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COMMENTS BY GREENPEACE ON THE OSPAR DRAFT STRATEGY TO IMPLEMENT OSPAR'S OBJECTIVE WITH REGARD TO HAZARDOUS SUBSTANCES

1. INTRODUCTION

1.1 Greenpeace has closely followed the development of the OSPAR strategy concerning the Implementation of OSPAR's Objective with Regard to Hazardous Substances. This is being considered by The OSPAR Working Group on Diffuse Sources (DIFF) in Oslo 20-24th October 1997 in its latest form as submitted to the Joint Meeting of the Oslo and Paris Commissions in Brussels 2-5th September 1997

1.2 Greenpeace notes the considerable progress that has been made in defining this strategy but, nonetheless, continues to be concerned by several aspects of the strategy in its latest form. These concerns relate to the proposed mechanisms for the selection and prioritisation of hazardous substances and the evaluation of certain categories of hazard.

1.3 Greenpeace notes that DIFF has been invited to examine various proposals in relation to the continuing development of the OSPAR strategy as part of its work programme. These comments are made in relation to this proposed work programme and to the relevant elements of the Draft Strategy about which Greenpeace has concerns.

2. DEFINITIONS

2.1 Greenpeace is concerned that the Commission proposes to rely upon internationally accepted methods and criteria in assessing the hazard posed by chemicals or groups of chemicals.

2.2 While it is recognised that hazard is an intrinsic property of a chemical, it remains true that there may be no internationally accepted criteria for defining hazard other than in terms of the surrogate parameters used to quantify toxicity, persistence and potential for bioaccumulation. This is particularly true of substances which can act upon the endocrine system and for which no surrogate predictive parameters exist. For such substances, classical dose/ response assumptions may not hold true. Although endocrine disrupting chemicals are dealt with elsewhere in the document, there is a need to define

specifically an inclusive category under Section 1. In addition it is unlikely to be possible specifically to assign hazard designations to chemicals which are discharged routinely but for which no identification may be possible, or for which no information exists.

2.3 Under the definitions, there is no provision for the evaluation of mixtures beyond synergistically acting substances. It remains true that complex mixtures of chemicals discharged to the marine environment may have hazardous properties but the components of the mixtures responsible cannot be readily isolated and characterised. Impacts may be due to additive effects rather than synergistic interactions. There is a need within the strategy to consider development of a means to regulate mixtures when the toxic components cannot be readily identified. This could be incorporated as an additionally defined group under 1.1 (c).

2.4 This could be simply achieved by defining a category for hazardous discharges where unidentified components / uncharacterised mixtures have demonstrable hazardous properties, or where their characterised components either singly or in combination give rise to a reasonable expectation of the same. This would be in accord with the provisions of Para 17 of the Esbjerg declaration and would facilitate the regulation of both point source discharges and diffuse inputs of complex mixtures, although it is recognised that the characterisation of chemical mixtures from diffuse sources may be subject to considerable analytical limitations.

2.5 Under Section 1.1 b the exclusion of removable solvents which may be separated does not appear logical. Under most practical circumstances complete solvent removal is impracticable and residues will be present in the final material, perhaps as a component of a complex chemical mixture. Since solvents can modify the toxicological properties of substances, or be hazardous in their own right, this exclusion could undermine the effective control of substances deserving of prioritisation. For example, solvents such as benzene or perchloroethylene could fall into this category.

2.6. Under 1.1 c 1. reference is made to substances which require preventive action on account of the risk posed to "man and the environment". This should be changed to read "man or the environment" to make clear that both factors can individually justify taking action.

3. STRATEGY of OSPAR

3.1 Overall the strategy proposed appears to improve little on the "substance by substance" approach previously used in OSPAR and within the European Union. Such an approach has the major disadvantage that it will inevitably be slow and cumbersome and lead to delays in taking effective action.

3.2 As a means of speeding up the prioritisation process, it should be noted that many of the substances listed are already grouped according to their chemical properties in the list contained in the Appendix. Elements of these groups might be expected to share similar hazard profiles. Further sub-grouping within these broad groups, for example, of the

halogenated alkanes and alkenes could usefully focus the prioritisation procedure. These and other sub-groupings could be justified under 1.1 c, either as it stands or, preferably, by defining groups of substances on the basis that their chemical structure and /or properties might lead to the reasonable expectation of common hazards.

3.3 In this regard a useful accessory to the selection and prioritisation process could be a mechanism whereby all substances contained within a group and for which there is insufficient information to make a decision should be assigned the properties of the most hazardous chemical identified in the group until data are forthcoming to change this designation. This would be entirely in accordance with the precautionary principle as a guiding principle of the strategy (Section 2.1)

3.4 For chemicals which could be classified in two or more groups on the basis of their chemical structure or hazardous properties, the same principle should apply.

3.5 Greenpeace notes the opinion of Norway concerning Para 2.1 c and considers its concerns entirely justified. Accordingly, Greenpeace considers that the whole list contained in the Appendix to the strategy should be reworked into appropriate groups and a reverse listing approach adopted to address the members of these groups.

3.6 On the basis of the provisions of Para 2.1, 2.2 and 2.3, Greenpeace is concerned that selection and prioritisation of substances may take place on the basis of simplified generic risk assessment procedures, involving consideration of the PEC/PNEC ratio. In particular, Greenpeace believes that those chemicals exhibiting persistent or bioaccumulative properties, whether or not a toxic property has been detected, should be targeted for zero-emissions in accordance with Para. 17 of the Esbjerg Declaration. This should also apply to other substances with other combinations of the index properties. A strong case can be made for the elimination of toxic and bioaccumulative chemicals which are not persistent and of toxic and persistent chemicals which do not appear to bioaccumulate.

3.7 The justification for this suggestion is that, under some circumstances, a persistent and toxic chemical may exist in an equilibrium state with other environmental compartments allowing biological impacts to be exerted. Toxic and bioaccumulative chemicals may give rise to impacts at levels in the food chain other than those in which they are tested. Persistent and bioaccumulative chemicals have the potential to interefere with organismal processes in a manner which is not easily detected at the organismal level but which may have community level significance.

3.8 It must be recognised also that the toxicity tests currently in place for chemical assessments in the EU and elsewhere cannot be used in the prediction of ecosystem disturbance. The inapplicability of toxicity tests in this regard is acknowledged widely in the scientific literature.

3.9 Provision also needs to be made for the reliable identification of chemicals for which dose/response relationships violate classical assumptions. This is best known for

endocrine disrupting chemicals, but may also hold true for chemical mixtures interacting with sediments under certain circumstances. For example, when contaminated sediments are diluted with uncontaminated materials, departures from monotonic dose/response relationships have been observed and reported in the scientific literature.

4. USE OF FRESHWATER RISK ASSESSMENT PROCEDURES

4.1 Section 2.2 b suggests that freshwater risk assessments be investigated for potential application to marine systems. Since most of these assessments have been based on generic risk assessments rather than being holistic ecological risk assessments, Greenpeace has the same concerns as outlined in Para 3 above. It should also be recognised that hazard assessments using single species toxicity tests and subsequent risk assessments based upon the results have, in some important cases, failed to resolve the true extent of the potential impact in marine systems. In the case of offshore installations this has led to the underestimation of impact areas as later established and characterised by sensitive, community based, monitoring techniques.

4.2 Freshwater assessment techniques have developed around the demonstrably fallacious "most sensitive species" concept. Freshwater ecosystems, however, have proven more amenable to study than marine ecosystems and are relatively better understood.

4.3 Greenpeace therefore believes that, given the markedly different properties of marine systems, few of the freshwater risk assessment techniques currently available can be easily translated to marine systems. In particular, the common form of risk assessments which depends upon hazard being assessed on the basis of responses of a notional most sensitive component of the ecosystem are particularly inapplicable. Hence, Greenpeace recognises the relevance of hazard assessment procedures in defining hazardous properties but does not accept that these can be reliably extended to predict impact in whole ecosystems *cf* Para 3.8 above.

5. ENDOCRINE DISRUPTING CHEMICALS

5.1 Greenpeace notes under Section 4.5 of the Annex to the Draft Strategy the proposal to develop evaluation techniques for endocrine disrupting chemicals in the marine environment. It appears that the focus of this effort is in the identification of oestrogenic chemicals. Other endocrine functions could also be impacted and consideration should be given to the development of a broader screen of *in vitro* assays for chemical screening. These can currently be used to detect androgenic as well as oestrogenic effects and priority should be given to extending the range of functions which they can address.

5.2 It must be recognised that endocrine systems of invertebrates differ markedly from those of vertebrates. Accordingly, there is still the need to understand more fully basic invertebrate endocrine function as well as any mechanisms of potential disruption. This aspect should not be ignored as part of the emerging work programme. .

5.3 Greenpeace notes that many pesticide formulations contain chemicals which are specifically designed to inhibit or exaggerate hormonally controlled processes in invertebrates. Chemicals based upon such mechanisms of action should be prioritised for evaluation and control.

5.4 Similarly, some chemicals have already been confirmed as disrupting the endocrine system in various species. These chemicals should be regarded, therefore, as highly suspect and prioritised for action in the marine environment. This suspicion should extend to chemicals with similar molecular structures until evidence emerges to confirm that they do not exhibit such hazardous properties. For example, several phthalate plasticisers have shown endocrine disrupting activity in screening tests. Accordingly, it would be both prudent and effective to target the whole group of phthalates for prioritisation and control.

5.5 The reproductive behaviour and potential of some marine species are known to be mediated by chemical messenger compounds which are not strictly hormones in the accepted sense. In addition, chemical defence compounds are also used by marine species to a considerable extent. Since interference with these chemical pathways could potentially cause extreme dysfunction at the population level and above, such chemical mediation pathways should be treated in the same way as endocrine functions. Such dysfunction might not be detectable in single organisms. (See also Para 5.8 below) It follows that hazardous substances which interfere with or impair these chemical messenger/defence functions should be treated as priority endocrine disrupting chemicals.

5.6 Greenpeace notes also that preliminary studies have shown a wide spectrum of response by marine fish to oestrogenic chemicals. This should be borne in mind when selecting a target species. The need to consider more than one fish species should be evaluated.

5.7 While Greenpeace acknowledges the long term need to evaluate endocrine disruptive chemicals on a quality controlled basis, this should not interefere with obvious short-term priorities. These should centre around the simple identification of potential endocrine disrupting properties in the short-to-medium term. Certainly, the control and regulation of these chemicals should not be predicated upon the ability to detect effects in the wider environment since the development of suitably sensitive biomarkers and focussed survey techniques is likely to take a considerable time.

5.8 On the basis of the observations above Greenpeace notes with great concern the use, in the OSPAR draft strategy of the Weybridge Workshop definition of a potential endocrine disruptor. By potentially taking into account only impacts detectable in whole organisms it is likely to lead to considerable delays in prioritising these chemicals. The problem stems from the fact that most of developed tests and those under development use screening assays based on engineered yeasts or cultured cell lines. Relatively few validated whole organism tests exist. In Greenpeace's view any chemical identified as a potential endocrine disruptor in screening tests should be marked for prioritisation and control as consistent with the precautionary principle.

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Date sent:	**Mon, 29 Sep 1997 17:50:40 +0000**
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Send reply to:	**Remi.Parmentier@diala.greenpeace.org**
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Enclosed the Diff submission.

COMMENTS ON THE *OSPAR DRAFT STRATEGY TO IMPLEMENT OSPAR'S OBJECTIVE WITH REGARD TO HAZARDOUS SUBSTANCES*

Submitted by *Greenpeace International*

to the Meeting of the of the *Working Group on Diffuse Sources (DIFF)*

of the *OSPAR Commission*

Oslo, 20-24 October, 1997

1. INTRODUCTION

1.1 Greenpeace has closely followed the development of the OSPAR strategy concerning the *Implementation of OSPAR Objective with Regard to Hazardous Substances.* We would like to make a number of proposals to improve the draft that was circulated at *OSPAR 97* (2-5 September, 1997) as *Working Document No 10.*

1.2 We note the notable progress that has been made in defining this strategy but, nonetheless, we continue to be concerned by several aspects of the draft in its latest form. These concern the mechanisms for the selection and prioritisation of hazardous substances, and the evaluation of certain categories of hazard.

1.3 Greenpeace notes that *DIFF* has been invited to examine various proposals in relation to the continuing development of the *OSPAR strategy* as part of its work programme. These comments are made in relation to this proposed work programme and to the relevant elements of the *Draft Strategy* about which Greenpeace has concerns.

2. DEFINITIONS

2.1 We are concerned with the possible consequences of the reference to *reliance upon internationally accepted methods and criteria in assessing the hazard posed by chemicals or groups of chemicals.*

2.2 While it is recognised that hazard is an intrinsic property of a chemical, it remains true that there may be no internationally accepted criteria for defining hazard other than in terms of the surrogate parameters used to quantify toxicity, persistence and potential for bioaccumulation. This is particularly true of substances which can act on the endocrine system and for which no surrogate predictive parameters exist. For such substances, classical dose/response assumptions may not hold true. Although endocrine disrupting chemicals are dealt with elsewhere in the document, there is a need to define specifically an inclusive category under *Section 1.* In addition it is unlikely to be possible specifically to assign hazard designations to chemicals which are discharged routinely, but for which no identification may be possible, or for which no information exists.

2.3 Under the definitions, there is no provision for the evaluation of mixtures beyond synergistically acting substances. It remains true that complex mixtures of chemicals discharged to the marine environment may have hazardous properties but the components of the mixtures responsible cannot be readily isolated and characterised. Impacts may be due to additive effects rather than synergistic interactions. There is a need within the strategy to

consider development of a means to regulate mixtures when the toxic components cannot be readily identified. This could be incorporated as an additionally defined group under 1.1 (c).

2.4 It could be simply achieved by defining a category for hazardous discharges where unidentified components/uncharacterised mixtures have hazardous properties, or where their characterised components either singly or in combination give rise to a reasonable expectation of the same. This would be in accord with the *1992 OSPAR Ministerial Declaration,* Para 17 of the *Esbjerg Declaration*, and the current draft *OSPAR Objective*, and it would facilitate the regulation of both *point* source discharges and *diffuse* inputs of complex mixtures, although it is recognised that the characterisation of chemical mixtures from *diffuse* sources may be subject to considerable analytical limitations.

2.5 Under Section 1.1 b the exclusion of removable solvents which may be separated does not appear logical. Under most practical circumstances, complete solvent removal is impracticable, and residues will be present in the final material, perhaps as a component of a complex chemical mixture. Since solvents can modify the toxicological properties of substances, or be hazardous in their own right, this exclusion could undermine the effective control of substances deserving prioritisation. For example, solvents such as *benzene* or *perchloroethylene* could fall into this category.

2.6. Under Para 1.1 c(ii)1., reference is made to substances which require preventive action on account of the risk posed to *"man and the environment"*. This should be changed to read *"man or the environment"* to make clear that both factors can individually justify taking action.

3. STRATEGY of OSPAR:

3.1 Overall the strategy proposed appears to improve little on the *"substance by substance"* approach previously used in OSPAR and within the European Union. Such an approach has the major disadvantage that it will inevitably be slow and cumbersome and lead to delays in taking effective action.

3.2 As a means of speeding up the prioritisation process, it should be noted that many of the substances listed are already grouped according to their chemical properties in the list contained in the Appendix. Elements of these groups might be expected to share similar hazard profiles. Further sub-grouping within these broad groups, for example, of the *halogenated alkanes* and *alkenes* could usefully focus the prioritisation procedure. These and other sub-groupings could be justified under 1.1 c, either as it stands or, preferably, by defining groups of substances on the basis that their chemical structure and/or properties might lead to the reasonable expectation of common hazards.

3.3 In this regard a useful accessory to the selection and prioritisation process could mechanism whereby all substances contained within a group and for which there is insufficient information to make a decision should be assigned the properties of the most hazardous chemical identified in the group until data are forthcoming to change this designation. This would be entirely in accordance with the *precautionary principle.*

3.4 For chemicals which could be classified in two or more groups on the basis of their chemical structure or hazardous properties, the same should apply.

3.5 In connection with the views of Norway concerning Para 2.1 c (Footnote 4), we find Norway´s concerns entirely justified. Accordingly, the whole list contained in the Appendix to the strategy should be reworked into appropriate groups, and a reverse listing approach adopted to address the members of these groups.

3.6 On the basis of the provisions of Para 2.1, 2.2 and 2.3, we are concerned that selection and prioritisation of substances may take place on the basis of simplified generic risk assessment procedures, involving consideration of the PEC/PNEC ratio. In particular, those

chemicals exhibiting persistent or bioaccumulative properties, whether or not an immediate toxic property has been detected, should be targeted for zero-emission in accordance with the *1992 OSPAR Ministerial Declaration,* Para 17 of the *Esbjerg Declaration* and the draft *OSPAR Objective.* This should also apply to other substances with other combinations of the index properties. A strong case can be made for the elimination of toxic and bioaccumulative chemicals which are not persistent, and of toxic and persistent chemicals which do not appear to bioaccumulate.

3.7 The justification for this suggestion is that, under some circumstances, a persistent and toxic chemical may exist in an equilibrium state with other environmental compartments allowing biological impacts to be exerted. Toxic and bioaccumulative chemicals may give rise to impacts at levels in the food chain other than those in which they are tested. Persistent and bioaccumulative chemicals have the potential to interfere with organismal processes in a manner which is not easily detected at the organismal level, but which may have community-level significance.

3.8 It must be recognised also that the toxicity tests currently in place for chemical assessments in the EU and elsewhere cannot be used in the prediction of ecosystem disturbance. The inapplicability of toxicity tests in this regard is acknowledged widely in the scientific literature.

3.9 Provision also needs to be made for the reliable identification of chemicals for which dose/response relationships violate classical assumptions. This is best known for endocrine disrupting chemicals, but may also hold true for chemical mixtures interacting with sediments under certain circumstances. For example, when contaminated sediments are diluted with uncontaminated materials, departures from monotonic dose/response relationships have been observed and reported in the scientific literature.

4. USE OF FRESHWATER RISK ASSESSMENT PROCEDURES

4.1 Section 2.2 b suggests that freshwater risk assessments be investigated for potential application to marine systems. Since most of these assessments have been based on *generic risk assessments* rather than being *holistic ecological risk assessments*, we have the same concerns as outlined in Section 3, above. It should also be recognised that hazard assessments using single species toxicity tests and subsequent risk assessments based upon the results have, in some important cases, failed to resolve the true extent of the potential impact in marine systems. In the case of offshore installations, this has led to the underestimation of impact areas as later established and characterised by sensitive, community-based, monitoring techniques.

4.2 Freshwater assessment techniques have developed around the demonstrably fallacious *"most sensitive species"* concept. Freshwater ecosystems, however, have proven more amenable to study than marine ecosystems and are relatively better understood.

4.3 As a result, given the markedly different properties of marine systems, few of the freshwater risk assessment techniques currently available can be easily translated to marine systems. In particular, the common form of risk assessments which depends upon hazard being assessed on the basis of responses of a notional most sensitive component of the ecosystem are particularly inapplicable. Hence, we recognise the relevance of hazards assessment procedures in defining hazardous properties, but we do not accept that these can be reliably extended to predict impact in whole ecosystems (cf. Para 3.8, above).

5. ENDOCRINE DISRUPTING CHEMICALS

5.1 We note under Section 4.5 of the Annex to the Draft Strategy the proposal to develop evaluation techniques for endocrine disrupting chemicals in the marine environment. It appears that the focus of this effort is in the identification of oestrogenic chemicals. Other endocrine functions could also be impacted and consideration should be given to the development of a broader screen of *in vitro* assays for chemical screening. These can

currently be used to detect androgenic as well as oestrogenic effects, and priority should be given to extending the range of functions which they can address.

5.2 It must be recognised that endocrine systems of invertebrates differ markedly from those of vertebrates. Accordingly, there is still the need to understand more fully basic invertebrate endocrine function, as well as any mechanisms of potential disruption. This aspect should not be ignored as part of the emerging work programme.

5.3 Many pesticide formulations contain chemicals which are specifically designed to inhibit or exaggerate hormonally controlled processes in invertebrates. Chemicals based upon such mechanisms of action should be prioritised for evaluation and control.

5.4 Similarly, some chemicals have already been confirmed as disrupting the endocrine system in various species. These chemicals should be regarded, therefore, as highly suspect and prioritised for action in the marine environment. This suspicion should extend to chemicals with similar molecular structures until evidence emerges to conform that they do not exhibit such hazardous properties. For example, several *phtalates plasticisers* have shown endocrine disrupting activity in screening tests. Accordingly, it would be both prudent and effective to target the whole group of *phtalates* for prioritisation and control.

5.5 The reproductive behaviour and potential of some marine species are known to be mediated by chemical messenger compounds which are not strictly hormones in the accepted sense. In addition, chemical defence compounds are also used by marine species to a considerable extent. Since interference with these chemical pathways could potentially cause extreme dysfunction at the population level and above, such chemical mediation pathways should be treated in the same way as endocrine functions. Such dysfunction might not be detectable in single organisms. (See also Para 5.8, below). It follows that hazardous substances which interfere with or impair these chemical messenger/defence functions should be treated as priority endocrine disrupting chemicals.

5.6 We note also that preliminary studies have shown a wide spectrum of response by marine fish to oestrogenic chemicals. This should be borne in mind when selecting a target species. The need to consider more than one fish species should be evaluated.

5.7 While we acknowledge the long term need to evaluate endocrine disruptive chemicals on a quality controlled basis, this should not interfere with obvious short-term priorities. These should centre around the simple identification of potential endocrine disrupting properties in the short-to-medium term. Certainly, the control and regulation of these chemicals should not be predicated upon the ability to detect effects in the wider environment since the development of suitably sensitive biomarkers and focused survey techniques is likely to take a considerable time.

5.8 On the basis of the observations above Greenpeace notes with great concern the use, in the *OSPAR draft strategy* of the *Weybridge Workshop definition* of a potential endocrine disruptor. By potentially taking into account only impacts detectable in whole organisms, it is likely to lead to considerable delays in prioritising these chemicals. The problem stems from the fact that most of developed tests and those under development use screening assays based on engineered yeasts or cultured cell lines. Relatively few validated whole organism tests exist. In Greenpeace´s view, any chemical identified as a potential endocrine disruptor in screening tests should be marked for prioritisation and control as consistent with the precautionary principle.

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