



OSPAR Coordinated Environmental Monitoring Programme (CEMP)

(Reference number: 2010-1, amended in 2011, 2012, 2013, 2014)¹

The CEMP is currently under review. OSPAR 2015 agreed text for ANNEX 1 PART A: Guidance to Contracting Parties wishing to present a case for opting out of elements of the Coordinated Environmental Monitoring (and Assessment) Programme (CEMAP) (OSPAR 15/20/1, Annex 12)

The Environmental Impacts of Human Activities Committee (EIHA) 2015 agreed on CEMP appendices for:

- Beach Litter: Trends in amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source (EIHA 15/10/1, Annex 13)
- Fulmar: Monitoring plastic particles in stomachs of seabirds (EIHA 15/10/1, Annex 14)
- Seabed Litter: Marine litter on the seafloor (EIHA 15/10/1, Annex 16)

The revised opt-out text and appendices will be added to the Programme when the structure has been revised over the course of the coming year.

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¹ 2011: amendments to Appendix 1, 3, 4, 8, 9, 10, 11, 12, 13, 14;

2012: addition of Appendix 16;

2013: revision s main text

2014: revisions to paragraphs 7, 8, 19 and Appendix 16

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OSPAR Coordinated Environmental Monitoring Programme (CEMP)

(Reference number: 2010-1)

1. Introduction

1. The Coordinated Environmental Monitoring Programme (CEMP) is that part of the monitoring within the JAMP where the national contributions overlap and are co-ordinated. The aim of the CEMP is to deliver comparable data from across the OSPAR maritime area, which can be used in assessments to address the specific questions raised in the JAMP.

2. Three requirements are essential for the realisation of the CEMP. These are:

- guidelines;
- quality assurance tools;
- assessment tools.

3. For the implementation and development of the CEMP, the following steps on coordination are necessary:

- development of a strategy/working scheme on how an issue should be tackled in practice;
- development of common guidelines, where needed;
- development of common quality assurance tools, where needed;
- development of common assessment tools, where needed;
- planning of activities in space and time;
- submission and management of data in a common database;
- identification of gaps in coverage that need to be filled;
- joint assessment, that is in the appropriate OSPAR working group.

2 Components of the CEMP

4. The criteria for considering whether a substance should be included in the CEMP are set out in the decision tree at Appendix 1 Part B.

5. For the purpose of monitoring components under this Agreement a distinction is made between:

a. Components of the CEMP:

These are those components for which all requirements for realisation of monitoring under the CEMP are in place (i.e. guidelines, quality assurance and assessment tools). Monitoring of the components of the CEMP is mandatory unless a Contracting Party can provide justification for “opting out”. Opting out should always be approved by the OSPAR subsidiary body responsible for assessment and monitoring. Guidance on possible reasons for opting out is at Appendix 1 Part A.

b. Components of the pre-CEMP:

These are components which it has been agreed to be included as components of the CEMP but for which guidelines, quality assurance tools and/or assessment tools are currently lacking. Monitoring of the components of the pre-CEMP is voluntary on a temporary basis, pending the development of those requirements. At the point that a meeting of [HASEC²] recognises that all three of these requirements for coordinated monitoring are in place, the status will become mandatory. Contracting Parties undertake to support the development of the necessary tools as the basis for co-ordinated monitoring. The inclusion of elements in the pre-CEMP with a voluntary status is therefore intended:

- (i) to stimulate the development of the tools needed for co-ordinated monitoring;
- (ii) to provide an early warning to Contracting Parties to prepare for mandatory monitoring;
- (iii) to signal OSPAR's intention to commence co-ordinated monitoring.

6. Monitoring of components of the CEMP or pre-CEMP can be qualified and made subject to clearly defined and agreed conditions. The purpose is to provide the necessary flexibility to answer specific needs and purposes for co-ordinated monitoring of those components under the JAMP. [HASEC]² will review whether the conditions are met for the component concerned and, on this basis, decide whether monitoring of the component should continue under the CEMP.

7. The following components of the CEMP are to be measured on a mandatory basis:

- a. the heavy metals cadmium, mercury and lead in biota and sediment (Appendix 2);
- b. the CB congeners CB 28, CB 52, CB 101, CB 118, CB 138, CB 153, and CB 180 in biota and sediment (Appendix 3);
- c. the PAHs anthracene, benz[a]anthracene, benzo[ghi]perylene, benzo[a]pyrene, chrysene, fluoranthene, ideno[1,2,3-cd]pyrene, pyrene and phenanthrene in biota and sediment (Appendix 4);
- d. TBT-specific biological effects and TBT in sediment or biota (Appendix 5). Monitoring of TBT concentrations in the marine environment in either sediments or biota should be carried out in parallel with monitoring of TBT-specific biological effects;
- e. nutrients in seawater as a requirement of the Eutrophication Monitoring Programme (Appendix 6);
- f. direct and indirect eutrophication effects as a requirement of the Eutrophication Monitoring Programme (Appendix 7).
- g. the brominated flame retardants HBCD and PBDEs 28, 47, 66, 85, 99, 100, 153, 154 and 183 in biota and sediment, and BDE 209 in sediment (Appendix 8);

8. The following components are currently part of the pre-CEMP and are to be measured on a voluntary basis:

- a. the planar CB congeners CB 77, 126 and 169 in biota and sediment (Appendix 9). Monitoring of those congeners in sediment should be undertaken only if levels of marker PCBs as referred to under Appendix 3 are e.g. 100 times higher than the Background Assessment Concentration (Appendix 9);
- b. the alkylated PAHs C1-, C2-, and C3-naphthalenes, C1-, C2- and C3-phenanthrenes, and C1-, C2- and C3-dibenzothiophenes and the parent compound dibenzothiophene in biota and sediment (Appendix 10);

[² Where Ocean Acidification is concerned, CoG will be involved].

- c. PFOS in sediment, biota and water (Appendix 11);
- d. Polychlorinated dibenzodioxins and furans in biota and sediment (Appendix 12). Monitoring of those congeners should be undertaken only if levels of marker CBs as referred to under Appendix 3 are e.g. 100 times higher than the Background Assessment Concentration or, when it is known, as an area with high concentrations of polychlorinated dibenzodioxins and – furans (hot spots);
- e. PAH- and metal-specific biological effects (Appendix 13);
- f. general biological effects (Appendix 14);
- [g. beach litter (Appendix 15) – this appendix is under the control of EIHA and EIHA fulfills the role attributed to HASEC in CEMP as regards management of this appendix;
- h. Ocean Acidification (Appendix 16)].

9. Where the Eutrophication Monitoring Programme is in operation, it forms part of the CEMP.

3. Temporal and Spatial Monitoring

3.1 General

10. The CEMP is intended to generate data for temporal trends and spatial distribution.

11. An assessment may lead to conclusions and recommendations which result in the development of a temporal trend programme from a spatial survey or vice versa. For example:

- a. if an area of concern is identified in a spatial programme, a temporal trend programme may be implemented at a limited number of representative sites;
- b. if a temporal trend changes unexpectedly, a spatial programme may be used to identify contaminant sources or the extent of the problem.

12. Temporal and spatial monitoring are complementary and their relationship is illustrated in Figure 1.

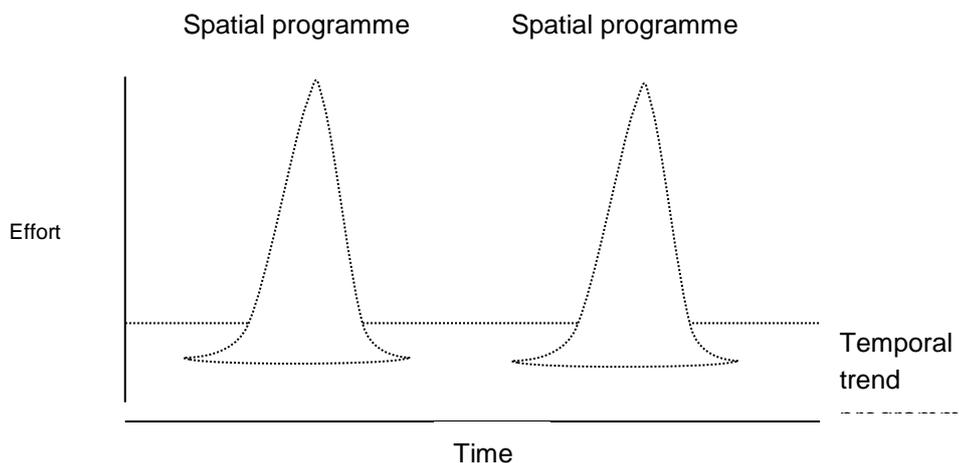


Figure 1: Diagram of the complementary relationship between temporal trend and spatial monitoring programmes.

13. Regional differences in the general level of scientific information on the maritime area, in inputs and in national monitoring programmes require that the temporal and spatial programmes may be region-specific.

3.2 Temporal trend programmes

14. Temporal trend programmes are continuous programmes to detect long-term trends in concentrations or effects of substances in the maritime area. The data should be assessed approximately every 5 years, although the frequency will depend on the contaminant and the matrix. Such programmes are open for revision after every assessment. On the basis of the results of an assessment, the decision can be to continue, to discontinue or to change the programme in terms of the parameters measured, the frequency of measurements or the sampling locations. However, some long-term series may be continued regardless of the results of the assessment if, for example, they have value as a reference time-series. The programmes should consist of both chemical and biological effect measurements selected on the basis of the results of earlier spatial integrated chemical-biological effects programmes. Such programmes should be co-ordinated with input monitoring programmes to enable the link to be made to changes in anthropogenic activity and the assessment of the efficacy of measures taken.

3.3 Spatial programmes

15. Spatial programmes provide information on the concentrations and/or effects of substances in the maritime area. These should be undertaken in accordance with agreements by the Commission and a common schedule of activities - in simple terms, the planning, implementation and reporting.

16. The planning stage should:

- resolve issues such as the availability of guidelines;
- address the need for quality assurance;
- develop the precise objectives (e.g. the statistical) of the programme;
- co-ordinate the sampling requirements in terms of site selection area coverage and frequency, and;
- decide on the allocation of responsibilities and a detailed schedule of activities.

17. Co-ordination could be achieved through a number of mechanisms such as planning workshops, the appointment of a project co-ordinator or lead country.

18. Implementation will be the action required of Contracting Parties and is the data generation phase of the work. It is achieved through national programmes, national programmes co-ordinated on a regional or Convention-wide basis and programmes carried out by a specialist lab on behalf of the Commissions and paid for by Contracting Parties concerned (one-off surveys).

19. At the end of the data-collection stage, there should be an assessment and reporting phase. The achievement of the statistical goals should be evaluated, and the need for further data-collection to fulfil the goals should be determined.

4. Programme coordination and development

4.1 Actions required to update the CEMP

4.1.1 Secretariat

20. For each meeting of the relevant OSPAR working group, the OSPAR Secretariat should update the Appendices to the CEMP. Such a document serves three important purposes:

- a. to identify the extent of the existing coordinated monitoring programme and the gaps in coverage in that programme (that is, the CEMP as implemented);
- b. to identify those issues for which it should be possible to design and initiate monitoring activities (if that was felt to be necessary) (i.e. the parts of the CEMP due for implementation);

- c. to identify those aspects of the CEMP for which development work on monitoring guidelines, quality control procedures or assessment tools is still required (i.e. the parts of the CEMP awaiting implementation pending finalisation of tools).

21. This regularly updated document would provide a clearer agenda for the relevant OSPAR working groups. In addition, the completion of tasks, development of monitoring or assessment tools etc. would provide a clear sense of purpose, progress and achievement.

4.1.2 Subsidiary Bodies

22. The OSPAR subsidiary body responsible for concentrations and effects in the marine environment should periodically consider the implementation of the CEMP, for those aspects of the JAMP where monitoring guidelines, quality control procedures and assessment tools are in place. This consideration should track the progress of these programmes, e.g. collating data, producing assessment reports and initiating new programmes as and when opportunities arise.

23. Contracting Parties should report to the Secretariat, on an annual basis, details of their monitoring activities under JAMP and the data reported to ICES. The information provided by Contracting Parties will be used by the Secretariat to update, prior to each meeting of the relevant OSPAR subsidiary body, an overview of national monitoring programmes. This overview will be used by the relevant working group in its regular examination and update of the CEMP. The agreed arrangements set out, *inter alia*, the timing and format for submission of information to the Secretariat, and the timing of the update of the overview of national monitoring programmes.

[24. Where HSC, in the light of an overall assessment of a monitoring strategy for an OSPAR priority chemical, including costs and effectiveness, concludes that its inclusion in the CEMP should be considered, ASMO should organize a review of the case for inclusion, using the decision tree at Appendix 1 Part B, in order to reach conclusions on the need for coordinated convention-wide monitoring.]

25. Where [HASEC] concludes that the need for coordinated convention-wide monitoring of a component of the CEMP should be reviewed, [HASEC] should ask [appropriate] Working Group to prepare evidence-based advice on the added value of continued monitoring to the interpretation of trends and, as appropriate, to identify options for reducing monitoring efforts where this was not the case. In their decision whether to exclude a component from the CEMP, [HASEC] should be guided by the justification requirements for opting out in Appendix 1 Part A.

4.1.3 Contracting Parties

26. The current content of the National Monitoring Programmes of individual Contracting Parties would be a factor in up-dating the CEMP. However, should the National Monitoring Programme of any individual Contracting Party not provide coverage of the particular aspect of the JAMP for which a monitoring programme under CEMP is proposed, this should not be viewed as an insurmountable barrier to progress for the implementation of that part of the CEMP. Rather, the emphasis should be on that Contracting Party either adopting the tools available or providing good reasons why they should “opt out” of that part of the CEMP. The justification provided by a Contracting Party for opting out of part of the CEMP should always be considered by [HASEC]. Guidance on possible valid reasons for opting out is set out in Appendix 1 Part A.

4.2 Data storage, handling and scientific assessments

27. Assessments based on monitoring data depend critically on practical mechanisms for handling data from different aspects of the JAMP e.g. from integrated biological and chemical programmes and the quality assurance of the data provided. It is therefore important that the number of data storage and handling centres is kept to a minimum. Currently the data centre for handling environmental monitoring data is at ICES, who provide scientific support and processing of data. Independent scientific advice, statistical processing to enable comparisons between data sets, mapping etc. are also provided by ICES. It is important that the role of ICES in this process is developed and strengthened.

28. It is also crucial to link the observed changes in spatial distribution and temporal trends in substances, or their effects, to inputs into the maritime area, and this may require comparison of data in the ICES data bank with data from other data centres.

OSPAR 2015 agreed text for this section: See OSPAR 15/20/1, Annex 12:

ANNEX 1 PART A: Guidance to Contracting Parties wishing to present a case for opting out of elements of the Coordinated Environmental Monitoring (and Assessment) Programme (CEMAP). This text will be added to the Programme when the review procedure has been completed.

Appendix 1 Part A: Guidance to Contracting Parties wishing to present a case for opting out of part(s) of the Coordinated Environmental Monitoring Programme (CEMP)

General

1. In applying this guidance, Contracting Parties should take into account:
 - a. the OSPAR Recommendation [2010/1] on the Strategy for the Joint Assessment and Monitoring Programme, which states that “The Joint Assessment and Monitoring Programme should be implemented. Such implementation implies the commitment by each Contracting Party of an appropriate level of resources in order to achieve the common purposes”;
 - b. the following statements agreed by OSPAR 1998 with regard to the implementation of the CEMP:
 - i. all components of the JAMP matrix should be considered mandatory, with the exception of any components covered specifically by other strategies or programmes adopted at Commission level;
 - ii. in principle, Contracting Parties should only be able to “opt out” of individual components of the JAMP if they are able to justify that these are not of relevance to them.
2. As the first step in formally implementing the CEMP, Contracting Parties reported to SIME 2000 their intentions on implementing all elements of the CEMP. Contracting Parties should subsequently present to [HASEC] the necessary justification for any partial implementation of the CEMP. The case prepared by Contracting Parties should take into account the following guidance:

Justifications

3. Two reasons have been identified for which justification can be considered within OSPAR for opting out of elements of the CEMP:
 1. **The problem in question has not occurred and is unlikely to occur in all, or a specified part, of the maritime area where the Contracting Party has responsibility**
4. Contracting Parties should provide sufficient evidence to justify a conclusion that a problem does not occur.
5. Such evidence should show that:
 - a. no significant anthropogenic inputs³ to the marine environment have occurred or are likely to occur;

or

³ All pathways.

- b. concentrations in the marine environment are near background values for naturally occurring substances and close to zero⁴ for man-made substances.

6. Where Contracting Parties are monitoring biological effects, the effect should be shown either not to occur, or only to occur at a level which is not a cause for concern.

7. In all cases, safeguards should be in place to ensure that the situation will not deteriorate.

II. The problem in question occurred in the past but is now no longer a problem in all, or a specified part, of the maritime area where the Contracting Party has responsibility

8. Contracting Parties should provide sufficient evidence to demonstrate that a problem that did occur in the past has not been a problem for a period of the order of 5 years.

9. Such evidence should show that:

- a. concentrations in the marine environment are below levels that cause concern, i.e. are near background values for naturally occurring substances and close to zero⁴ for manmade substances;
- b. data on inputs³ to the marine environment indicate that the problem will not reoccur in future;
- c. safeguards are in place to ensure that the situation will not deteriorate.

Review

10. For every situation where a Contracting Party has opted out of implementing part of the CEMP, the Contracting Party in question should review the situation:

- a. at least every five years; or
- b. if/when information becomes available to suggest that the Contracting Party should re-enter the CEMP.

11. The outcome of this review should be reported to [HASEC].

⁴ This point has to be defined, but as a starting point the definition in the Water Framework Directive could be applied, i.e. "concentrations close to zero and at least below the limits of detection of the most advanced analytical techniques in general use".

Appendix 1 Part B: Decision tree for considering whether a substance should be included in the CEMP

1. A substance should be included in the CEMP if the following requirements are cumulatively met:
 - a. it is a substance included in the OSPAR List of Chemicals for Priority Action;
 - b. a Background Document for the substance has been developed by OSPAR under the Hazardous Substances Strategy which shows that the substance is used in the Convention area other than as intermediate or in closed systems;
 - c. an OSPAR monitoring strategy has concluded that monitoring in the marine environment is required and has indicated the most appropriate matrix;
 - d. concentrations in the marine environment are considered to be a problem for a significant part of the OSPAR maritime area and/or by a number of Contracting Parties;
 - e. it is found in concentrations in the marine environment which are increasing in the OSPAR maritime area, or which are well above background concentrations;
 - f. proven and widely available analytical techniques exist for the analysis of the substance in various matrices.
2. If one or more requirements are not met, the substances should not be included.
3. Where information is not sufficient to conclude whether or not a substance meets any of the criteria set out in § 1, the question of its inclusion should be revisited in the light of the collation of further information through appropriate action. This could, for example, comprise its inclusion in an annual CEMP assessment, information collection by lead countries or a one-off survey, taking into account the guidance given in §§ 12.1 – 12.3 of the Agreement on Monitoring Strategies for OSPAR Chemicals for Priority Action (Reference number 2004-14). On the basis of a proposal from a lead country, [the responsible HASEC working group] should prepare a detailed proposal for [HASEC] on the appropriate action and its organisation, including a time table.
4. In the light of the conclusions from OSPAR monitoring strategies, [the responsible HASEC working group] should give scientific advice to [HASEC] on the compartment(s) in which the new substance should be monitored under the CEMP.
5. Monitoring of a substance included under the CEMP will be mandatory if the following requirements are cumulatively in place for the agreed monitoring compartments:
 - (i) quality assurance;
 - (ii) assessment tools (BCs, BACs, EACs);
 - (iii) technical guidelines for monitoring.
6. In the absence of any element required under § 5, the new substance will be a component of the pre-CEMP to be measured on a voluntary basis under this Agreement until the outstanding elements have been developed. The commitment to develop these requirements follows automatically from the decision to include the substance under the CEMP.

Components of the CEMP: Appendixes 2 – 8

For the following elements listed in Appendixes 2 – 8, monitoring under the CEMP is mandatory (cf. section 6 of the CEMP Agreement).

Appendix 2 – Mercury, Cadmium, Lead [as updated at ASMO 2007]

Mercury, Cadmium and Lead				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in Biota (Technical Annex 2: Determination of metals)		JAMP Guidelines for Monitoring Contaminants in Sediments (Technical Annex 5: Normalisation of contaminant concentrations. Technical Annex 6: Determination of metals – analytical methods)	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Background Reference Concentrations; Ecotoxicological Assessment Criteria			
Monitoring frequency				
Contracting Parties monitoring	In fish: BE; DE; DK; ES; FR; IE ⁵ ; IS; NL; NO; PT (only Hg); SE; UK (Hg + Pb)	In fish: BE; DE; DK, ES; FR; IE; IS; NL; NO; PT (only Hg); SE; UK	BE; DE; ES; FR; IE; NL; NO; PT, SE; UK	BE; DE; DK; ES; FR; IE; IS; NL; NO; PT, SE; UK
	In mussels: BE; DE; ES; DK; FR ⁶ ; IE; IS; NL; NO; PT; SE; UK	In mussels: BE; DE; DK, FR ⁶ ; IE; IS; NL; NO; PT (only Hg); ES; SE; UK		
Contracting Parties not monitoring				
Contracting Parties with an “opt out”			IS	

⁵ Ireland is currently reviewing temporal trend monitoring in fish

⁶ Monitoring in mussels and/or oysters

Appendix 3 – PCBs [as updated at ASMO 2007]

PCBs				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in Biota (Technical Annex 1: Determination of organic contaminants)		JAMP Guidelines for Monitoring Contaminants in Sediments (Technical Annex 2: Determination of chlorobiphenyls – analytical method)	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Background Reference Concentrations; Ecotoxicological Assessment Criteria.			
Monitoring frequency				
Contracting Parties monitoring	In fish: BE; DE; DK; ES; FR; IE ⁷ ; IS; NL; NO; PT; SE; UK	In fish: BE; DE; DK; ES; FR; IE; IS; NL; NO; PT; SE; UK	BE; DE; ES; FR; IE; NL; NO; PT; SE; UK	BE; DE; DK; ES; FR; IE; IS; NL; NO; PT; SE; UK
	In mussels: BE; DE; DK, ES; FR ⁸ ; IE; IS; NL; NO; PT; SE; UK	In mussels: BE; DE; DK; ES; FR ⁸ ; IE; IS; NL; NO; PT; SE; UK		
Contracting Parties not monitoring				
Contracting Parties with an “opt out”			IS	

Note: For the purposes of OSPAR, PCBs covers: CB 28; CB 52; CB 101; CB 118; CB 138; CB 153; and CB 180.

⁷ Ireland is currently reviewing temporal trend monitoring in fish

⁸ Monitoring in mussels and/or oysters

Appendix 4 – PAHs [as updated at ASMO 2009]

PAHs				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in Biota (Technical Annex 3: Determination of parent and alkylated PAHs in biological materials)		JAMP Guidelines for Monitoring Contaminants in Sediments (Technical Annex 3: Determination of parent and alkylated PAHs in sediments)	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Background Reference Concentrations; Ecotoxicological Assessment Criteria.			
Monitoring frequency				
Contracting Parties monitoring	In mussels: BE; DE; DK; ES; FR ⁹ ; IE; NL; NO; PT; SE; UK	In mussels: BE; DE; DK; ES; FR ⁹ ; IE; NL; NO; PT; SE; UK	BE; DE; FR; ES; IE; NL; NO; PT; SE; UK	BE; DE; DK; FR; ES; IE; NL; NO; PT; SE; UK
Contracting Parties not monitoring	IS	IS	IS	IS
Contracting Parties with an “opt out”				

Note: For the purposes of OSPAR, PAHs covers: anthracene; benz[a]anthracene; benzo[ghi]perylene; benzo[a]pyrene; chrysene; fluoranthene; indeno[1,2,3-cd]pyrene; pyrene; phenanthrene.

⁹ Monitoring in mussels and/or oysters

Appendix 5 - Organotins [as updated by ASMO 2009]

Organotins			
Contributing to JAMP Products:		H1 and H2	
	TBT-specific biological effects	Organotins in sediments	Organotins in Biota
Guidelines in place	JAMP Guidelines for contaminant specific biological effects monitoring	JAMP Guidelines for monitoring contaminants in sediments	JAMP Guidelines for monitoring contaminants in biota
Quality Assurance Procedures in place	QUASIMEME	QUASIMEME	QUASIMEME
Assessment tools available	Provisional JAMP Assessment Criteria for TBT – specific biological effects (<i>OSPAR Agreement 2004-15</i>)	Background Concentrations, Ecotoxicological Assessment Criteria for TBT	Background Concentrations Environmental Assessment Criteria (Reference number 2009-2)
Monitoring Frequency	As recommended in Technical Annex 3 of the JAMP Guidelines for contaminant specific biological effects monitoring		
Contracting Parties Monitoring	DE; DK; ES; FR; IE; IS; NL; NO; PT; SE; UK	BE; DE; ES; FR; IE; NL; NO; PT; SE; UK;	BE, DK; ES, NL; NO; SE, UK
Contracting Parties Not Monitoring			
Contracting Parties with an “opt out”	Not currently applicable for this appendix		

Note: Monitoring of TBT concentrations in the marine environment in either sediments or biota should be carried out in parallel with monitoring of TBT-specific biological effects

Appendix 6 – Nutrients in seawater [as updated at ASMO 2007]

Nutrients in Seawater		
Contributing to JAMP Products E-1 and E-27		
	Non-problem Areas with regard to Eutrophication	Potential Problem Areas with regard to Eutrophication and/or Problem Areas with regard to Eutrophication
Guidelines in place	JAMP eutrophication monitoring guidelines	
Quality Assurance Procedures in place	QUASIMEME	
Assessment tools available	As developed in accordance with the Common Procedure for the identification of the eutrophication status of the Maritime Area	
Contracting Parties monitoring	DE; DK, ES; IE; IS, NO; PT; UK	BE; DE; DK; FR; IE; NL; NO; SE; UK
Monitoring frequency ¹⁰	About every three years during winter ¹¹	Annually during winter and during direct and indirect effects monitoring
Contracting Parties not monitoring		
Contracting Parties with an “opt out”		

Note: For the purposes of OSPAR, nutrients covers: NH₄-N; NO₂-N; NO₃-N; PO₄-P; plus temperature and salinity, and includes SiO₄-Si in potential problem and problem areas with regard to eutrophication (NB. the sum of NO₂-N and NO₃-N can be reported for non-problem areas with regard to eutrophication). Monitoring is a requirement of the Eutrophication Monitoring Programme

¹⁰ Each monitoring event should include sufficient samples to confirm that the maximum winter nutrient concentration has been determined. Winter is defined as the period with lowest algal activity and maximum remineralisation.

¹¹ Reporting should be based on the results of monitoring and/or research programmes and/or current literature.

Appendix 7 – Direct and Indirect Eutrophication Effects [as updated at ASMO 2007]

Direct and Indirect Eutrophication Effects		
Contributing to JAMP Products E1 and E27		
	Non-problem Areas with regard to Eutrophication	Potential Problem Areas with regard to Eutrophication and/or Problem Areas with regard to Eutrophication
Guidelines in place	JAMP eutrophication monitoring guidelines	
Quality Assurance Procedures in place	QUASIMEME; SGQAE; BEQUALM	
Assessment tools available	As developed in accordance with the Common Procedure for the identification of the eutrophication status of the Maritime Area	
Monitoring frequency		Annually at times of maximum growth/activity
Contracting Parties Monitoring	FR; NO	BE; DE; DK; FR; IE; NL; NO; SE, UK
Contracting Parties not monitoring		
Contracting Parties with an “opt out”		

Note: For the purposes of OSPAR, eutrophication effects cover: Phytoplankton chlorophyll; Phytoplankton species composition; Macrophytes; Oxygen; Benthic communities. Monitoring is a requirements of the Eutrophication Monitoring Programme. Monitoring of eutrophication effects in non-problem areas is discretionary.

Appendix 8 - Certain Brominated Flame Retardants (polybrominated diphenyl ethers + hexabromocyclododecane [as updated by ASMO 2008])

Certain Brominated Flame Retardants (polybrominated diphenyl ethers and hexabromocyclododecane)				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for monitoring contaminants in biota		JAMP Guidelines for monitoring contaminants in sediment	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Background Concentrations. BACs, EACs under development			
Monitoring frequency				
Contracting Parties monitoring ¹²	BE; DE; DK ¹³ ; ES; IE; NLNO; SE; UK	BE; DE; DK ¹³ ; ES; IE; NL; NO; SE; UK	BE; ES; IE; NL; NO; SE; UK	BE; DE; ES; IE; NL; NO ; SE; UK
Contracting Parties not monitoring				
Contracting Parties with an “opt out”	Not currently applicable for this appendix			

Note: For the purposes of OSPAR, polybrominated diphenyl ethers covers the congeners PBDEs 28, 47, 66, 85, 99, 100, 153, 154 and 183 for sediment and biota. BDE 209 is covered for sediment but should not be included in any totals but reported separately.

¹² Portugal have reported that they are monitoring brominated flame retardants but need to specify which compartment they are currently monitoring and whether for temporal trend or spatial survey.

¹³ DK monitors in fish only from 2011

Components of the pre-CEMP: Appendixes 9 – 16

The components listed in Appendixes 9 – 16 are awaiting the development of technical guidelines, assessment criteria and/or quality assurance procedures. Pending the completion of this process monitoring of these components is voluntary (cf. section 7 of the CEMP Agreement).

Appendix 9 – Planar PCBs [as updated by ASMO(2) 2010]

Planar PCBs				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in biota		JAMP Guidelines for Monitoring Contaminants in sediments	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Background Concentration. BACs, EACs under development			
Monitoring frequency				
Contracting Parties monitoring	In fish: SE	In fish: SE; DK ¹⁴		DK ¹⁵ , ¹⁴
	In mussels: IE, NO ¹⁶	In mussels: DK ¹⁷		
Contracting Parties not monitoring	BE ¹⁸ ; DE ¹⁹ ; UK	BE ¹⁸ ; DE; UK	BE ¹⁸ ; DE; UK	BE ¹⁸ ; DE; UK
Contracting Parties with an “opt out”	Not currently applicable for this appendix			

Note: Monitoring of planar PCBs in sediments and biota should take place in areas identified as having high CB concentrations (hotspots). Where they are monitored, all 12 CB congeners, both non-*ortho* and mono-*ortho* should be monitored (i.e. CBs 77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169, 189). The relevant ASMO working group has been asked to develop a definition for hotspots..

¹⁴ DK only CB77, 126 and 169 until further notice

¹⁵ Every 6 years

¹⁶ In hotspots

¹⁷ Every 3-6 years

¹⁸ Monitoring in fish is currently under consideration by Belgium

¹⁹ Monitoring is currently under consideration by Germany

Appendix 10 – Alkylated PAHs [as updated by ASMO 2007]

Alkylated PAHs				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for monitoring contaminants in biota		JAMP Guidelines for monitoring contaminants in sediments	
Quality Assurance Procedures in place	QUASIMEME			
Assessment tools available	Under development			
Monitoring frequency				
Contracting Parties monitoring	BE ²⁰ , NO ²¹ ; SE ²² , DK	BE ²⁰ , NO ²¹ , SE ²² , DK	BE ²⁰ , NO	BE ²⁰ , NO, DK
Contracting Parties not monitoring	DE	DE	DE	DE
Contracting Parties with an “opt out”	Not currently applicable for this appendix			

Note: For the purpose of OSPAR, alkylated PAHs cover C1-, C2- and C3-naphthalenes, C1-, C2- and C3-phenanthrenes, and C1-, C2- and C3-dibenzothiophenes and the parent compound dibenzothiophene.

The UK are monitoring C1, C2 and C3 naphthalenes; C1 – phenanthrenes. However as there is no agreed QA, the data are not submitted through to ICES

²⁰ Belgium has been monitoring certain alkylated PAHs and will expand its list to include the recommended alkylated PAHs. Monitoring will take place as soon as definite guidelines are in place

²¹ Norway monitor in hotspots only

²² Sweden monitoring mussels from 2010 onwards

PFOS						
Contributing to JAMP Products H1 and H2						
	Concentrations in sediment		Concentrations in biota		Concentrations in water	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in sediments		JAMP Guidelines for monitoring contaminants in biota		JAMP Guideline for Monitoring PFCs in water	
Quality Assurance Procedures in place			(Pending QUASIMEME programme for 2012)			
Assessment tools available	Background Concentration. BACs, EACs under development					
Monitoring frequency						
Contracting Parties monitoring ²³	NO	NO	NO, SE	NO, SE		
Contracting Parties not monitoring	BE ²⁴ , DE	BE ²⁴ , DE	BE ²⁴ , DE	BE ²⁴ , DE	BE ²⁴ , DE	BE ²⁴ , DE
Contracting Parties with an "opt out"	Not currently applicable for this appendix					

Note: Monitoring for PFOS is included in the CEMP on a temporary basis and subject to ceasing monitoring when there is sufficient evidence to show that concentrations are decreasing and reaching levels which are no longer a cause of concern. Monitoring of PFOS should be reviewed by ASMO 2012. Contracting Parties are encouraged to analyse for other PFOS related substances and to report the results to ICES MCWG

²³ All Contracting Parties are invited to report concentrations in biota, sediment and water to ICES.

²⁴ Monitoring is currently under consideration.

Appendix 12 - Polychlorinated dibenzodioxins and furans [as updated by ASMO(2) 2010]

Polychlorinated dibenzodioxins and furans*				
Contributing to JAMP Products H1 and H2				
	Concentrations in biota		Concentrations in sediments	
	Temporal trends	Spatial surveys	Temporal trends	Spatial surveys
Guidelines in place	JAMP Guidelines for Monitoring Contaminants in biota		Under development	
Quality Assurance Procedures in place	QUASIMEME		<i>Not currently covered by QUASIMEME</i>	
Assessment tools available	Provisional Low Concentrations, BACs, EACs under development			
Monitoring frequency				
Contracting Parties monitoring ²⁵	IE ²⁶ , NO ²⁷ , SE	DK ²⁸ , SE		DK ²⁸
Contracting Parties not monitoring	DE	DE	DE	DE
Contracting Parties with an “opt out”	Not currently applicable for this appendix			

* Monitoring of polychlorinated dibenzodioxins and –furans in sediments and biota should take place in areas identified as having high concentrations of these compounds or marker CBs (hot spots)

²⁵ All Contracting Parties are invited to report concentrations in biota and sediments to ICES in 2008.

²⁶ Ireland monitor in mussels only

²⁷ Norway monitor in hotspots

²⁸ Every 3-6 years for mussels and every 6 years for sediment. From 2011 yearly in fish

Appendix 13 - PAH- and Metal-Specific Biological Effects

PAH- and Metal-Specific Biological Effects		
Contributing to JAMP Products H1 and H2		
	PAH-Specific	Metal-Specific
Guidelines in place	JAMP guidelines for contaminant specific biological effects monitoring	
	(Technical Annex 2: PAH-specific biological effects monitoring) ²⁹	(Technical Annex 1: Metal-specific biological effects monitoring) ^{30,31}
Quality Assurance Procedures in place	Under development by BEQUALM	
Assessment tools available	Under development	
Monitoring frequency		
Contracting Parties monitoring	BE, DE, DK ³² , NL, NO, UK	NO, UK

²⁹ This Technical Annex is temporarily superseded by the relevant information agreed in conjunction with the 3-yr trial adoption and application (March 2012-March 2015) of the JAMP Integrated Guidelines on the Integrated Monitoring and Assessment of contaminants and biological effects, including OSPAR Publication 589 Chapters 3 (Background Document: Cytochrome P4501A activity (EROD)); 4 (Background Document: DNA adducts); 12 (Background Document: PAH metabolites in bile); relevant parts of chapter 5 (Background Document: Externally visible fish diseases, macroscopic liver neoplasms, and liver histopathology).

³⁰ The technique oxidative stress covered by Technical Annex 1 on Metal-specific biological effects is considered to be more appropriate as a research tool.

³¹ This Technical Annex, with the exception on the part related to ALA-D, is temporarily superseded by the relevant information agreed in conjunction with the 3-yr trial adoption and application (March 2012-March 2015) of the JAMP Integrated Guidelines on the Integrated Monitoring and Assessment of contaminants and biological effects, including OSPAR Publication 589 Chapter 10: Background Document: Metallothionein (MT) in blue mussels (*Mytilus edulis*, *Mytilus galloprovincialis*) and the Technical Annex on recommended packages of chemical and biological methods for monitoring on a determinant basis.

³² Denmark monitoring in eelpout since 2010.

Appendix 14 – General Biological Effects

General Biological Effects			
Contributing to JAMP Products:		H1 and H2	
	Whole Sediment Bioassays	Sediment Pore-Water and Elutriate Bioassays	Water Bioassays
Guidelines in place	JAMP Guidelines for General Biological Effects Monitoring ³³		
	Technical Annex 1	Technical Annex 2/3	Technical Annex 4
Quality Assurance Procedures in place	Under development by BEQUALM	Under development of BEQUALM	BEQUALM – [QA available for most bioassays]
Assessment tools available	Under development		
Monitoring Frequency			
Contracting Parties Monitoring	UK		UK

³³ The Technical Annexes 1-4 to these Guidelines are temporarily superseded by the relevant information agreed in conjunction with the 3-yr trial adoption and application (March 2012-March 2015) of the JAMP Integrated Guidelines on the Integrated Monitoring and Assessment of contaminants and biological effects, including OSPAR Publication 589 Chapters on bioassays (chapters 8, 14, 15, 16 and 17)

APPENDIX 14 (cont.)

General Biological Effects					
Contributing to JAMP Products:		H1 and H2			
	CYP1a	Lysosomal Stability	Liver Histopathology/ Macroscopic liver neoplasms	Externally Visible Fish Diseases	Reproductive Success in Fish
Guidelines in place	JAMP Guidelines for General Biological Effects Monitoring ³⁴				
	Technical Annex 5	Technical Annex 6	Technical Annexes 7/8	Technical Annex 9	Technical Annex 10
Quality Assurance Procedures in place	Under development by BEQUALM	Under development by BEQUALM	BEQUALM	BEQUALM	Under development by BEQUALM
Assessment tools available	Under development				
Monitoring Frequency					
Contracting Parties Monitoring	DK ³⁵ , NO, SE, UK	DK, UK ³⁶	DE, NL, SE, UK	DE, NL, SE, UK	DK, SE

³⁴ The Technical Annexes 5 and 7-10 to these Guidelines are temporarily superseded by the relevant information agreed in conjunction with the 3-yr trial adoption and application (March 2012-March 2015) of the JAMP Integrated Guidelines on the Integrated Monitoring and Assessment of contaminants and biological effects, including OSPAR Publication 589 Chapters 3 (Background Document: Cytochrome P4501A activity (EROD)); Chapter 9: (Background Document: Lysosomal stability as a global health status indicator in biomonitoring, relevant parts of chapter 5 (Background Document: Externally visible fish diseases, macroscopic liver neoplasms, and liver histopathology); Chapter 6:(Background Document: Histopathology of mussels (*Mytilus* spp.) for health assessment in biological effects monitoring); 13 (Background Document: Reproductive success in eelpout (*Zoarces viviparus*)).

Technical Annex 6 is being replaced by the new Technical Annex on Lysosomal stability to be adopted by HASEC 2013.

³⁵ Denmark monitoring in eelpout since 2010.

³⁶ UK started monitoring biological effects as of 2010.

Appendix 15 – beach litter

[as adopted at ASMO(2) 2010]

Beach litter			
Contributing to JAMP Product BA-5, BA-6			
	Number of items per unit length of beach (100; 1 km)		
	Temporal trends	Spatial surveys	
Guidelines in place	Approved by BDC 2009; to be published in 2010		
Quality Assurance Procedures in place	a) Guidelines in place; b) beach litter data are entered/checked in regional DBase by national coordinators, to be further developed		
Assessment tools available	Existing assessments: “OSPAR Pilot project on monitoring beach litter” (2007); “Marine litter in the NE Atlantic Region” (2009; OSPAR/KIMO; JAMP Assessment for QSR 2010); Synthesis report 2001- 2009 to be submitted to BDC 2010; advanced statistical analysis technique under development;		
Monitoring frequency	4 x per year on reference beaches		
Contracting Parties ³⁷ monitoring	NL, BE, FR, GER, IRE, SP, UK, SW		
Contracting Parties not monitoring	DK, POR ³⁸ , NO/ICE ³⁹ ,		
Contracting Parties with an “opt out”	Not currently applicable for this appendix		

³⁷ Switzerland, Luxemburg, Finland not taken into account

³⁸ Portugal monitored since 2002; no monitoring since 2007

³⁹ Norway and Iceland expressed interest to start monitoring

[as agreed by HASEC 2014]

Ocean acidification⁴⁰				
Contributing to JAMP Product A-1 and A-7				
	pH	Total alkalinity	Dissolved inorganic carbon	pCO₂
Guidelines in place	JAMP guidelines for monitoring chemical aspects of ocean acidification adopted by HASEC 2014 (based on work finalised by ICES MCWG in 2012 ⁴¹ and the SGOA]			
Quality Assurance Procedures in place	Not currently developed. CRMs are available for TA, DIC. CRMs exist for pH but it is not currently clear if sufficient to support routine monitoring. No CRMs exist for pCO ₂ but calibration gas mixtures are available. Not clear how well CRMs from Scripps Institute would be able to support a full monitoring programme ⁴² .			
Assessment tools available	The role/purpose of assessment criteria for ocean acidification is currently being considered.			

⁴⁰ ICELAND Under the heading: Dissolved inorganic carbon: Iceland quarterly (deep water). pCO₂: Iceland quarterly (deep water); continuously during RV cruises. Iceland mentions that those measurements have been on-going for quite many years.

⁴¹ SGOA is further working to produce a broader framework for OA monitoring but it is a different more conceptual approach. The guidelines are the manual for chemistry monitoring.

⁴² A workshop has been proposed by MCWG and SGOA to address quality assurance and methodological issues for OA measurements. This includes use of reference materials.

Contracting Parties monitoring (and their monitoring frequency)*	BE (continuous, ship-based and discrete samples); DE NL (monthly/fortnightly); NO ⁴³ (annually (deep water), quarterly (surface water); SE (annually-monthly) + underway observations (ferrybox continued until end 2014) ⁴⁴ ; UK ⁴⁵	NO (annually (deep water), quarterly (surface water); SE (annually-monthly) UK (weekly); IE (annual ship based)	BE (monthly) IC: quarterly (deep water) NO (annually (deep water), quarterly (surface water)); UK (weekly); IE (annual ship based)	BE (continuously during RV cruises) IC: quarterly (deep water), continuously during RV cruises NO ⁴³ (continuous during RV cruises and on fixed station) UK (continuously during RV cruises (E&W now, Sc by May 2012); SE: underway observations (ferrybox continued until end 2014) ⁴⁴
Contracting Parties not monitoring routinely	DK; IE; ES; FR ⁴⁶	DK; ES; NL; DE; BE; FR ⁴⁶	DK; ES; NL; DE; FR ⁴⁶ ; SE ⁴⁶	DK; IE; NO; ES; NL; DE; FR ⁴⁶ ;
Contracting Parties with an “opt out”	Not currently applicable for this appendix			

*: In the mature phase, monitoring for assessment of ocean acidification (not associated effects) should take place in late Winter prior to the Spring bloom (source – draft monitoring guidelines in MIME 11/03/03-E(L): section 4.1). This is because it is the period of least change resulting from biological activity.

⁴³ Norway noted that for continuous ship-based monitoring for these parameters, testing is ongoing and should be operational with some modifications, by early 2014

⁴⁴ Sweden is making OA measurements (total alkalinity, pH, pCO₂ and CO₂ in air) via a ferry box system. This work is funded to the end of 2014, and covers the Kattegat area of the Greater North Sea as well as the entire Baltic. The project intends to report data to the IOCCP process, although a national application to report to ICOS was not supported

⁴⁵ UK is now monitoring pH in surface and bottom water, and has implemented a ferrybox system for continuous monitoring aboard CEFAS Endeavour.

⁴⁶ Subject to confirmation whether ultimately included in MSFD monitoring programme.