



Guidance for the Comprehensive Atmospheric Monitoring Programme (CAMP)

(Agreement 2015-04)¹

In this document there are no details on the draft Guidance for the CAMP. Therefore EMEP-websites are frequently referred to. Sometimes the website links have been replaced with a successor of this website.

Background

This CAMP Guidance document has been developed so that there are commonly agreed methodologies that Contracting Parties commit to use in order to make regular regionally-agreed assessments of the atmospheric inputs of specified substances to the OSPAR maritime area.

1. Objectives

The main objectives of the CAMP are to monitor the concentrations of selected pollutants (nitrogen and specified hazardous substances) in precipitation and air, and their depositions in order to:

- a. periodically assess the atmospheric input of the selected pollutants to the maritime area and regions thereof by both monitoring and modelling;
- b. efficiently maintain data that allow for an assessment of long-term trends in total annual deposition of pollutants;
- c. assess the long-term trends of this atmospheric input.

2. The network

Each Contracting Party bordering the maritime area (EU excluded) should have at least one monitoring station on the coast and/or offshore to be included in the joint monitoring programme. Contracting Parties that border more than one OSPAR Region should have at least one monitoring station on the coast and/or offshore within each region. The station should be a so-called *background station*, that is, a station that is not directly influenced by local sources. The station should be located preferably not more than 10 km from the coastline and represent the coastal deposition. It is recommended that the air and precipitation measurements are co-located at the CAMP sites. The CAMP measurements are submitted and publically available at the international database EBAS (Database for Atmospheric Composition Research) hosted at NILU: <http://ebas.nilu.no/>. Information on the monitoring stations can be found at <http://www.nilu.no/projects/ccc/sitedescriptions/>.

¹ Replaces Agreement 2001-7

3. Relevant components in precipitation and ambient air and aerosol

3.1.a. Components to be measured in precipitation

The following components are to be measured on a mandatory basis every year:

- a. the nutrients (ammonium - NH_4^+ and nitrate - NO_3^-)
- b. the priority heavy metals cadmium, lead, total mercury and nickel
- c. the parameters needed for the ion balance quality check as measured on a mandatory basis every year (to report pH, electrical conductivity and the concentrations in precipitation of the major ions (Na^+ , K^+ , Ca^{2+} , Mg^{2+} , SO_4^{2-} , Cl^- , NH_4^+ , NO_3^-))

and also every year on a voluntary basis:

- d. arsenic, chromium, copper, zinc and PAHs.

3.1.b. Components to be measured in ambient air and aerosol

The following components are to be measured on a mandatory basis every year:

- a. in gaseous phase: NO_2 , HNO_3 , NH_3 ,
- b. in aerosol phase: ammonium (NH_4^+) and nitrate (NO_3^-),
- c. in aerosol phase: cadmium, lead, and nickel,

and also every year on voluntary basis

- d. in gaseous phase: mercury (total gaseous mercury),
- e. in aerosol phase: PCBs.

3.2. Sampling, frequency and analysing methods for measurements in precipitation, ambient air and aerosol

For the field and laboratory methods and the sampling frequency the recommendation is to follow the EMEP guidelines given in the manual at <http://www.nilu.no/projects/ccc/manual/index.html>. The sampling frequency in the EMEP networks should be daily or weekly. In CAMP it is possible to have bi-weekly sampling, for voluntary PCB measurements reporting of monthly values is accepted.

The information, including background documents needed, can be found at the website of EMEP at <http://www.nilu.no/projects/ccc/manual/index.html>.

4. Quality assurance

For the CAMP quality assurance the recommendation is to refer to the procedures within the QA/QC programme of EMEP. Information regarding the procedures for quality assurance of EMEP for precipitation, for air and for aerosol can be found at <http://www.nilu.no/projects/ccc/qa/index.htm>.

5. Reporting Procedures

Information regarding the reporting procedures for CAMP can be found at <http://ebas-submit.nilu.no/>.

6. Methodology for assessment of atmospheric inputs

For OSPAR the combination of both model load calculations and the trends measured at the coastal stations is optimal. On the EMEP website the calculated loads for nitrogen, lead, cadmium and mercury and a few persistent organic pollutants (POPs) are reported annually. There is some time delay between collecting and reporting the deposition data (around two years).

EMEP uses advanced models in which the wet and dry deposition of pollutants is calculated for OSPAR Region II. The outcome of these models gives information on the deposition as well as the relevance of different

emission sources to the atmosphere. Furthermore, these models give the opportunity to analyse scenarios. Emissions of substances into the atmosphere are used as input in these EMEP models.

The information on the methods for calculation of long-term averaged concentrations for the assessments of atmospheric inputs can be found on both websites of EMEP at the Meteorological Synthesising Centre–West (MSC-W) for the nutrients and the Meteorological Synthesising Centre–East for the metals and POPs.

Nutrients

The information for the methods for assessment of atmospheric inputs of nutrients can be found on the website of the EMEP/MSC-W model at https://wiki.met.no/emep/page1/emepmscw_opensource. The reports on the calculation loads for the OSPAR Region II (North Sea) for nutrients can be found on an annual basis and downloaded from the Meteorological Synthesising Centre-West of EMEP at http://www.emep.int/mscw/index_mscw.html by selecting EMEP/MSC-W reports.

The results of the EMEP MSC-W modelled air concentrations and depositions can be retrieved with the data selections for North Sea (OSPAR Region II) for dry and wet deposition of oxidised and reduced nitrogen by selecting Downloadable Data at http://www.emep.int/mscw/index_mscw.html.

Metals and POPs

The information on the methods for assessment of atmospheric inputs of metals and POPs can be found on the website EMEP/MSC-E model for the metals at <http://www.msceast.org/index.php/msce-hm> and for the POPs at <http://www.msceast.org/index.php/msc-pop>. The reports of the calculation loads for the OSPAR Region II (North Sea) for metals and POPs can be found on an annual basis and downloaded from the Meteorological Synthesising Centre-East of EMEP (MSC-E of EMEP) at <http://www.msceast.org/index.php/reports>. The results of the EMEP MSC-E modelled air concentrations and depositions can be retrieved for metals and POPs for the North Sea (OSPAR Region II) at <http://www.msceast.org/index.php/marginal-seas#north>.

The annual updated reports for metals can be retrieved from http://www.msceast.org/reports/2_2014.pdf and for POPs from http://www.msceast.org/reports/3_2014.pdf.

Updated information also on atmospheric input of Heavy Metals (HM) and POPs to the marginal seas (the Baltic, North, Black, Mediterranean and Caspian Seas) is presented at <http://www.msceast.org/index.php/msc-pop>. This information includes spatial distribution of total annual deposition fluxes of Pb, Cd, Hg, PCDD/Fs, B[a]P, HCB and PCB-153 as well as the pie chart diagrams illustrating contributions of particular EMEP countries to the deposition over the seas. Modelling of HM and POP long-range transport and deposition was performed using the latest version of MSCE-HM and MSCE-POP models and the latest available officially submitted emission data.

7. Data management, presentation of results and reports OSPAR

In CAMP nutrients, mercury, lead and cadmium should be reported on an annual basis as a common indicator. The information on the data management can be found on the EBAS website at <http://ebas-submit.nilu.no/>. The presentation of results of direct measurements can also be found on the EBAS website at <http://ebas.nilu.no/>. The most recent results for the last years can also be found in the common status reports of EMEP at the general webpage with EMEP reports (http://www.emep.int/emep_publications.html).