015 12:00	11.08.2015 12:00
24	2015	9	13.6		86	0.5		13.9		45				67.6	5.0	0.2			
24	2015	10	8.5	12	76	0.4	0.4	20.5	13.7	37	56.3		0.37	0.6	5.4	0.3	17	11.08.2015 12:00	21.10.2015 12:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
26	2008	10	7.5		89									*48*	*4.8*	*1.09*	*Italics (pH, Cl): data*		
26	2008	11	2.6		90									*50*	*4.7*	*0.63*			
26	2008	12	1.0		93									*53*	*4.4*	*0.51*	*from nearby*	The dates for the IVL exposures are only show n	
26	2009	1	-1.5		87									*28*	*4.4*	*0.96*	*station*	for the latests trend period 2014-2015.	
26	2009	2	-2.1		86									13	3.8	0.65			
26	2009	3	0.7		84									43	4.5	0.43			
26	2009	4	6.2		76									5	6.3	0.46			
26	2009	5	10.6		73									44	5.6	0.38			
26	2009	6	13.5		71									45	5	0.21			
26	2009	7	17.7		78									53	4.8	0.19			
26	2009	8	16.7		77									37	6.2	0.16			
26	2009	9	12.5		81									33	6.2	0.54			
26	2009	10	4.6		87									60	4.7	0.76			
26	2009	11	5.0		91									53	4.5	0.76			
26	2009	12	-2.3		92	0.4 (Y)		2.1 (Y)		54 (Y)									
26	2010	1	-7.5		86	Y=		Y=		Y=				53	4.5	0.78			
26	2010	2	-5.8		90	Yearly		Yearly		Yearly				42	4.4	0.78			
26	2010	3	-0.8		77	aver.		aver.		aver.				13	5.1	0.33			
26	2010	4	4.4		79									32	5.1	0.23			
26	2010	5	9.9		76									51	5	0.08			
26	2010	6	14.6		71									35	5.5	0.16			
26	2010	7	19.5		73									53	5.1	0.15			
26	2010	8	16.2		87									53	5.9	0.16			
26	2010	9	11.3		86									53	5.1	0.42			
26	2010	10	5.2		86									56	4.6	0.77			
26	2010	11	-0.3		92									53	4.7	0.48			
26	2010	12	-7.6		90	0.5 (Y)		2.6 (Y)		55 (Y)				53	4.3	0.51			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
26	2011	1	-3.1		90									34	4.5	0.34			
26	2011	2	-4.9		83									35	4.6	0.6			
26	2011	3	0.5		73									11	5.1	0.68			
26	2011	4	7.3		74									28	6	0.34			
26	2011	5	10.1		73									44	5.1	0.41			
26	2011	6	15.8		75									53	5.1	0.18			
26	2011	7	18.4		81									53	5	0.12			
26	2011	8	15.9		86									53	5.7	0.34			
26	2011	9	12.6		87									53	5.8	0.66			
26	2011	10	7.2		91									55	5	0.61			
26	2011	11	4.7		95									8	5	1.11			
26	2011	12	1.7		93	0.4		1.9		57				53	4.9	1.34			
26	2012	1	-1.5		91	0.4		2.8		47				51.5	4.9	0.86			
26	2012	2	-4.8		88	0.8		3.8		55				41.3	4.7	0.49			
26	2012	3	3.6		73	0.3		1.7		65				12.9	5.1	0.48			
26	2012	4	3.6		82	0.4		1.7		71				53.1	4.9	0.37			
26	2012	5	10.3		74	0.5		1.5		72				27.3	5.3	0.24			
26	2012	6	12.6		82	0.3		1.1		58				53.1	5	0.29			
26	2012	7	16.5		82	0.4		1.2		55				34.4	4.8	0.35			
26	2012	8	15.4		86	0.4		1.1		47				46.2	5.2	0.32			
26	2012	9	11.4		89	0.3		1.3		44				75	4.9	0.35			
26	2012	10	5.7		92	0.2		1.7		36				53.1	4.9	0.44			
26	2012	11	3.8		96	0.4		2.1		40			Sampler malfunctioning						
26	2012	12	-4.0		97	0.6		4.0		46									

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
26	2013	1	-4.1		96	0.3		3.6											
26	2013	2	-2.4		94	0.2		2.8		53									
26	2013	3	-3.8		74	0.4		1.7		74									
26	2013	4	3.1		76	0.4		1.6											
26	2013	5	11.1		78	0.5		1.8		69									
26	2013	6	15.0		79	0.5		1.1		60				New sampler					
26	2013	7	17.2		71	0.4		0.8		51				17	5.0	0.14			
26	2013	8	15.9		79	0.3		0.8		48				94	5.1	0.21			
26	2013	9	11.3		84	0.5		0.8		40				30	5.0	0.51			
26	2013	10	7.9		88	0.4		1.7		42				80.4	4.7	0.52			
26	2013	11	3.2		90	0.2		1.6		38				197	4.8	0.40			
26	2013	12	2.5		93	0.3		2.8		46				96.5	4.6	0.87			
26	2014	1	-1.6		88	0.9		2.6		54				50	4.6	0.94			
26	2014	2	1.5		97	1.5		2.9		44				76	4.5	1.38			
26	2014	3	3.1		77	0.5		1.8		59				44	4.7	0.59			
26	2014	4	5.4		70	0.4		1.5		66				44	5.1	0.33			
26	2014	5	9.3		73	0.3		1.2		63				46	5.0	0.21			
26	2014	6	13.0		72	0.2		1.0		54				45	5.1	0.18			
26	2014	7	19.0		70	0.6		1.3		66				14	5.5	0.25			
26	2014	8	15.9		80	0.5		1.0		55				85	5.8	0.30			
26	2014	9	11.7		83	0.6		1.1		43				86	5.0	0.19			
26	2014	10	8.9		90	0.5		1.5		41				96.0	4.8	0.9			
26	2014	11	4.7		90	0.2		1.4		40				40.0	5.0	1.0			
26	2014	12	0.0		95	0.4		1.4		44				50.0	5.0	1.0			
26	2015	1	0.4		91	0.4		1.7		51				110.0					
26	2015	2	0.6	-1	93	0.3	0.5	2.5	1.9	54	43.8		0.10	31.0	4.7	1.1	2	22.10.2014 12:00	03.02.2015 12:00
26	2015	3	2.5		80	0.3		2.1		60				62.0	5.1	0.6			
26	2015	4	6.1		71	0.2		0.9		66				11.8	6.3	0.4			
26	2015	5	8.4	0	76	0.2	0.3	0.8	1.7	60	58.1		0.08	100.0	5.2	0.4	4	03.02.2015 12:00	20.05.2015 12:00
26	2015	6	13.3		70	0.2		0.7						100.4	5.3	0.1			
26	2015	7	15.5		78	0.2		0.7						105.6	5.3	0.3			
26	2015	8	15.9	17	78	0.4	0.3	0.7	0.8	53	52.3		0.06	69.6	5.9	0.2	6	20.05.2015 12:00	13.08.2015 12:00
26	2015	9	12.2		85	0.3		0.8		45				100.0	5.2	0.3			
26	2015	10	7.0	12	82	0.2	0.2	1.3	1.0	41	40.3		0.04	3.8	6.2	1.1	3	13.08.2015 12:00	21.10.2015 12:00
26	2015	11	4.1		91	0.1		1.7		38				90.0	5.3	0.7			
26	2015	12	3.3		82	0.2		1.4		52				23.6	5.1	1.0			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
31	2014	10	18.7		73	0.7		30.0		43									
31	2014	11	11.7		90	0.8		25.0		43				27.9	6.8	1.1			
31	2014	12	7.6		78	0.7		44.0		28				32.4	6.3	0.4			
31	2015	1	6.2	7	73	0.7		50.0		31			0.45	21.1	6.2	1.3	6	20.10.2014 12:00	27.01.2015 12:00
31	2015	2	6.1		75	0.6		25.0		59				15.7	6.3	2.4			
31	2015	3	11.2		63	0.6		32.0		59				28.6	7.7	2.2			
31	2015	4	13.8		64	0.7		22.0		76				36.8	6.5	1.1			
31	2015	5	19.0	10	52	0.6		24.0		79			0.67	1.4	6.4	3.0	18	27.01.2015 12:00	07.05.2015 12:00
31	2015	6	23.3		47	0.6		26.0		94				27.1	6.6	2.5			
31	2015	7	28.6	21	37	0.6		23.0		90			1.83	1.7	6.7	3.7	19	07.05.2015 12:00	29.07.2015 12:00
31	2015	8	25.5		47	0.6		13.0		77				27.0	6.8	0.8			
31	2015	9	21.6		55	0.6		23.0		66				9.2	6.7	5.2			
31	2015	10	16.9	20	79	0.7		30.0		40			1.01	73.8	6.4	2.1	8	29.07.2015 12:00	28.10.2015 12:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
33	2014	10	15.1		68	0.8		2.3		68				77.5	5.5	0.4			
33	2014	11	7.6		85	0.7		1.7		63				148.7	6.0	0.5			
33	2014	12	4.5		76	0.6		3.1		61				22.4	6.2	0.4			
33	2015	1	5.1	8	64	0.6		3.1		88			0.23	32.6	5.7	0.2	3	21.10.2014 12:00	28.01.2015 12:00
33	2015	2	2.8		74	0.5		2.5		71				32.3	5.7	0.2			
33	2015	3	8.3		63	0.6		3.7		81				69.1	6.5	0.4			
33	2015	4	10.6	11	64	0.4		2.4		98			0.25	39.8	5.9	0.4	12	28.01.2015 12:00	08.05.2015 12:00
33	2015	5	16.5		47	0.5		2.3		107				8.3	6.1	0.4			
33	2015	6	20.4		44	0.6		2.9		123				34.8	5.9	0.2			
33	2015	7	26.1	22	31	0.4		2.3		117			0.69	2.2	6.4	0.7	7	08.05.2015 12:00	29.07.2015 12:00
33	2015	8	22.3		42	0.4		2.5		104				14.7	6.3	0.5			
33	2015	9	17.1		51	0.3		2.9		102				39.0	5.7	0.4			
33	2015	10	12.3	21	75	0.3		3.0		79			0.47	71.9	5.7	0.4	9	29.07.2015 12:00	28.10.2015 12:00

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
35	2014	10	5.8		83	1.3		2.7		41				26.1	4.8	0.5			
35	2014	11	1.5		94	1.3		4.3		30				32.3	4.6	0.2			
35	2014	12	-1.0		93	0.8		3.1		49				54.4	4.7	0.4			
35	2014	1	-1.6	5	91	0.9		2.9		53			0.20	61.0	4.8	0.8	1	29.10.2014 12:00	15.01.2015 12:00
35	2015	2	-0.2		87	0.9		4.1		57				21.6	4.5	0.8			
35	2015	3	2.1	6	77	1.4		3.4		64			0.35	21.8	5.1	0.5	4	15.01.2015 12:00	18.03.2015 16:00
35	2015	4	5.2		76	1.2		3.0		70				26.8	4.9	0.2			
35	2015	5	10.2		72	0.7		1.8		70				28.1	5.3	0.3			
35	2015	6	14.1		72	0.5		1.5		62				59.5	5.0	0.8			
35	2015	7	16.3	11	78	1.0		1.4		53			0.18	98.6	5.0	0.4	5	18.03.2015 16:00	07.07.2015 16:30
35	2015	8	16.7		76	0.5		1.1		51				28.9	5.2	0.9			
35	2015	9	12.9		86	0.7		1.4		43				57.0	4.7	0.2			
35	2015	10	5.4	12	83	0.4		2.0		41			0.13	11.5	5.0	0.6	8	07.07.2015 16:30	28.10.2015 11:15
35	2015	11	4.2		93	0.4		2.7		40				58.3	5.1	0.5			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
40	2014	10	15.1		84									23.5	5.6	2.4			
40	2014	11	9.9		88									63.8	4.7	2.0			
40	2014	12	5.7		87									63.8	4.7	2.0			
40	2015	1	4.9	10	87		1.0		32.7		30.2		0.26	29.1	6.3	5.8	8	14.10.2014 11:30	14.01.2015 17:00
40	2015	2	4.6		82									41.2	5.1	2.1			
40	2015	3	9.1		73									42.3	6.0	1.9			
40	2015	4	13.2	6	64		2.3		35.3		36.4		0.30	85.0	5.4	0.0	7	14.01.2015 17:00	04.04.2015 15:00
40	2015	5	15.4		70									11.7	4.9	2.8			
40	2015	6	20.1		58									3.1	6.9	1.3			
40	2015	7	22.6	15	58		0.6		12.2		60.5		1.12	116.6	5.3	0.8	11	04.04.2015 15:00	15.07.2015 09:45
40	2015	8	22.1		65									116.6	5.3	0.8			
40	2015	9	15.7		75									71.3	6.8	0.7			
40	2015	10	12.2	15	84		0.7		15.8		51.8		0.80	26.9	6.9	2.3	10	15.07.2015 09:45	14.10.2015 14:00
40	2015	11	11.3		85														

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
41	2014	1	0.9		82	5.1		41.8		21				29.8	5.6				
41	2014	2	4.9		71	4.4		48.6		27				8.8	6.0				
41	2014	3	7.7		68	3.3		49.7		38				18.7	6.7				
41	2014	4	12.1		65	2.5		37.6		58				29.2	6.6				
41	2014	5	13.2		67	1.8		36.7		32				85.2	5.6				
41	2014	6	16.5		63	1.6		36.9		59				62.5	6.0				
41	2014	7	20.5		64	2.2		37.7		68				60.2	6.3				
41	2014	8	16.9		67	1.7		45.3		54				33.8	6.5				
41	2014	9	15.6		75	2.5		44.4		43				43.8	6.5				
41	2014	10	12.1		82	2.7		44.3		19				44.9	6.4				
41	2014	11	6.8		84	3.1		37.5		11				7.1	6.4				
41	2014	12	2.6		83	2.7		39.2		26				52.5	7.0				
41	2015	1	2.8	6	89	2.8		38.2		32			0.15	74.4	5.2		30	14.10.2014 16:10	15.01.2015 13:00
41	2015	2	1.5		84	3.0		45.8		30				5.2	6.4				
41	2015	3	5.7		76	2.4		44.7		46				38.8	6.8				
41	2015	4	8.9	4	66	1.7		39.4		61			0.18	21.1	6.8		98	15.01.2015 13:00	15.04.2015 12:00
41	2015	5	12.8		67	1.6		39.1		62				15.8	6.3				
41	2015	6	16.2		69	1.8		37.5		68				40.4	6.6				
41	2015	7	19.0	24	72	1.6		39.8		70			0.42	72.2	6.3		24	15.04.2015 12:00	16.07.2015 10:45
41	2015	8	21.3		66	2.4		38.2		77				26.2	6.8				
41	2015	9	13.3		85	1.6		40.0		41				42.6	6.4				
41	2015	10	8.2	18	87	3.2		46.0		21			0.55	62.3	5.7		16	16.07.2015 10:45	21.10.2015 12:00
41	2015	11	7.2		89	2.0		46.3		23				73.5	6.1				
41	2015	12	6.9		85	2.1		39.3		26				24.9	5.0				

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
44	2014	11	-4.5		85	0.8		1.3					0.08	0.7		16.3			
44	2014	12	-8.6		83	8.7		1.6					0.08	18.6	4.7	2.4			
44	2015	1	-13.3		80	16.8		2.6					0.05	13.4	4.8	3.6			
44	2015	2	-6.1	5	75	6.4		1.0			53.3		0.03	8.9	5.0	4.2	1	12.11.2014 13:10	01.02.2015 11:15
44	2015	3	-1.6		71	2.0		0.6						14.0	5.0	2.1			
44	2015	4	1.2		73	7.8		0.7						29.4	4.4	1.3			
44	2015	5	6.2	-8	70	4.8		0.3			77.7			34.8	4.6	0.6	1	01.02.2015 11:15	01.05.2015 13:00
44	2015	6	9.7		65	6.9		0.5						59.7	4.5	0.9			
44	2015	7	10.3		71	12.3		0.5						29.2	4.4	0.6			
44	2015	8	12.8	8	77	13.0		0.6			60.4			61.1	5.0	0.3	8	01.05.2015 13:00	01.08.2015 13:20
44	2015	9	9.4		81	5.6		0.9						45.1	4.6	0.5			
44	2015	10	1.9		85	3.9		0.9						22.1	5.1	2.4			
44	2015	11	-2.3	7	83	4.3		1.1			55.7			1.2	5.2	0.7	4	01.08.2015 13:20	12.11.2015 08:40

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
45	2014	10	10.0		87			5.4	3.3	67				95.6	5.6	0.7			
45	2014	11	6.0		83			5.7	2.3	61				101.5	5.3	0.1			
45	2014	12	0.4		85			6.5	1.5	57				74.5	5.2	0.2			
45	2015	1	-0.5	3	83		0.4	4.9	1.7	69	58.4		0.19	92.1	5.1	0.1	0.2	13.10.2014 10:00	12.01.2015 11:15
45	2015	2	-2.2		80			7.9		76				52.8	5.1	0.1			
45	2015	3	3.2		70			10.1		80				86.6	5.6	0.3			
45	2015	4	6.8	-1	63		0.4	5.6		95	78.4		0.37	164.0	5.5	0.0	1	12.01.2015 11:15	13.04.2015 11:15
45	2015	5	10.1		74			3.9		91				37.2	5.7	0.2			
45	2015	6	14.5		73			4.5		99				98.7	6.1	0.1			
45	2015	7	18.5	9	61		0.6	4.3		112	97.5		0.51	61.8	6.0	0.1	5	13.04.2015 11:15	10.07.2015 10:15
45	2015	8	16.6		72			4.3		105				94.9	5.7	0.1			
45	2015	9	9.5		79			4.9		79				79.7	5.6	0.1			
45	2015	10	6.2	15	87		0.4	8.6		58	90.0		0.55	40.6	5.0	0.1	9	10.07.2015 10:15	06.10.2015 11:15
45	2015	11	5.9		74			4.1		71				103.4	5.4	0.1			
45	2015	12	4.8		76			3.9		70				29.0	5.3	0.2			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm²month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
50	2014	10	10.2		83	8.0		33.0		18				39.6	6.0	1.2			
50	2014	11	5.8		79	11.0		29.0		15				32.4	6.4	1.0			
50	2014	12	1.2		78	17.0		27.0		25				26.9	6.8	3.4			
50	2015	1	2.0	0	83	19.5		27.0		30			0.59	55.0	6.9	3.4	19	28.10.2014 15:14	27.01.2015 13:55
50	2015	2	2.0		80	28.6		42.0		27				25.0	6.2	13.0			
50	2015	3	6.0		70	18.6		32.0		38				65.0	7.0	1.9			
50	2015	4	10.0	3	61	9.3		26.0		60			0.62	10.0	6.2	2.3	29	27.01.2015 14:00	29.04.2015 13:23
50	2015	5	14.0		69	8.1		26.0		59				55.0	6.3	1.8			
50	2015	6	18.0		67	8.3		23.0		67				55.0	7.2	1.7			
50	2015	7	21.0	16	62	8.5		26.0		69			0.68	45.0	6.5	3.5	16	29.04.2015 13:25	22.07.2015 11:12
50	2015	8	23.0		58	9.3		31.0		75				15.0	6.0	2.0			
50	2015	9	16.0		71	8.5		29.0		45				70.0	6.9	0.8			
50	2015	10	9.0	13	79	14.0		37.0		22			1.02	30.0	7.0	3.6	21	22.07.2015 11:14	26.10.2015 14:36
50	2015	11	7.0		82	15.0		39.0		21				70.0	6.9	0.9			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
51	2014	10	18.7		66	7.9		57.0		21				35.6					
51	2014	11	14.9		75	10.3		58.5		15				35.6					
51	2015	12	12.7		79	12.6		58.0		8				159.4					
51	2015	1	9.9	13	72	12.6		62.8		14			0.23	34.1			33	21.10.2014 12:50	21.01.2015 13:15
51	2015	2	9.7		70	16.5		54.8		21				51.4					
51	2015	3	11.8		72	19.3		52.5		28				93.8					
51	2015	4	15.5	13	58	3.1		52.4		31			0.19	7.4			230	21.01.2015 13:15	21.04.2015 12:42
51	2015	5	21.8		53	3.5		56.2		27				26.0					
51	2015	6	24.7		51	4.6		51.6		35				12.2	7.4				
51	2015	7	29.3	25	42	3.7		52.3		48			1.82	5.0			54	21.04.2015 12:42	21.07.2015 11:15
51	2015	8	28.9		48	2.3		38.0		44				0.4					
51	2015	9	25.6		59	3.6		49.2		24				60.2	7.4				
51	2015	10	19.2	24	70	2.9		44.1		21			1.76	84.0	7.4		80	21.07.2015 11:19	23.10.2015 11:23

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
53	2013	1	0.7		85	4.0		28.0		32				103.0					
53	2013	2	1.3		81	5.0		26.0		45				55.0					
53	2013	3	3.0		73	4.0		23.0		58				39.0					
53	2013	4	11.7		68	3.0		23.0		63				13.0					
53	2013	5	15.0		73	2.0		14.0		59				136.0					
53	2013	6	18.7		70	3.0		11.0		66				144.0					
53	2013	7	22.9		59	4.0		12.0		84				11.0					
53	2013	8	21.3		65	4.0		16.0		73				58.0					
53	2013	9	15.2		74	3.0		16.0		49				90.0					
53	2013	10	11.0		82	4.0		28.0		28				27.0					
53	2013	11	6.3		81	2.0		24.0		27				41.0					
53	2013	12	3.2		83	2.0		27.0		25				18.0					
53	2014	1	2.2		86	5.0		30.0		19				8.0					
53	2014	2	4.1		81	4.0		29.0		36				21.0					
53	2014	3	9.2		67	4.0		26.0		52				12.0					
53	2014	4	12.6		72	3.0		21.0		57				66.0					
53	2014	5	14.9		70	3.0		12.0		63				189.0					
53	2014	6	19.6		59	4.0		13.0		70				33.0					
53	2014	7	21.9		67	3.0		13.0		69				91.0					
53	2014	8	19.0		74	2.0		15.0		58				110.0					
53	2014	9	15.9		83	3.0		18.0		45				109.0					
53	2014	10	12.2		85	4.0		25.0		27				37.0					
53	2014	11	8.1		88	5.0		26.0		22				34.0					
53	2014	12	3.9		78	4.0		24.0		32				43.0					
53	2015	1	3.0	2	81	4.0		26.0		37			0.32	71.0			4	24.10.2014 12:00	30.01.2015 10:00
53	2015	2	2.3		80	5.0		29.0		45				37.0					
53	2015	3	6.6		69	4.0		26.0		54				40.0					
53	2015	4	11.2	6	55	4.0		17.0		74			0.56	22.0			8	30.01.2015 10:00	17.04.2015 11:00
53	2015	5	15.4		68	4.0		15.0		68				48.0					
53	2015	6	20.0		59	5.0		14.0		78				24.0					
53	2015	7	24.1	19	55	5.0		18.0		85			0.96	34.0			13	17.04.2015 11:00	17.07.2015 08:00
53	2015	8	23.6		59	4.0		22.0		81				44.0					
53	2015	9	16.1		69	2.0		17.0		59				50.0					
53	2015	10	9.9	15	85	4.0		24.0		29			1.00	80.0			21	17.07.2015 08:00	21.10.2015 10:00
53	2015	11	8.5		74	3.0		25.0		37				37.0					
53	2015	12	4.1		87	4.0		31.0		18				25.0					

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
55	2014	11																	
55	2014	12																	
55	2015	1																	
55	2015	2																	
55	2015	3		-7			3.6			29			0.13				27	03.12.2014 11:00	03.03.2015 12:00
55	2015	4																	
55	2015	5																	
55	2015	6																	
55	2015	7																	
55	2015	8																	
55	2015	9																	
55	2015	10																	
55	2015	11																	
55	2012	12																	

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/ cm^2month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
57	2014	10	5.4		84									27.1	4.7	0.3			
57	2014	11	1.7		93									34.5	4.6	0.2			
57	2014	12	-1.8		92									50.2	4.6	0.4			
57	2014	1	-3.0	1	89		1.1		9.4		41.3		0.50	63.7	4.7	0.4	4	30.10.2014 10:30	30.01.2015 10:45
57	2015	2	-0.7		87									28.8	4.5	0.3			
57	2015	3	1.2		76									29.4	4.7	0.2			
57	2015	4	4.9	-3	72		0.9		8.2		60.8		0.37	42.3	5.0	0.1	16	30.01.2015 10:50	30.04.2015 11:30
57	2015	5	9.5		68									37.4	4.9	0.1			
57	2015	6	13.1		71									67.0	4.9	0.1			
57	2015	7	15.6	17	76		0.5		3.9		58.4		0.26	82.9	5.0	0.2	12	30.04.2015 11:45	28.07.2015 10:15
57	2015	8	16.4		73									38.6	5.4	0.2			
57	2015	9	11.9		87									64.2	4.8	0.2			
57	2015	10	4.6	1	86		0.5		6.6		47.6		0.18	14.6	4.8	0.5	8	28.07.2015 10:15	30.10.2015 13:30
57	2015	11	3.8		94									69.1	4.8	0.2			
57	2015	12	1.6		89									58.7	4.9	0.4			

Site no	Year	Month	Temp (°C)	IVL Temp (°C)	RH (%)	SO2 (µg/m3)	IVL-SO2 (µg/m3)	NO2 (µg/m3)	IVL-NO2 (µg/m3)	O3 (µg/m3)	IVL-O3 (µg/m3)	HNO3 (µg/m3)	IVL-HNO3 (µg/m3)	Prec. (mm)	pH	Cl- (mgCl/l)	IVL-Particle depositon (µg/cm^{2}month)	Date for mounting of IVL passive samplers	Date for demounting of IVL passive samplers
59	2014	10	10.2		83	2.4		17.6		23				85.5	6.0	1.0			
59	2014	11	7.1		80	3.1		19.9		29				23.3	8.3	2.2			
59	2014	12	1.3		80	5.3		17.5		25				59.7	4.9	2.1			
59	2015	1	-1.5	4	81	5.1		14.1		42			0.30	47.3	6.4	1.0	7	01.10.2014 08:00	07.01.2015 08:30
59	2015	2	-0.1		76	6.8		33.4		37				24.9	6.3	1.0			
59	2015	3	4.3		65	6.6		27.6		45				64.8	7.0	2.5			
59	2015	4	8.2	4	60	5.6		21.4		62			0.37	56.1	7.3	1.0	9	07.01.2015 08:30	01.04.2015 08:30
59	2015	5	13.1		68	7.4		24.7		59				88.5	7.7	1.0			
59	2015	6	17.8		70	7.3		31.0		50				51.3	6.5	1.0			
59	2015	7	17.7	15	71	6.0		27.6		38			0.58	63.9	5.2	1.0	16	01.04.2015 08:30	02.07.2015 08:15
59	2015	8	22.6		72	12.3		17.0		46				46.8	7.3	1.0			
59	2015	9	15.2	13	77	10.6		19.0		39			0.71	51.6	7.1	2.5	15	02.07.2015 08:15	30.09.2015 08:30
59	2015	10	8.9		87	8.9		24.1		21				35.7	7.0	3.6	24		
59	2015	11	4.4		90	6.0		17.0		23				86.1	7.2	3.0	23		
59	2015	12	2.4		93	21.1		19.5		62				25.8	6.8	3.6	27		
59	2016	1	-2.6		80	41.7		22.2		138				27.3	6.9	2.9	46		
59	2016	2	3.6		85	34.7		14.2		49				96.6	6.6	2.3	31		
59	2016	3	5.4		70	25.4		12.9		42				34.2	6.9	2.4	20		
59	2016	4	9.9		68	11.0		11.9		86				69.9	6.9	<2	21		
59	2016	5	14.2		69	13.1		7.3		131				59.4	7.3	<2	16		
59	2016	6	18.8		68	9.6		12.6		52				42.3	7.0	2.1	22		
59	2016	7	23.1		71	10.1		13.9		49				44.0	6.9	<2	20		

Table A.2: Optional data

			Optional								
	Sampling		Precipitation								Particles
	Period		Conductivity	SO42-	NO3-	NH4+	Na+	Ca2+	Mg2+	K+	conc. PM10
Site no	Year	Month	µS/cm	mgS/l	mgN/l	mgN/l	mgNa/l	mgCa/l	mgMg/l	mgK/l	µg/m^3
01	2014	10	16	8.40	7.00						25
01	2014	11	36	7.70	2.30						26
01	2014	12	45	3.50	12.70						18
01	2015	1	64		5.10						15
01	2015	2	136	23.70	2.40						31
01	2015	3	52	14.10	0.20						27
01	2015	4	48	13.70	0.80						21
01	2015	5	31	12.40	0.80						17
01	2015	6	73	17.20	2.70						17
01	2015	7	158		1.80						18
01	2015	8		11.90	4.40						25
01	2015	9	78		4.10						19
Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
03	2014	10	17	7.20	6.20						36
03	2014	11		13.40	1.10						36
03	2014	12	35	15.00	12.70						26
03	2015	1	84	22.90	0.00						21
03	2015	2	399	107.00	4.40						39
03	2015	3	154	17.00	0.10						35
03	2015	4	66	22.80	0.90						19
03	2015	5	79	24.40	2.60						13
03	2015	6	246	38.70	5.20						18
03	2015	7		30.70	1.00						21
03	2015	8	122	19.80	2.70						30
03	2015	9	602	90.60	2.50						18

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
10	2014	1	44	0.83	0.42	0.57	1.23	1.23	0.54	0.14	21
10	2014	2	49	1.29	0.48	0.87	1.23	1.47	1.33	0.11	21
10	2014	3	52	1.96	0.62	1.34	1.29	1.33	0.52	0.10	36
10	2014	4	33	1.37	0.98	2.70	1.18	3.59	1.37	0.88	27
10	2014	5	20	1.04	0.67	1.81	0.70	2.16	0.17	0.30	16
10	2014	6	23	0.87	0.64	1.51	0.54	2.42	0.24	0.41	15
10	2014	7	19	0.70	0.40	1.10	0.50	1.86	0.02	0.33	20
10	2014	8	22	0.71	0.43	1.00	0.47	1.89	0.00	0.16	15
10	2014	9	19	0.54	0.52	0.88	0.37	2.20	0.07	0.02	23
10	2014	10	27	0.87	0.30	0.72	0.96	1.74	0.03	0.15	23
10	2014	11	26	0.89	0.27	0.04	0.36	1.43	0.00	1.30	24
10	2014	12	26	1.20	0.43	0.07	0.75	1.42	0.00	0.64	24
10	2015	1	25	1.10	0.38	0.25	2.39	1.64	0.05	0.11	33
10	2015	2	37	1.33	0.43	0.83	1.34	1.31	0.22	0.06	25
10	2015	3	19	1.06	0.37	1.11	1.05	1.01	0.26	0.06	37
10	2015	4	26	1.02	0.74	1.39	1.16	1.77	0.28	0.08	25
10	2015	5	35	1.79	0.56	1.09	0.74	2.67	0.39	0.70	18
10	2015	6	34	0.93	0.65	0.99	0.65	2.13	0.23	0.09	17
10	2015	7	27	1.23	0.58	1.17	0.64	1.93	0.27	0.19	17
10	2015	8	18	0.53	0.38	0.75	0.33	0.93	0.17	0.04	18
10	2015	9	19	0.83	0.40	0.43	0.73	5.72	0.21	0.07	13
10	2015	10	31	0.80	0.52	0.76	0.24	0.77	0.15	0.06	23
10	2015	11	21	0.89	0.30	0.60	1.13	0.87	0.29	0.16	21
10	2015	12	26	1.35	0.53	1.10	0.76	1.43	0.23	0.05	22

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
13	2014	10									23
13	2014	11									30
13	2014	12									35
13	2015	1									28
13	2015	2									25
13	2015	3									24
13	2015	4									20
13	2015	5									20
13	2015	6									20
13	2015	7									25
13	2015	8									21
13	2015	9									19
13	2015	10									19
13	2015	11									33

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
14	2014	10									11
14	2014	11									14
14	2015	12									10
14	2015	1									8
14	2015	2									7
14	2015	3									11
14	2015	4									10
14	2015	5									10
14	2015	6									12
14	2015	7									16
14	2015	8									10
14	2015	9									9
14	2015	10									7
14	2015	11									9

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
15	2014	10									48
15	2014	11									46
15	2015	12									44
15	2015	1									58
15	2015	2									60
15	2015	3									47
15	2015	4									31
15	2015	5									26
15	2015	6									27
15	2015	7									26
15	2015	8									22
15	2015	9									23
15	2015	10									36
15	2015	11									64

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
16	2014	10									
16	2014	11									
16	2015	12									
16	2015	1									
16	2015	2									
16	2015	3									
16	2015	4									
16	2015	5									
16	2015	6									
16	2015	7									
16	2015	8									
16	2015	9									
16	2015	10									
16	2015	11									

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
21	2014	10	11	0.26	0.24	0.15	0.38	0.19	0.06	0.28	
21	2014	11	18	0.50	0.47	0.39	0.49	0.30	0.07	0.39	
21	2014	12	56	1.09	0.66	0.67	4.74	1.35	1.23	1.18	
21	2015	1	21	0.27	0.34	0.27	2.03	0.32	0.33	0.16	
21	2015	2	37	0.63	0.80	0.70	4.11	0.64	0.35	0.31	
21	2015	3	27	0.22	0.45	0.54	0.88	0.54	0.12	0.14	
21	2015	4	28	0.41	0.93	1.11	1.18	1.24	0.18	0.47	
21	2015	5	11	0.19	0.32	0.29	0.54	0.38	0.10	0.39	
21	2015	6	11	0.15	0.18	0.14	0.38	0.42	0.09	0.50	
21	2015	7	9	0.13	0.08	0.01	0.35	0.41	0.08	0.22	
21	2015	8	8	0.11	0.08	-0.01	0.39	0.35	0.08	0.08	
21	2015	9	5	0.06	0.11	0.05	0.21	0.12	0.03	0.05	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
23	2014	10	17	0.37	0.20	0.18	1.06	0.13	0.13	0.08	7
23	2014	11	22	0.44	0.39	0.34	1.17	0.13	0.14	0.09	4
23	2014	12	30	0.50	0.16	0.09	3.35	0.28	0.39	0.17	3
23	2015	1	28	0.39	0.23	0.14	2.86	0.20	0.34	0.13	4
23	2015	2	32	0.52	0.66	0.65	2.71	0.21	0.32	0.17	7
23	2015	3	13	0.21	0.34	0.30	1.22	0.19	0.16	0.13	6
23	2015	4	18	0.35	0.64	0.80	0.67	0.33	0.09	0.22	5
23	2015	5	10	0.18	0.25	0.24	0.60	0.14	0.08	0.10	
23	2015	6	13	0.23	0.23	0.32	1.02	0.21	0.14	0.11	5
23	2015	7	6	0.08	0.11	0.09	0.15	0.07	0.03	0.07	5
23	2015	8	11	0.22	0.27	0.34	0.37	0.23	0.06	0.05	
23	2015	9	12	0.24	0.24	0.29	0.58	0.07	0.07	0.05	5
23	2015	10	37	0.72	0.60	0.43	2.50	0.26	0.31	0.18	6

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
24	2008	10		N.A.	N.A.						
24	2008	11		0.33	0.35						
24	2008	12		0.44	0.56						14 (Y)
24	2009	1		0.91	0.63						Y=
24	2009	2		0.64	0.80						Yearly
24	2009	3		0.41	0.41						aver.
24	2009	4		1.82	0.88						
24	2009	5		0.44	0.30						
24	2009	6		0.15	0.12						
24	2009	7		0.25	0.19						
24	2009	8		0.45	0.20						
24	2009	9		0.76	0.00						
24	2009	10		0.61	0.11						
24	2009	11		*0.32*	*0.41*						
24	2009	12		*0.34*	*0.36*						14 (Y)
24	2010	1		*0.35*	*0.68*						
24	2010	2		*0.39*	*0.74*						
24	2010	3		*0.37*	*0.57*						
24	2010	4									
24	2010	5									
24	2010	6									
24	2010	7		*Italics means that data*							
24	2010	8		*from a nearby station*							
24	2010	9		*"Kaanan"*							
24	2010	10									
24	2010	11									
24	2010	12									13 (Y)

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
24	2011	1		*0.65*	*0.98*						
24	2011	2		*0.65*	*0.56*						
24	2011	3		*0.72*	*0.97*						
24	2011	4		*0.38*	*0.56*						
24	2011	5		*0.39*	*0.47*						
24	2011	6		*0.25*	*0.30*						
24	2011	7		*0.65*	*0.56*						
24	2011	8		*0.28*	*0.23*						
24	2011	9		*0.27*	*0.23*						
24	2011	10									
24	2011	11		*0.49*	*0.69*						
24	2011	12		*0.17*	*0.28*						15
24	2012	1		*0.17*	*0.24*						12
24	2012	2		*0.26*	*0.43*						14
24	2012	3		*0.38*	*0.49*						24
24	2012	4		*0.21*	*0.23*						15
24	2012	5		*0.48*	*0.43*						17
24	2012	6		*0.14*	*0.16*						11
24	2012	7		*0.22*	*0.24*						13
24	2012	8		*0.16*	*0.19*						12
24	2012	9		*0.28*	*0.27*						10
24	2012	10		*0.17*	*0.26*						10
24	2012	11		*0.23*	*0.30*						12
24	2012	12		*0.40*	*0.46*						10

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
24	2013	1		*0.38*	*0.46*						10
24	2013	2		*0.39*	*0.52*						12
24	2013	3		*0.61*	*0.71*						26
24	2013	4		*0.59*	*0.84*						21
24	2013	5		*0.43*	*0.43*						21
24	2013	6		*0.50*	*0.28*						14
24	2013	7		*0.49*	*0.23*						14
24	2013	8									16
24	2013	9		*0.13*	*0.00*						12
24	2013	10		*0.15*	*0.28*						11
24	2013	11		*0.13*	*0.22*						11
24	2013	12		*0.25*	*0.37*						12
24	2014	1		*0.36*	*0.46*						9
24	2014	2		*0.58*	*0.66*						20
24	2014	3		*0.43*	*0.51*						21
24	2014	4									18
24	2014	5									14
24	2014	6									11
24	2014	7									14
24	2014	8									13
24	2014	9									14
24	2014	10		*1.77*	*1.05*						11
24	2014	11		*0.35*	*0.38*						12
24	2014	12									8
24	2015	1									8
24	2015	2									10
24	2015	3									19
24	2015	4									15
24	2015	5									11
24	2015	6									11
24	2015	7									11
24	2015	8									13
24	2015	9									11
24	2015	10									12

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
26	2008	10		*0.23*	*0.25*	*Italics (SO_4^{2-}, NO_3^-): data from nearby station "Tyresta"*					
26	2008	11		*0.29*	*0.35*						
26	2008	12		*0.45*	*0.52*						
26	2009	1		*0.88*	*0.68*						
26	2009	2		0.46	0.35						
26	2009	3		0.5	0.43						
26	2009	4		1.27	1.77						
26	2009	5		0.27	0.36						
26	2009	6		0.22	0.24						
26	2009	7		0.16	0.16						
26	2009	8		0.19	0.23						
26	2009	9		0.39	0.35						
26	2009	10		0.22	0.27						
26	2009	11		0.33	0.57						
26	2009	12									7.3 (Y)
26	2010	1		0.36	0.4						Y=
26	2010	2		0.39	0.68						Yearly
26	2010	3		0.58	0.81						aver.
26	2010	4		0.37	0.44						
26	2010	5		0.34	0.2						
26	2010	6		0.19	0.17						
26	2010	7		0.25	0.2						
26	2010	8		0.32	0.15						
26	2010	9		0.17	0.24						
26	2010	10		0.31	0.41						
26	2010	11		0.21	0.29						
26	2010	12		0.31	0.52						

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
26	2011	1		0.3	0.47						
26	2011	2		0.23	0.57						
26	2011	3		0.57	0.42						
26	2011	4		0.52	0.95						
26	2011	5		0.42	0.47						
26	2011	6		0.17	0.2						
26	2011	7		0.43	0.23						
26	2011	8		0.36	0.22						
26	2011	9		0.7	0.5						
26	2011	10		0.25	0.31						
26	2011	11		0.31	0.39						
26	2011	12		0.18	0.27						
26	2012	1		0.16	0.26						
26	2012	2		0.13	0.33						
26	2012	3		0.14	0.21						7
26	2012	4		0.28	0.37						
26	2012	5		0.41	0.44						
26	2012	6		0.17	0.15						7
26	2012	7		0.22	0.25						9
26	2012	8		0.3	0.38						7
26	2012	9		0.25	0.37						7
26	2012	10		0.29	0.39						6
26	2012	11									9
26	2012	12									7

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
26	2013	1									6
26	2013	2									7
26	2013	3									5
26	2013	4									8
26	2013	5									10
26	2013	6									9
26	2013	7		0.16	0.20						7
26	2013	8		0.15	0.20						7
26	2013	9		0.20	0.17						6
26	2013	10		0.23	0.35						
26	2013	11		0.12	0.18						
26	2013	12		0.21	0.40						7
26	2014	1		0.40	0.46						7
26	2014	2		0.50	0.70						14
26	2014	3		0.59	0.49						11
26	2014	4		0.27	0.39						9
26	2014	5		0.27	0.28						
26	2014	6		0.30	0.19						
26	2014	7		0.39	0.21						13
26	2014	8		0.25	0.19						10
26	2014	9		0.44	0.16						12
26	2014	10									11
26	2014	11									12
26	2014	12									8
26	2015	1									7
26	2015	2									9
26	2015	3									10
26	2015	4									8
26	2015	5									8
26	2015	6									
26	2015	7									
26	2015	8									
26	2015	9									8
26	2015	10									8
26	2015	11									7
26	2015	12									7

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
31	2014	10									26
31	2014	11	21	0.42	0.18						23
31	2014	12	8	0.24	0.16						17
31	2015	1	14	0.28	0.19						17
31	2015	2	19	0.32	0.19						9
31	2015	3	38	0.62	0.31						12
31	2015	4	26	0.53	0.34						16
31	2015	5	74	0.91	1.05						18
31	2015	6	66	1.36	0.80						15
31	2015	7	60	1.27	0.89						18
31	2015	8	29	0.62	0.52						18
31	2015	9	55	0.54	0.94						12
31	2015	10	21	0.39	0.24						12

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
33	2014	10	**5**	**0.16**	**0.08**	**0.10**	**0.18**	**0.11**	**0.03**	**0.03**	
33	2014	11	5	0.13	0.05	0.05	0.17	0.20	0.03	0.03	
33	2014	12	8	0.26	0.14	0.20	0.27	0.56	0.06	0.06	
33	2015	1	5	0.11	0.10	0.15	0.12	0.26	0.02	0.10	
33	2015	2	7	0.06	0.05	0.09	0.12	0.16	0.02	0.11	
33	2015	3	21	0.49	0.30	0.58	0.27	2.96	0.11	0.12	
33	2015	4	14	0.44	0.29	0.28	0.22	1.37	0.07	0.06	
33	2015	5	29	0.59	0.70	1.26	0.32	1.65	0.15	0.22	
33	2015	6	13	0.34	0.30	0.45	0.16	0.77	0.07	0.05	
33	2015	7	38	1.07	1.15	1.06	0.51	3.78	0.28	0.25	
33	2015	8	68	0.48	0.50	0.51	0.34	2.03	0.14	0.10	
33	2015	9	10	0.21	0.15	0.26	0.22	0.38	0.03	0.09	
33	2015	10	20	0.22	0.14	0.21	0.27	0.25	0.06	0.05	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
35	2014	10	17	0.43	0.23	0.23	0.28	2.81	0.43	0.70	6
35	2014	11	15	0.49	0.59	0.66	0.08	1.45	0.18	0.04	5
35	2014	12	9	0.17	0.17	0.15	0.27	0.77	0.10	0.03	3
35	2014	1	10	0.20	0.22	0.14	0.97	0.56	0.14	0.20	6
35	2015	2	20	0.55	0.94	0.84	0.53	0.98	0.21	0.06	10
35	2015	3	14	0.45	0.59	0.37	3.38	1.41	0.24	0.09	11
35	2015	4	11	0.40	0.39	0.49	0.19	0.92	0.09	0.02	4
35	2015	5	12	0.33	0.36	0.54	0.26	1.86	0.14	0.14	6
35	2015	6	8	0.23	0.13	0.15	0.10	0.77	0.10	0.09	7
35	2015	7	4	0.09	0.03	0.03	0.05	0.02	0.01	0.03	5
35	2015	8	8	0.20	0.22	0.35	0.22	0.44	0.06	0.03	6
35	2015	9	8	0.26	0.21	0.12	0.22	0.77	0.09	0.03	6
35	2015	10	10	0.23	0.12	0.04	0.33	0.72	0.10	0.32	6
35	2015	11	8	0.11	0.15	0.06	0.26	0.27	0.06	0.04	3

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
40	2014	10	40	0.75	0.66	1.31	1.42	2.06	0.19	0.33	
40	2014	11	18	0.52	0.37	0.45	0.89	0.88	0.12	0.07	
40	2014	12	18	0.52	0.37	0.45	0.89	0.88	0.12	0.07	
40	2015	1	97	0.83	0.63	0.73	3.31	1.13	0.30	0.16	
40	2015	2	25	0.49	0.37	0.68	1.19	0.62	0.09	0.08	
40	2015	3	35	0.84	0.73	1.23	1.13	1.80	0.14	0.14	
40	2015	4	28	0.27	0.34	0.46	0.16	0.82	0.05	0.18	
40	2015	5	98	0.81	0.89	0.38	2.03	3.81	0.30	0.39	
40	2015	6	864	0.77	1.50	1.00	0.70	5.00	0.18	0.43	
40	2015	7	49	0.37	0.53	0.39	0.48	2.73	0.09	0.19	
40	2015	8	49	0.37	0.53	0.39	0.48	2.73	0.09	0.19	
40	2015	9	55	0.26	0.32	0.29	0.44	1.10	0.07	0.07	
40	2015	10	34	0.61	0.82	0.56	0.92	1.80	1.21	0.14	

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
41	2014	1									43
41	2014	2									36
41	2014	3									45
41	2014	4									29
41	2014	5									20
41	2014	6									21
41	2014	7									28
41	2014	8									23
41	2014	9									33
41	2014	10									35
41	2014	11									42
41	2014	12									30
41	2015	1									31
41	2015	2									39
41	2015	3									24
41	2015	4									24
41	2015	5									24
41	2015	6									21
41	2015	7									24
41	2015	8									31
41	2015	9									21
41	2015	10									42
41	2015	11									100
41	2015	12									100

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
44	2014	11		2.29	0.07	-0.01	9.50	1.38	1.15	0.38	2
44	2014	12	18	0.39	0.11	0.04	1.38	0.21	0.18	0.08	4
44	2015	1	23	0.41	0.17	0.01	2.00	0.19	0.27	0.08	
44	2015	2	24	0.39	0.14	0.04	2.33	0.26	0.30	0.11	
44	2015	3	15	0.30	0.14	0.14	1.18	0.22	0.16	0.08	4
44	2015	4	29	0.91	0.34	0.35	0.73	0.18	0.10	0.05	4
44	2015	5	17	0.63	0.11	0.17	0.35	0.14	0.06	0.05	4
44	2015	6	18	0.60	0.10	0.05	0.51	0.21	0.09	0.10	4
44	2015	7	21	0.82	0.08	0.17	0.39	0.12	0.09	0.13	
44	2015	8	15	0.81	0.08	0.70	0.22	0.10	0.06	0.34	5
44	2015	9	16	0.58	0.09	0.06	0.30	0.09	0.06	0.04	5
44	2015	10	13	0.29	0.09	0.10	1.21	0.20	0.17	0.09	2
44	2015	11	6	0.07	0.09	0.04	0.38	0.15	0.10	0.06	3

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
45	2014	10	8	0.24	0.22	0.28	0.42	0.23	0.06	0.05	6
45	2014	11	4	0.07	0.13	0.09	0.02	0.12	0.01	0.01	5
45	2014	12	6	0.13	0.13	0.08	0.13	0.10	0.01	0.03	3
45	2015	1	5	0.06	0.13	0.08	0.07	0.03	0.01	0.01	3
45	2015	2	6	0.07	0.19	0.12	0.09	0.06	0.01	0.01	6
45	2015	3	6	0.09	0.17	0.26	0.17	0.10	0.02	0.02	13
45	2015	4	4	0.07	0.10	0.13	0.01	0.13	0.01	0.01	7
45	2015	5	7	0.18	0.21	0.39	0.10	0.16	0.02	0.11	8
45	2015	6	7	0.16	0.20	0.45	0.04	0.39	0.03	0.04	9
45	2015	7	8	0.20	0.24	0.40	0.09	0.37	0.03	0.05	12
45	2015	8	7	0.27	0.22	0.46	0.03	0.22	0.02	0.03	9
45	2015	9	4	0.07	0.14	0.17	0.05	0.13	0.01	0.01	6
45	2015	10	9	0.13	0.34	0.34	0.04	0.06	0.01	0.02	8
45	2015	11	3	0.04	0.06	0.06	0.07	0.04	0.01	0.01	5
45	2015	12	5	0.10	0.13	0.13	0.13	0.05	0.02	0.02	6

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
50	2014	10	16	2.33	0.43	0.62	0.67	1.02	0.12	0.30	47
50	2014	11	18	2.39	0.28	0.33	0.32	1.12	0.13	0.25	50
50	2014	12	27	2.70	0.57	0.46	0.97	2.35	0.17	1.03	53
50	2015	1	28	1.88	0.38	0.41	1.43	1.08	0.10	0.25	41
50	2015	2	66	2.95	0.76	0.83	1.49	1.29	0.14	9.03	73
50	2015	3	28	2.24	0.42	0.84	0.47	1.82	0.65	0.49	57
50	2015	4	30	3.50	0.52	0.93	0.97	1.54	0.20	0.25	40
50	2015	5	30	3.71	0.58	1.02	0.38	1.40	0.27	1.39	26
50	2015	6	28	2.67	0.59	1.00	0.44	1.76	0.24	1.82	24
50	2015	7	28	2.48	0.70	1.37	0.13	1.53	0.20	2.47	23
50	2015	8	41	5.84	0.83	1.46	0.41	2.34	0.27	1.05	33
50	2015	9	20	2.69	0.38	0.56	0.27	0.97	0.13	0.35	24
50	2015	10	34	2.77	0.43	0.42	0.52	1.31	0.16	2.21	55
50	2015	11	17	1.50	0.34	0.53	0.30	0.51	0.09	0.31	61

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
51	2014	10									34
51	2014	11									42
51	2015	12									49
51	2015	1									53
51	2015	2									61
51	2015	3									36
51	2015	4									30
51	2015	5									33
51	2015	6									28
51	2015	7									31
51	2015	8									33
51	2015	9									37
51	2015	10									35

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
53	2013	1									31
53	2013	2									31
53	2013	3									29
53	2013	4									30
53	2013	5									16
53	2013	6									14
53	2013	7									17
53	2013	8									19
53	2013	9									13
53	2013	10									24
53	2013	11									21
53	2013	12									22
53	2014	1									34
53	2014	2									27
53	2014	3									34
53	2014	4									26
53	2014	5									13
53	2014	6									14
53	2014	7									15
53	2014	8									11
53	2014	9									20
53	2014	10									27
53	2014	11									31
53	2014	12									19
53	2015	1									19
53	2015	2									31
53	2015	3									29
53	2015	4									
53	2015	5									17
53	2015	6									16
53	2015	7									16
53	2015	8									21
53	2015	9									12
53	2015	10									25
53	2015	11									21
53	2015	12									26

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
55	2014	11									22
55	2014	12									10
55	2015	1									10
55	2015	2									
55	2015	3									
55	2015	4									
55	2015	5									
55	2015	6									
55	2015	7									
55	2015	8									
55	2015	9									
55	2015	10									
55	2015	11									
55	2012	12									

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
57	2014	10									
57	2014	11									
57	2014	12									
57	2014	1									
57	2015	2									
57	2015	3									
57	2015	4									
57	2015	5									
57	2015	6									
57	2015	7									
57	2015	8									
57	2015	9									
57	2015	10									
57	2015	11									
57	2015	12									

Site no	Year	Month	Conductivity mS/cm	SO42- mgS/l	NO3- mgN/l	NH4+ mgN/l	Na+ mgNa/l	Ca2+ mgCa/l	Mg2+ mgMg/l	K+ mgK/l	Conc. PM10 µg/m^3
59	2014	10	18	0.11	1.03						28
59	2014	11	53	0.13	1.78						34
59	2014	12	33	0.14	1.93						42
59	2015	1	35	0.14	2.67						34
59	2015	2	56	0.14	5.81						46
59	2015	3	39	0.11	2.16						41
59	2015	4	43	0.17	1.31						25
59	2015	5	17	0.19	0.05						31
59	2015	6	37	0.05	4.05						27
59	2015	7	49	0.13	3.00						38
59	2015	8	51	0.15	2.91						29
59	2015	9	48	0.14	2.96						20
59	2015	10	63	0.16	4.36						
59	2015	11	54	0.18	3.67						
59	2015	12	35	0.23	0.95						
59	2016	1	41	0.20	2.74						
59	2016	2	28	0.16	1.96						
59	2016	3	31	0.21	2.16						
59	2016	4	41	0.27	1.06						
59	2016	5	35	0.19	< 0,5						
59	2016	6	34	0.21	1.02						
59	2016	7	37	0.27	2.13						

Appendix B

Annual average values for the test sites for the exposure period.

Table B.1: Mandatory data including measurement with IVL passive samplers (grey cells)

		Mandatory													
		Climate		Gases								Precipitation			Particles
	Sampling period	Temp	RH	SO_2	IVL-passive SO_2	NO_2	IVL-passive NO_2	O_3	IVL-passive O_3	HNO_3	IVL-passive HNO_3	Amount	H^+	Cl^-	IVL passive sampler. Three-monthly avarages,
Site no	Year	° C	%	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	mm	pH	mgCl/l	(µg / cm^2 month)
01	14/15	11.0	72.5	4.6		37.8		36.6			0.8	413.7	5.7	6.2	6.0
03	14/15	10.8	71.4	11.4		34.4		50.3			0.4	433.2	4.5	4.9	11.1
10	14/15	11.4	77.9	8.8		26.8		39.5			0.5	880.1	5.3	1.4	12.3
13	14/15	18.0	66.2	0.8		30.7		46.2			1.0	1115.1			22.3
14	14/15	15.5	73.4	1.2		9.5		89.9			0.4	1114.1	6.0		22.8
15	14/15	15.8	62.6	4.4		43.2		42.2			1.4	1037.2			19.4
16	14/15	15.0	77.4	1.2		33.1		50.2			1.2	881.0			9.0
21	14/15	7.5	76.3	4.2		22.9			41.5		0.2	804.9	5.2	1.4	11.6
23	14/15	6.5	82.3	0.2		0.6		64.4	55.4*	0.3	0.1	2194.5	4.9	2.2	6.3
24	14/15	8.3	81.1	0.5	0.5*	13.2	10.0*	50.3	54.9*		0.4	329.7	5.2	0.4	20.8
26	14/15	7.2	82.5	0.3	0.3*	1.3	1.4*	51.3	49.3*		0.1	784.2	5.2	0.4	3.8
31	14/15	16.0	63.3	0.7		28.1		61.8			1.0	302.7	6.5	1.7	12.8
33	14/15	12.8	59.7	0.5		2.7		91.2			0.4	515.8	5.9	0.4	7.5
35	14/15	6.8	82.2	0.9		2.5		53.6			0.2	501.4	4.8	0.5	5.1
40	14/15	13.2	74.3		1.1		23.3		45.4		0.6	668.0	5.2	1.4	9.4
41	14/15	10.3	76.9	2.3		40.3		45.2			0.3	441.2	5.8		43.5
44	14/15	1.5	76.3	7.4		1.0			61.7		0.1	337.1	4.6	1.2	3.5
45	14/15	7.7	75.8		0.5	5.7*	2.2	82.6*	80.9		0.4	1039.4	5.4	0.2	3.7
50	14/15	10.7	71.4	13.4		29.6		44.3			0.7	484.3	6.6	2.7	21.3
51	14/15	18.7	62.4	7.9		52.5		26.3			1.0	569.5	7.4[1]		98.3
53	14/15	12.0	70.5	4.2		21.5		55.3			0.7	527.0			11.8
55[1]	14/15				3.6				28.6		0.1				14.8
57	14/15	6.1	80.8		0.7		7.1		51.9		0.3	553.6	4.8[2]	0.2[2]	10.0
59	14/15	9.7	73.6	6.5		22.6		41.2			0.5	663.7	5.7	1.5	11.8

* Recommended value to use in analysis. [1] 3 months of data. [2] Temperature and RH values from data in nine months.

Table B.2: Optional data

		Optional								
		Precipitation								Particles
	Sampling period	Cond.	SO_4^{2-}	NO_3^-	NH_4^+	Na^+	Ca_2^+	Mg_2^+	K^+	Conc. PM_{10}
Site no	Year	µS/cm	mgS/l	mgN/l	mgN/l	mgNa/l	mgCa/l	mgMg/l	mgK/l	µg/m^3
01	14/15	47.8	9.69	4.04						21.5
03	14/15	130.6	26.12	3.13						26.0
10	14/15	24.4	0.99	0.43	0.69	0.93	1.91	0.16	0.22	22.9
13	14/15									23.8
14	14/15									10.3
15	14/15									37.1
16	14/15									
21	14/15	15.2	0.26	0.31	0.27	0.86	0.38	0.14	0.29	
23	14/15	17.8	0.31	0.30	0.30	1.26	0.16	0.15	0.10	5.0
24	14/15									12.2
26	14/15									7.8
31	14/15	27.4	0.52	0.34						15.6
33	14/15	13.2	0.26	0.17	0.26	0.21	0.83	0.06	0.07	12.7
35	14/15	9.1	0.25	0.25	0.24	0.41	0.73	0.10	0.07	6.4
40	14/15	45.0	0.45	0.48	0.52	0.78	1.71	0.11	0.15	
41	14/15									28.8
44	14/15	18.0	0.63	0.12	0.22	0.67	0.16	0.11	0.13	3.8
45	14/15	5.8	0.13	0.17	0.23	0.10	0.17	0.02	0.03	7.3
50	14/15	29.0	2.74	0.51	0.78	0.59	1.47	0.24	1.45	41.6
51	14/15									38.9
53	14/15									21.5
55	14/15									
57	14/15									
59	14/15	36.3	0.14	2.22						32.9

Table B.3: Reported start dates for exposures

No	Name	Country	Rack Coordinates	Start date	End date 1 year
01	Prague	Czech Republic	+50°06'20.8", 14°26'51.8"	2014-10-04	2015-10-10
03	Kopisty	Czech Republic	+50°32'39.4", 13°37'24.4"	2014-10-03	2015-10-09
10	Bottrop	Germany	+51°31'33.0", 06°58'37.4"	2014-10-01	2015-10-14
13	Rome	Italy	+41°54'20.0", 12°31'02.3"	2014-10-21	2015-10-27
14	Casaccia	Italy	+42°02'26.5", 12°18'09.5"	2014-10-17	2015-10-23
15	Milan	Italy	+45°28'42.7", 09°13'49.8"	2014-10-30	2015-11-03
16	Venice	Italy	+45°29'13.1", 12°13'20.6"	2014-10-28	2015-11-05
21	Oslo	Norway	+59°55'11.2", 10°41'23.2"	2014-10-14	2015-10-15
23	Birkenes	Norway	+58°23'20.5", 08°15'04.5"	2014-10-22	2015-10-21
24	Stockholm	Sweden	+59°19'00.3", 18°03'24.2"	2014-10-22	2015-10-21
26	Aspvreten	Sweden	+58°48'24.0", 17°22'25.0"	2014-10-22	2015-10-21
31	Madrid	Spain	+40°27'26.5", -03°51'54.7"	2014-10-20	2015-10-28
33	Toledo	Spain	+39°32'31.8", -04°20'26.7"	2014-10-21	2015-10-28
35	Lahemaa	Estonia	+59°30'00" , 25°54'00"	2014-10-29	2015-10-28
40	Paris	France	+48°51'49.1", 02°20'40.4"	2014-10-14	2015-10-14
41	Berlin	Germany	+52°30'59.6", 13°17'02.1"	2014-10-14	2015-10-21
44	Svanvik	Norway	+69°27'18.5", 30°02'27.5"	2014-11-12	2015-11-12
45	Chaumont	Switzerland	+47°02'58.3", 06°58'45.2"	2014-10-13	2015-10-06
50	Katowice	Poland	+50°15'52.5", 18°58'30.3"	2014-10-28	2015-10-26
51	Athens	Greece	+37°59'17.6", 23°43'39.6"	2014-10-21	2015-10-23
52	Riga	Latvia	+56°56'49.7", 24°06'16.9"	2014-10-20	2015-10-26
53	Vienna	Austria	+48°14'56.0", 16°21'24.6"	2014-10-24	2015-10-21
55	St Petersburg	Russian Federation	+59°59'31.9", 30°21'4.6"	2014-12-03	2015-03-03
57	Hämeenlinna	Finland	+60°58'33.4", 24°32'02.5"	2014-10-30	2015-10-30
59	Žilina	Slovakia	+49°12'10.12",18°45'19.03"	2014-10-01	2015-09-30

Table B.4: Months included in the calculation of the annual averages

Site no	Year	Months included in annual average
1	14/15	Oct-Sep
3	14/15	Oct-Sep
10	14/15	Oct-Sep
13	14/15	Nov-Oct
14	14/15	Nov-Oct
15	14/15	Nov-Oct
16	14/15	Nov-Oct
21	14/15	Oct-Sep
23	14/15	Nov-Oct
24	14/15	Nov-Oct
26	14/15	Nov-Oct
31	14/15	Nov-Oct
33	14/15	Nov-Oct
35	14/15	Nov-Oct
40	14/15	Oct-Sep
41	14/15	Oct-Oct
44	14/15	Nov-Oct
45	14/15	Oct-Sep
50	14/15	Nov-Oct
51	14/15	Nov-Oct
53	14/15	Nov-Oct
55	14/15	Des-Feb
57	14/15	Nov-Oct
59	14/15	Oct-Sep

Appendix C

Tri-monthly mean values for passive gas sampling and particle deposition on IVL samplers in a position sheltered from rain.

Table C.1: Particle deposition on IVL passive samplers sheltered from rain. Tri-monthly samples (µg cm^{-2} $month^{-1}$).

station	start	stop	Start time	End time	days	mass	Cl^-	NO_3^-	SO_4^{2-}	NH_4^+	Ca^{2+}	Mg^{2+}	Na^+	K^+	note
						µg cm^{-2} $month^{-1}$									
ICP - 1 Prague	04.10.2014	02.01.2015	04.10.2014 12:00	02.01.2015 12:00	90	7									
ICP - 1 Prague	02.01.2015	02.04.2015	02.01.2015 12:00	02.04.2015 12:00	90	5									
ICP - 1 Prague	02.04.2015	30.06.2015	02.04.2015 12:00	30.06.2015 12:00	89	7									
ICP - 1 Prague	30.06.2015	10.10.2015	30.06.2015 12:00	10.10.2015 12:00	102	6									
ICP - 3 Kopisty	03.10.2014	06.01.2015	03.10.2014 12:00	06.01.2015 12:00	95	12									
ICP - 3 Kopisty	06.01.2015	07.04.2015	06.01.2015 12:00	07.04.2015 12:00	91	7									
ICP - 3 Kopisty	07.04.2015	30.06.2015	07.04.2015 12:00	30.06.2015 12:00	84	13									
ICP - 3 Kopisty	30.06.2015	09.10.2015	30.06.2015 12:00	09.10.2015 12:00	101	12									
ICP - 10 Bottrop	01.10.2014	07.01.2015	01.10.2014 09:45	07.01.2015 07:20	98	8									
ICP - 10 Bottrop	01.10.2014	07.01.2015			98	5	0.03	0.28	0.24	0.03	0.06	<0.011	<0.02	<0.02	Sheltered position
ICP - 10 Bottrop	07.01.2015	01.04.2015	07.01.2015 07:20	01.04.2015 07:30	84	15									
ICP - 10 Bottrop	07.01.2015	01.04.2015			84	6									Sheltered position
ICP - 10 Bottrop	01.04.2015	24.06.2015	01.04.2015 07:30	24.06.2015 13:40	84	21									
ICP - 10 Bottrop	01.04.2015	24.06.2015			84	8									Sheltered position
ICP - 10 Bottrop	24.06.2015	14.10.2015	24.06.2015 13:41	14.10.2015 07:35	112	8									
ICP - 10 Bottrop	24.06.2015	14.10.2015			112	6									Sheltered position
ICP - 13 Rome	21.10.2014	28.01.2015	21.10.2014 11:10	28.01.2015 11:30	99	14									
ICP - 13 Rome	28.01.2015	28.04.2015	28.01.2015 11:30	28.04.2015 11:00	90	20									
ICP - 13 Rome	28.04.2015	28.07.2015	28.04.2015 11:00	28.07.2015 10:00	91	38									
ICP - 13 Rome	28.07.2015	27.10.2015	28.07.2015 10:15	27.10.2015 12:00	91	17									
ICP - 14 Casaccia	17.10.2014	16.01.2015	17.10.2014 11:00	16.01.2015 14:00	91	17									
ICP - 14 Casaccia	16.01.2015	20.04.2015	16.01.2015 14:00	20.04.2015 11:00	94	17									
ICP - 14 Casaccia	20.04.2015	23.07.2015	20.04.2015 11:00	23.07.2015 10:00	94	31									
ICP - 14 Casaccia	23.07.2015	23.10.2015	23.07.2015 10:10	23.10.2015 11:00	92	25									
ICP - 15 Milan	30.10.2014	29.01.2015	30.10.2014 10:45	29.01.2015 11:20	91	11									
ICP - 15 Milan	29.01.2015	29.04.2015	29.01.2015 11:20	29.04.2015 11:00	90	23									
ICP - 15 Milan	29.04.2015	28.07.2015	29.04.2015 11:00	28.07.2015 09:00	90	28									
ICP - 15 Milan	28.07.2015	03.11.2015	28.07.2015 09:00	03.11.2015 10:30	98	17									
ICP - 16 Venice	28.10.2014	23.01.2015	28.10.2014 11:15	23.01.2015 10:20	87	12									
ICP - 16 Venice	23.01.2015	23.04.2015	23.01.2015 10:30	23.04.2015 09:40	90	10									
ICP - 16 Venice	23.04.2015	28.07.2015	23.04.2015 09:50	28.07.2015 12:10	96	8									
ICP - 16 Venice	28.07.2015	05.11.2015	28.07.2015 12:20	05.11.2015 11:00	100	6									
ICP - 21 Oslo	14.10.2014	14.01.2015	14.10.2014 13:30	14.01.2015 14:00	92	11									
ICP - 21 Oslo	14.01.2015	14.04.2015	14.01.2015 14:00	14.04.2015 14:00	90	15									
ICP - 21 Oslo	14.04.2015	14.07.2015	14.04.2015 14:00	14.07.2015 14:00	91	12									
ICP - 21 Oslo	14.07.2015	15.10.2015	14.07.2015 14:00	15.10.2015 14:00	93	9									

station	start	stop	Start time	End time	days	mass	Cl^-	NO_3^-	SO_4^{2-}	NH_4^+	Ca^{2+}	Mg^{2+}	Na^+	K^+	note
						$\mu g\ cm^{-2}\ month^{-1}$									
ICP - 23 Birkenes	22.10.2014	22.01.2015	22.10.2014 14:15	22.01.2015 07:00	92	2									
ICP - 23 Birkenes	22.01.2015	22.04.2015	22.01.2015 07:00	22.04.2015 16:00	90	3									
ICP - 23 Birkenes	22.04.2015	21.07.2015	22.04.2015 16:00	21.07.2015 06:00	90	13									
ICP - 23 Birkenes	21.07.2015	21.10.2015	21.07.2015 07:00	21.10.2015 14:00	92	7									
ICP - 24 Stockholm, Söder	22.10.2014	02.02.2015	22.10.2014 12:00	02.02.2015 12:00	103	11									
ICP - 24 Stockholm, Söder	02.02.2015	20.05.2015	02.02.2015 12:00	20.05.2015 12:00	107	34									
ICP - 24 Stockholm, Söder	20.05.2015	11.08.2015	20.05.2015 12:00	11.08.2015 12:00	83	19									
ICP - 24 Stockholm, Söder	11.08.2015	21.10.2015	11.08.2015 12:00	21.10.2015 12:00	71	17									
ICP - 26 Aspvreten	22.10.2014	03.02.2015	22.10.2014 12:00	03.02.2015 12:00	104	2									
ICP - 26 Aspvreten	03.02.2015	20.05.2015	03.02.2015 12:00	20.05.2015 12:00	106	4									
ICP - 26 Aspvreten	20.05.2015	13.08.2015	20.05.2015 12:00	13.08.2015 12:00	85	6									
ICP - 26 Aspvreten	13.08.2015	21.10.2015	13.08.2015 12:00	21.10.2015 12:00	69	3									
ICP - 31 Madrid	20.10.2014	27.01.2015	20.10.2014 12:00	27.01.2015 12:00	99	6									
ICP - 31 Madrid	27.01.2015	07.05.2015	27.01.2015 12:00	07.05.2015 12:00	100	18									
ICP - 31 Madrid	07.05.2015	29.07.2015	07.05.2015 12:00	29.07.2015 12:00	83	19									
ICP - 31 Madrid	29.07.2015	28.10.2015	29.07.2015 12:00	28.10.2015 12:00	91	8									
ICP - 33 Toledo	21.10.2014	28.01.2015	21.10.2014 12:00	28.01.2015 12:00	99	3									
ICP - 33 Toledo	28.01.2015	08.05.2015	28.01.2015 12:00	08.05.2015 12:00	100	12									
ICP - 33 Toledo	08.05.2015	29.07.2015	08.05.2015 12:00	29.07.2015 12:00	82	7									
ICP - 33 Toledo	29.07.2015	28.10.2015	29.07.2015 12:00	28.10.2015 12:00	91	9									
ICP - 35 Lahemaa	29.10.2014	15.01.2015	29.10.2014 12:00	15.01.2015 12:00	78	1									
ICP - 35 Lahemaa	15.01.2015	18.03.2015	15.01.2015 12:00	18.03.2015 16:00	62	4									
ICP - 35 Lahemaa	18.03.2015	07.07.2015	18.03.2015 16:00	07.07.2015 16:30	111	5									
ICP - 35 Lahemaa	07.07.2015	28.10.2015	07.07.2015 16:30	28.10.2015 11:15	113	8									
ICP - 40 Paris	14.10.2014	14.01.2015	14.10.2014 11:30	14.01.2015 17:00	92	8									
ICP - 40 Paris	14.01.2015	04.04.2015	14.01.2015 17:00	04.04.2015 15:00	80	7									
ICP - 40 Paris	04.04.2015	15.07.2015	04.04.2015 15:00	15.07.2015 09:45	102	11									
ICP - 40 Paris	15.07.2015	14.10.2015	15.07.2015 09:45	14.10.2015 14:00	91	10									The sampler had fallen to the ground
ICP - 41 Berlin	14.10.2014	15.01.2015	14.10.2014 16:10	15.01.2015 13:00	93	20									
ICP - 41 Berlin	28.10.2014	15.01.2015			79	41									sheltered position
ICP - 41 Berlin	15.01.2015	15.04.2015	15.01.2015 13:00	15.04.2015 12:00	90	111									unstable weight
ICP - 41 Berlin	15.01.2015	15.04.2015			90	85									sheltered position
ICP - 41 Berlin	15.04.2015	16.07.2015	15.04.2015 12:00	16.07.2015 10:45	92	29									
ICP - 41 Berlin	15.04.2015	16.07.2015			92	19									sheltered position
ICP - 41 Berlin	16.07.2015	21.10.2015	16.07.2015 10:45	21.10.2015 12:00	97	17									
ICP - 41 Berlin	16.07.2015	21.10.2015			97	15									sheltered position

						µg cm^{-2} month^{-1}									
station	start	stop	Start time	End time	days	mass	Cl^-	NO_3^-	SO_4^{2-}	NH_4^+	Ca^{2+}	Mg^{2+}	Na^+	K^+	note
ICP - 44 Svanvik	12.11.2014	01.02.2015	12.11.2014 13:10	01.02.2015 11:15	81	1									
ICP - 44 Svanvik	01.02.2015	01.05.2015	01.02.2015 11:15	01.05.2015 13:00	89	1									
ICP - 44 Svanvik	01.05.2015	01.08.2015	01.05.2015 13:00	01.08.2015 13:20	92	8									
ICP - 44 Svanvik	01.08.2015	12.11.2015	01.08.2015 13:20	12.11.2015 08:40	103	4									
ICP - 45 Chaumont	13.10.2014	12.01.2015	13.10.2014 10:00	12.01.2015 11:15	91	0	0.03	0.04	0.03	0.01	0.03	<0.012	0.02	0.02	
ICP - 45 Chaumont	12.01.2015	13.04.2015	12.01.2015 11:15	13.04.2015 11:15	91	1	0.01	0.05	0.03	<0.01	0.05	<0.006	0.01	<0.01	
ICP - 45 Chaumont	13.04.2015	10.07.2015	13.04.2015 11:15	10.07.2015 10:15	88	5	0.03	0.07	0.03	0.01	0.09	0.01	0.02	0.09	The sample was on the floor, only for a short while, according to the sampling protocol
ICP - 45 Chaumont	10.07.2015	06.10.2015	10.07.2015 10:15	06.10.2015 11:15	88	9	0.05	0.50	0.11	0.01	0.35	0.01	0.04	0.03	
ICP - 50 Katowice	28.10.2014	27.01.2015	28.10.2014 15:14	27.01.2015 13:55	91	19									
ICP - 50 Katowice	27.01.2015	29.04.2015	27.01.2015 14:00	29.04.2015 13:23	92	29									
ICP - 50 Katowice	29.04.2015	22.07.2015	29.04.2015 13:25	22.07.2015 11:12	84	16									
ICP - 50 Katowice	22.07.2015	26.10.2015	22.07.2015 11:14	26.10.2015 14:36	96	21									
ICP - 51 Athens	21.10.2014	21.01.2015	21.10.2014 12:50	21.01.2015 13:15	92	33	7.05	0.75	3.33	0.05	1.77	0.48	4.00	0.19	
ICP - 51 Athens	21.01.2015	21.04.2015	21.01.2015 13:15	21.04.2015 12:42	90	230	22.11	2.36	12.55	0.04	5.96	1.59	12.52	0.67	very dirty filter
ICP - 51 Athens	21.04.2015	21.07.2015	21.04.2015 12:42	21.07.2015 11:15	91	54	0.95	4.59	1.11	0.04	2.30	0.18	1.13	0.16	
ICP - 51 Athens	21.07.2015	23.10.2015	21.07.2015 11:19	23.10.2015 11:23	94	80	7.02	4.64	2.56		2.28	0.58	3.15	0.31	
ICP - 53 Vienna	24.10.2014	30.01.2015	24.10.2014 12:00	30.01.2015 10:00	98										
ICP - 53 Vienna	30.01.2015	17.04.2015	30.01.2015 10:00	17.04.2015 11:00	77										
ICP - 53 Vienna	17.04.2015	17.07.2015	17.04.2015 11:00	17.07.2015 08:00	91										
ICP - 53 Vienna	17.07.2015	21.10.2015	17.07.2015 08:00	21.10.2015 10:00	96										Construction work on the roof, perhaps influences measured particles.
ICP - 55 St Petersburg	03.12.2014	03.03.2015	03.12.2014 11:00	03.03.2015 12:00	90	27									
ICP - Hämeenlinna	30.10.2014	30.01.2015	30.10.2014 10:30	30.01.2015 10:45	92	4	0.25	0.28	0.15	0.01	0.07	0.02	0.22	0.03	
ICP - Hämeenlinna	30.01.2015	30.04.2015	30.01.2015 10:50	30.04.2015 11:30	90	16	0.09	0.17	0.29	0.02	0.16	0.02	0.12	<0.04	
ICP - Hämeenlinna	30.04.2015	28.07.2015	30.04.2015 11:45	28.07.2015 10:15	89	12	0.05	0.14	0.11	0.01	0.10	0.01	0.04	0.03	
ICP - Hämeenlinna	28.07.2015	30.10.2015	28.07.2015 10:15	30.10.2015 13:30	94	8	0.11	0.29	0.14	0.01	0.12	0.02	0.08	0.05	
ICP - Žilina	01.10.2014	07.01.2015	01.10.2014 08:00	07.01.2015 08:30	98	7	0.09	0.22	0.40	0.02	0.33	0.02	0.06	0.03	
ICP - Žilina	07.01.2015	01.04.2015	07.01.2015 08:30	01.04.2015 08:30	84	9	0.04	0.29	0.47	0.04	0.42	0.02	0.05	<0.03	
ICP - Žilina	01.04.2015	02.07.2015	01.04.2015 08:30	02.07.2015 08:15	92	16	0.05	0.43	0.35	0.02	0.53	0.03	0.02	0.05	
ICP - Žilina	02.07.2015	30.09.2015	02.07.2015 08:15	30.09.2015 08:30	90	15	0.10	0.82	0.55	0.01	1.14	0.03	0.03	0.04	

Table C.2: Gas concentration measurements with IVL passive samplers sheltered from rain. Tri-monthly samples (µg/m^3)

Station	Start time	End time	Days	Temp C	NO_2 µg/m^3 STP	NH_3 µg/m^3 STP	HNO_3 µg/m^3 STP	O_3 µg/m^3 STP	SO_2 µg/m^3 STP	HCOOH µg/m^3 STP	CH_3COOH µg/m^3 STP	Remarks
ICP - 1 Prague	04.10.2014 12:00	02.01.2015 12:00	90	5	-	-	0.34	-	-	-	-	
ICP - 1 Prague	02.01.2015 12:00	02.04.2015 12:00	90	-1	-	-	0.50	-	-	-	-	
ICP - 1 Prague	02.04.2015 12:00	30.06.2015 12:00	89	11	-	-	1.1	-	-	-	-	
ICP - 1 Prague	30.06.2015 12:00	10.10.2015 12:00	102	17	-	-	1.16	-	-	-	-	
ICP - 3 Kopisty	03.10.2014 12:00	06.01.2015 12:00	95	4	-	-	0.27	-	-	-	-	
ICP - 3 Kopisty	06.01.2015 12:00	07.04.2015 12:00	91	-1	-	-	0.26	-	-	-	-	
ICP - 3 Kopisty	07.04.2015 12:00	30.06.2015 12:00	84	13	-	-	0.64	-	-	-	-	
ICP - 3 Kopisty	30.06.2015 12:00	09.10.2015 12:00	101	17	-	-	0.58	-	-	-	-	
ICP - 10 Bottrop	01.10.2014 09:45	07.01.2015 07:20	98	7	-	-	0.34	-	-	-	-	
ICP - 10 Bottrop	07.01.2015 07:20	01.04.2015 07:30	84	4	-	-	0.31	-	-	-	-	
ICP - 10 Bottrop	01.04.2015 07:30	24.06.2015 13:40	84	14	-	-	0.54	-	-	-	-	
ICP - 10 Bottrop	24.06.2015 13:41	14.10.2015 07:35	112	10	-	-	0.78	-	-	-	-	Ants in the vial, spider on the sampler
ICP - 13 Rome	21.10.2014 11:10	28.01.2015 11:30	99	11	-	-	0.31	-	-	-	-	
ICP - 13 Rome	28.01.2015 11:30	28.04.2015 11:00	90	11	-	-	0.38	-	-	-	-	
ICP - 13 Rome	28.04.2015 11:00	28.07.2015 10:00	91	21	-	-	2.34	-	-	-	-	
ICP - 13 Rome	28.07.2015 10:15	27.10.2015 12:00	91	21	-	-	1.08	-	-	-	-	
ICP - 14 Casaccia	17.10.2014 11:00	16.01.2015 14:00	91	12	-	-	0.23	-	-	-	-	
ICP - 14 Casaccia	16.01.2015 14:00	20.04.2015 11:00	94	9	-	-	0.23	-	-	-	-	
ICP - 14 Casaccia	20.04.2015 11:00	23.07.2015 10:00	94	21	-	-	0.83	-	-	-	-	
ICP - 14 Casaccia	23.07.2015 10:10	23.10.2015 11:00	92	20	-	-	0.50	-	-	-	-	
ICP - 15 Milan	30.10.2014 10:45	29.01.2015 11:20	91	2	-	-	0.29	-	-	-	-	
ICP - 15 Milan	29.01.2015 11:20	29.04.2015 11:00	90	7	-	-	0.70	-	-	-	-	
ICP - 15 Milan	29.04.2015 11:00	28.07.2015 09:00	90	19	-	-	3.17	-	-	-	-	
ICP - 15 Milan	28.07.2015 09:00	03.11.2015 10:30	98	18	-	-	1.42	-	-	-	-	

Station	Start time	End time	Days	Temp C	NO_2 µg/m³ STP	NH_3 µg/m³ STP	HNO_3 µg/m³ STP	O_3 µg/m³ STP	SO_2 µg/m³ STP	HCOOH µg/m³ STP	CH_3COOH µg/m³ STP	Remarks
ICP - 16 Venice	28.10.2014 11:15	23.01.2015 10:20	87	3	-	-	0.24	-	-	-	-	
ICP - 16 Venice	23.01.2015 10:30	23.04.2015 09:40	90	8	-	-	0.62	-	-	-	-	
ICP - 16 Venice	23.04.2015 09:50	28.07.2015 12:10	96	20	-	-	2.73	-	-	-	-	
ICP - 16 Venice	28.07.2015 12:20	05.11.2015 11:00	100	18	-	-	1.18	-	-	-	-	
ICP - 21 Oslo	14.10.2014 13:30	14.01.2015 14:00	92	2	-	-	0.10	24	-	-	-	
ICP - 21 Oslo	14.01.2015 14:00	14.04.2015 14:00	90	1	-	-	0.11	40	-	-	-	
ICP - 21 Oslo	14.04.2015 14:00	14.07.2015 14:00	91	11	-	-	0.24	68	-	-	-	
ICP - 21 Oslo	14.07.2015 14:00	15.10.2015 14:00	93	16.1	-	-	0.17	35	-	-	-	
ICP - 23 Birkenes	22.10.2014 14:15	22.01.2015 07:00	92	4	-	-	0.04	46	-	-	-	
ICP - 23 Birkenes	22.01.2015 07:00	22.04.2015 16:00	90	1	-	-	0.09	64	-	-	-	
ICP - 23 Birkenes	22.04.2015 16:00	21.07.2015 06:00	90	11	-	-	0.02	65	-	-	-	HNO3: <0.03
ICP - 23 Birkenes	21.07.2015 07:00	21.10.2015 14:00	92	11.4	-	-	0.09	47	-	-	-	
ICP - 24 Stockholm, Söder	22.10.2014 12:00	02.02.2015 12:00	103	-1	13.4	-	0.28	44	0.8	-	-	
ICP - 24 Stockholm, Söder	02.02.2015 12:00	20.05.2015 12:00	107	0	8.7	-	0.27	64	0.4	-	-	
ICP - 24 Stockholm, Söder	20.05.2015 12:00	11.08.2015 12:00	83	17	4.3	-	0.69	134	0.3	-	-	Inlet lost on O_3 sampler. Unreliabel result
ICP - 24 Stockholm, Söder	11.08.2015 12:00	21.10.2015 12:00	71	11.9	13.7	-	0.4	56	0.4	-	-	
ICP - 26 Aspvreten	22.10.2014 12:00	03.02.2015 12:00	104	-1	1.9	-	0.10	44	0.5	-	-	
ICP - 26 Aspvreten	03.02.2015 12:00	20.05.2015 12:00	106	0	1.7	-	0.08	58	0.3	-	-	
ICP - 26 Aspvreten	20.05.2015 12:00	13.08.2015 12:00	85	17	0.8	-	0.06	52	0.3	-	-	
ICP - 26 Aspvreten	13.08.2015 12:00	21.10.2015 12:00	69	11.9	1.0	-	0.04	40	0.2	-	-	
ICP - 31 Madrid	20.10.2014 12:00	27.01.2015 12:00	99	7	-	-	0.45	-	-	-	-	
ICP - 31 Madrid	27.01.2015 12:00	07.05.2015 12:00	100	10	-	-	0.67	-	-	-	-	
ICP - 31 Madrid	07.05.2015 12:00	29.07.2015 12:00	83	21	-	-	1.83	-	-	-	-	
ICP - 31 Madrid	29.07.2015 12:00	28.10.2015 12:00	91	20	-	-	1.01	-	-	-	-	
ICP - 33 Toledo	21.10.2014 12:00	28.01.2015 12:00	99	8	-	-	0.23	-	-	-	-	
ICP - 33 Toledo	28.01.2015 12:00	08.05.2015 12:00	100	11	-	-	0.25	-	-	-	-	
ICP - 33 Toledo	08.05.2015 12:00	29.07.2015 12:00	82	22	-	-	0.69	-	-	-	-	
ICP - 33 Toledo	29.07.2015 12:00	28.10.2015 12:00	91	21	-	-	0.47	-	-	-	-	

Station	Start time	End time	Days	Temp C	NO_2 µg/m³ STP	NH_3 µg/m³ STP	HNO_3 µg/m³ STP	O_3 µg/m³ STP	SO_2 µg/m³ STP	HCOOH µg/m³ STP	CH_3COOH µg/m³ STP	Remarks
ICP - 35 Lahemaa	29.10.2014 12:00	15.01.2015 12:00	78	5	-	-	0.20	-	-	-	-	
ICP - 35 Lahemaa	15.01.2015 12:00	18.03.2015 16:00	62	6	-	-	0.35	-	-	-	-	
ICP - 35 Lahemaa	18.03.2015 16:00	07.07.2015 16:30	111	11	-	-	0.18	-	-	-	-	
ICP - 35 Lahemaa	07.07.2015 16:30	28.10.2015 11:15	113	12	-	-	0.13	-	-	-	-	
ICP - 40 Paris	14.10.2014 11:30	14.01.2015 17:00	92	10	32.7	-	0.26	30	1.0	-	-	
ICP - 40 Paris	14.01.2015 17:00	04.04.2015 15:00	80	6	35.3	-	0.30	36	2.3	-	-	
ICP - 40 Paris	04.04.2015 15:00	15.07.2015 09:45	102	15	12.2	-	1.12	61	0.6	-	-	
ICP - 40 Paris	15.07.2015 09:45	14.10.2015 14:00	91	15	15.8	-	0.80	52	0.7	-	-	
ICP - 41 Berlin	14.10.2014 16:10	15.01.2015 13:00	93	6	-	-	0.15	-	-	-	-	
ICP - 41 Berlin	15.01.2015 13:00	15.04.2015 12:00	90	4	-	-	0.18	-	-	-	-	
ICP - 41 Berlin	15.04.2015 12:00	16.07.2015 10:45	92	24	-	-	0.42	-	-	-	-	
ICP - 41 Berlin	16.07.2015 10:45	21.10.2015 12:00	97	18	-	-	0.55	-	-	-	-	
ICP - 44 Svanvik	12.11.2014 13:10	01.02.2015 11:15	81	5	-	-	0.08	53	-	-	-	
ICP - 44 Svanvik	01.02.2015 11:15	01.05.2015 13:00	89	-8	-	-	0.08	78	-	-	-	
ICP - 44 Svanvik	01.05.2015 13:00	01.08.2015 13:20	92	8	-	-	0.05	60	-	-	-	
ICP - 44 Svanvik	01.08.2015 13:20	12.11.2015 08:40	103	7	-	-	0.03	56	-	-	-	
ICP - 45 Chaumont	13.10.2014 10:00	12.01.2015 11:15	91	3	3.3	0.7	0.19	58	0.4	0.5	0.3	CH3COOH: <0.5
ICP - 45 Chaumont	12.01.2015 11:15	13.04.2015 11:15	91	-1	2.3	1.05	0.37	78	0.4	1.5	1.8	
ICP - 45 Chaumont	13.04.2015 11:15	10.07.2015 10:15	88	9	1.5	1.7	0.51	98	0.6	1.4	0.7	
ICP - 45 Chaumont	10.07.2015 10:15	06.10.2015 11:15	88	15	1.7	1.5	0.55	90	0.4	1.3	0.3	CH3COOH: <0.5
ICP - 50 Katowice	28.10.2014 15:14	27.01.2015 13:55	91	0	-	-	0.59	-	-	-	-	
ICP - 50 Katowice	27.01.2015 14:00	29.04.2015 13:23	92	3	-	-	0.62	-	-	-	-	
ICP - 50 Katowice	29.04.2015 13:25	22.07.2015 11:12	84	16	-	-	0.68	-	-	-	-	
ICP - 50 Katowice	22.07.2015 11:14	26.10.2015 14:36	96	13	-	-	1.02	-	-	-	-	
ICP - 51 Athens	21.10.2014 12:50	21.01.2015 13:15	92	13	-	5.6	0.23	-	-	-	-	
ICP - 51 Athens	21.01.2015 13:15	21.04.2015 12:42	90	13	-	3.4	0.19	-	-	-	-	
ICP - 51 Athens	21.04.2015 12:42	21.07.2015 11:15	91	25	-	3.7	1.82	-	-	-	-	
ICP - 51 Athens	21.07.2015 11:19	23.10.2015 11:23	94	24	-	4.0	1.76	-	-	-	-	

Station	Start time	End time	Days	Temp C	NO_2 µg/m³ STP	NH_3 µg/m³ STP	HNO_3 µg/m³ STP	O_3 µg/m³ STP	SO_2 µg/m³ STP	HCOOH µg/m³ STP	CH_3COOH µg/m³ STP	Remarks
ICP - 53 Vienna	24.10.2014 12:00	30.01.2015 10:00	98	2	-	-	0.32	-	-	-	-	
ICP - 53 Vienna	30.01.2015 10:00	17.04.2015 11:00	77	6	-	-	0.56	-	-	-	-	
ICP - 53 Vienna	17.04.2015 11:00	17.07.2015 08:00	91	19	-	-	0.96	-	-	-	-	
ICP - 53 Vienna	17.07.2015 08:00	21.10.2015 10:00	96	15	-	-	1.00	-	-	-	-	
ICP - 55 St Petersburg	03.12.2014 11:00	03.03.2015 12:00	90	-7	-	-	0.13	29	3.6	-	-	
ICP - Hämeenlinna	30.10.2014 10:30	30.01.2015 10:45	92	1	9.4	0.3	0.50	41	1.1	-	-	HNO3 started 2014-11-05 10:30
ICP - Hämeenlinna	30.01.2015 10:50	30.04.2015 11:30	90	-3	8.2	0.1	0.37	61	0.9	-	-	NH3: <0.2
ICP - Hämeenlinna	30.04.2015 11:45	28.07.2015 10:15	89	17	3.9	0.3	0.26	58	0.5	-	-	
ICP - Hämeenlinna	28.07.2015 10:15	30.10.2015 13:30	94	1	6.6	0.6	0.2	48	0.5	-	-	
ICP - Žilina	01.10.2014 08:00	07.01.2015 08:30	98	4	-	-	0.30	-	-	-	-	
ICP - Žilina	07.01.2015 08:30	01.04.2015 08:30	84	4	-	-	0.37	-	-	-	-	
ICP - Žilina	01.04.2015 08:30	02.07.2015 08:15	92	15	-	-	0.58	-	-	-	-	
ICP - Žilina	02.07.2015 08:15	30.09.2015 08:30	90	13	-	-	0.71	-	-	-	-	

Appendix D

Annual average values for particle deposition (per month) and for concentrations of NO_2, NH_3, HNO_3, O_3 SO_2, HCOOH, CH_3COOH, HCl and HF (pr. year) measured with IVL samplers for the exposure period.

Table D.1: Annual average particle deposition (per month - sheltered from rain)

Station	Year	mass	Cl^-	NO_3^-	SO_4^{2-}	NH_4^+	Ca^{2+}	Mg^{2+}	Na^+	K^+
		µg cm^{-2} $month^{-1}$								
01	14/15	6.0								
03	14/15	11.1								
10	14/15	12.3	0.03	0.28	0.24	0.03	0.06	<0.011	<0.02	<0.02
13	14/15	22.3								
14	14/15	22.8								
15	14/15	19.4								
16	14/15	9.0								
21	14/15	11.6								
23	14/15	6.3								
24	14/15	20.8								
26	14/15	3.8								
31	14/15	12.8								
33	14/15	7.5								
35	14/15	5.1								
40	14/15	9.4								
41	14/15	43.5								
44	14/15	3.5								
45	14/15	3.7	0.03	0.16	0.05	0.01	0.13	0.01	0.02	0.04
50	14/15	21.3								
51	14/15	98.3	9.22	3.09	4.84	0.04[1]	3.06	0.70	5.16	0.33
53	14/15	0.0								
55	14/15	14.8								
57	14/15	10.0	0.13	0.22	0.17	0.01	0.11	0.02	0.12	0.03
59	14/15	11.8	0.07	0.44	0.44	0.02	0.60	0.03	0.04	0.03

[1] Data for three first periods (9 months). See Table A.1.

Grey marked cells, station 10: Data only for first period (3 months – see Table A.1), from position sheltered from both rain and wind (i.e. inside shelter)

Table D.2: Annual average concentration of gases (µg m^{-3})

Station	Year	T	NO_2	NH_3	HNO_3	O_3	SO_2	HCOOH	CH_3COOH
		°C	µg/m^3						
01	14/15	8.2			0.79				
03	14/15	8.1			0.44				
10	14/15	8.6			0.51				
13	14/15	15.5			1.01				
14	14/15	15.4			0.45				
15	14/15	11.5			1.39				
16	14/15	12.6			1.22				
21	14/15	7.3			0.15	41.5			
23	14/15	6.8			0.06	55.4			
24	14/15	6.0	10.0		0.39	54.9	0.5		
26	14/15	6.0	1.4		0.07	49.3	0.3		
31	14/15	13.9			0.95				
33	14/15	15.1			0.40				
35	14/15	9.3			0.20				
40	14/15	11.9	23.3		0.64	45.4	1.1		
41	14/15	12.7			0.33				
44	14/15	3.0			0.06	61.7			
45	14/15	6.5	2.2	1.2	0.40	80.9	0.5	1.2	0.8
50	14/15	7.9			0.73				
51	14/15	18.6		4.2	1.01				
53	14/15	10.4			0.71				
55	14/15	-7.1			0.13	28.6	3.6		
57	14/15	4.0	7.1	0.3	0.33	51.9	0.7		
59	14/15	9.0			0.49				

Grey marked cells, station 55: Data only for first period (3 months – see Table A.1)

Appendix E

Data availability

Table E.1: Data availability in % for the months of exposure (Table B.4).

	Mandatory									Optional			
	Climate		Gases (concentration)				Precipitation			Prec.			Particles
Station no	Temp	RH	SO_2	NO_2	O_3	HNO3	Amount	H+	Cl-	Cond.	SO42-	NO3-	PM10 (Conc)
	availability (%)												
01	100	100	100	100	100	A	100	100	100	92	75	100	100
03	100	100	100	100	100	A	100	92	100	83	100	100	100
10	99	99	94	95	91	A	100	100	100	100	100	100	A
13	100	100	99	99	99	A	100	0	0	0	0	0	98
14	100	100	99	98	99	A	100	92	0	0	0	0	97
15	100	99	99	97	100	A	100	0	0	0	0	0	98
16	100	100	100	67	100	A	100	0	0	0	0	0	0
21	100	100	92	92	A	A	100	100	100	100	100	100	0
23	100	100	99	100	99/A	96/A	100	99	99	99	99	99	92
24	100	100	100	99	100	A	100	100	100	0	0	0	91
26	99	59	100	100	83	A	A	92	92	0	92	92	75
31	100	100	100	100	100	A	100	100	100	100	100	100	100
33	99	99	98	98	98	A	100	100	89	100	89	89	99
35	100	100	100	99	100	A	34	34	34	34	34	34	100
40	100	100	A	A	A	A	100	100	A	100	100	100	0
41	100	100	99	99	100	A	A	A	0	0	0	0	99
44	100	100	97	100	A	A	99	90	100	90	100	100	84
45	99	99	A	98/A	98/A	A	100	100	100	100	100	100	100
50	A	A	A	A	A	A	A	A	A	A	A	A	A
51	100	100	95	98	98	A	100	25[1]	0	0	0	0	94
53	A	A	100	100	100	A	A	0	0	0	0	0	97
55	0	0	A[2]	0	A[2]	A[2]	0	0	0	0	0	0	0
57	100	100	A	A	A	A	100	A[3]	A[3]	0	0	0	0
59	100	100	100	100	100	0	100	100	100	100	100	100	100

A = available: the % availability was not reported, or IVL data. [1]Data only for 3 (of 12) months. [2]Only IVL data available, for first period of 3 months. [3]Data obtained 35 km from site: "Lammi"- background in woods (Hämeenlinna have possible spot source from factory).

Appendix F

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