

**AN EC LAW ASSESSMENT - BLUE MUSSEL PLANTS - QUOTA
SYSTEMS --- RECOVERING NITROGEN FROM THE SEA**

**An EC law assessment of blue mussel plants
and quota systems as a tool for recovering
nitrogen from the sea.**

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This (draft) report contains 4 chapters. The first chapter constitutes the core of the report. The second chapter summarizes some elementary environmental aspects. The third chapter briefly summarizes the urban waste water directive. The fourth and last chapter is as important as the first chapter, since it contains the analysis of full analogous compatibility and how such compatibility can be tested for.

Some of the main findings are as follows:

1. The objective of the directive can be fully achieved even with a blue mussel alternative if, but only if, the alternative in the individual case passes an FAC test as described in chapter 4.
2. This typically excludes urban waste water discharges in fresh water recipients from participating in a quota system but makes the systems open for the participation from plants with coastal discharges.
3. It follows from the criteria examined in the test that the national legal framework must be sufficient for legal certainty around the alternative, which includes i.a. re-licensing (or something to the same legal effect) of the waste water treatment plants which take part in the quota system, and not only the licensing of mussel plants.
4. Carefully elaborated EIA documents are necessary in order for the test to be carried out successfully.

1. Methodology and conclusions

This chapter can be read as the core part, although its full implications will not stand out perfectly without also reading the fourth chapter, which lays down the essentials of full analogous compliance.

101. The problem posed to me for legal assessment has been understood as being the following.

The urban waste water treatment directive of 1991 (91/271/EEC) as amended by directive 98/15/EC requires under certain conditions collecting urban waste water systems and, for discharges in sensitive areas from agglomerations of more than 10.000 p.e – tertiary treatment¹ of such water. This additional requirement aims in particular at substantially reducing the introduction of nitrogen into the receiving water.

102. Such treatment, as defined in the directive, is not only characterized from a result perspective, but the directive also lays down how it shall be carried out, namely by means of treatment at the waste water treatment plant, from which the treated waste water is discharged into the recipient. In other words: The directive mainly presumes, and regulates, *end-of-pipe* solutions.

103. However, since scientists and others now have designed an alternative technique for achieving the same result as regards reduction of nitrogen substances *in* the receiving waters (corresponding to the objective behind the directive), based on blue mussel farming, and by harvesting the mussels, thereby taking back from the recipient at least as much nutrients as would have been reduced with an end-of-pipe solution, the question has been put to me whether this alternative, the blue mussel alternative, to an end-of-pipe solution is in conflict with EC law including the urban waste water treatment directive.

¹ In the terminology of the directive: more stringent treatment.

104. Answering such a question calls for an environmental legal analysis and an EC law analysis in interaction, without compromising any theory or doctrine of environmental and/or EC law.

105. First of all, the natural scientific basis must be sufficient for assessing whether, and how, the blue mussel alternative and the end-of-pipe solution affect the marine environment, especially with respect to eutrophication. To this end, some material supplied by Nordic Shell Production AB plus general environmental knowledge, informal consultations, other types of information and previous experience were used for an introductory assessment. Later, EIA-documents prepared by Nordic Shell were included, at first drafts and later more elaborated documents.

I then came to the conclusion that, provided certain criteria are met as regards the location of mussel farms in relation to the location of ends of pipe, and provided that the mussel farms are managed properly, the blue mussel alternative will be compatible with the end-of-pipe solution *as regards the protection of marine environment against eutrophication (the environmental result)*. The material and other information available fully supports this conclusion. The responsibility *for the natural scientific basis* of the conclusion rests with those experts, who have compiled the EIA documents, while I take the responsibility for the conclusions.

106. Secondly, an analysis of the urban waste water treatment directive was made focussing on (a) its environmental objective and (b) its rules on *how* this objective is to be achieved. These last rules (b) are in my analysis considered as *instrumental* rules, meaning that they are prescribed as instruments (or tools) for achieving the objective.

I have come to the conclusion that the blue mussel alternative fully complies *with the objective* of the directive, provided that the criteria mentioned in 105 are met. I have then concluded that a critical, consequential issue is whether it is legally possible to choose *another instrument* than that prescribed by the directive, provided that full compliance is achieved as regards the achievement of the objective of the directive.

107. Normally, the (legal) function of a directive is to direct the member states as regards *result*, leaving to the states to decide on *how* to achieve this result. On the other hand, many directives are so detailed, so that this basic

function – although still legally valid – in reality becomes more or less overridden by *how* directives define what is to be achieved. The urban waste water treatment directive is a clear example of this. It can be read as being rather specific also on the instruments to be applied (tertiary end-of-pipe solutions) and it specifies only a few exceptions and alternatives. The mere existence of alternatives, which are much more cost-effective although giving the same result *as regards phosphorus and nitrogen reduction in the marine environment*, are not directly found in the text of the directive.

108. This brought my analysis to the question whether the instrumental part of the directive was an objective in itself, or whether there were other reasons for the directive including not only the environmental result but also the technical means for achieving it. I have concluded that at the time of the directive being adopted, end-of-pipe solutions were the only ones practically known and generally available, but there is no indication what so ever in the preamble, or the directive as such that end-of-pipe solutions were an objective of its own.

109. This conclusion, on the other hand, must be dealt with cautiously, since it is quite clear from the directive that in sensitive water nutrients *shall* be reduced for the sake of eutrophication abatement, and since it is equally clear how far such reduction shall go as a minimum. Even if there are certain exceptions, they do not directly apply to alternatives like the blue mussel alternative.

110. Having come so far, the issue arises whether the very clear wording in the instrumental part of the directive shall take precedence "at all costs", or whether the objective (environmental result) of the directive is sufficient for compliance with the directive, disregarding the instrumental part.

A key issue is *compliance as regards result*. Another key issue is compliance as regards means.

I have taken notice of the difference regarding costs for achieving the prescribed result. Provided that the scientific information and the environmental impact assessments are accurate, it is obvious that the result intended with the directive for coastal waters can be achieved by means of the blue mussel alternative at a much lower cost. Thus, the blue mussel alternative is much more cost-effective than the end-of-pipe solution without compro-

ming with the result.

111. This cost-effectiveness analysis leads to at least two more general EC legal issues, namely competition effects and proportionality.

112. Urban waste water treatment is generally a task for public bodies or authorities (cities, municipalities etc) even if it is possible to let private enterprises take part. Even if the blue mussel alternative is chosen, there will be no relevant negative effects on industrial competition. I have assumed that the fact, that some municipalities will have to allocate more money for end-of-pipe solutions, than will other municipalities which can choose the blue mussel alternative, does not constitute any problem from EC competition law aspects.

113. Principles of proportionality are part of EC law. I have concluded that, provided the same environmental result in relevant aspects (eutrophication abatement), the principle of proportionality very distinctly swings the analysis in favour of approving the blue mussel alternative as a fully EC legally acceptable means for achieving the environmental result and objective of the urban waste water treatment directive.

114. Having arrived at these conclusions, I have turned to the problem of how to *ensure* that the bases for the different conclusions, and the chain of conclusions as a whole, are not obscured in practice. The solution has seemed rather obvious: A test must be designed for assessing and certifying that a blue mussel alternative in a specific case really and fully, and with the same certainty as an end-of-pipe solution, complies with the prescribed result and objective as laid down in the directive *without conflicting with any other EC law or EU objective*.

115. I have designed a proposal for such a test and also proposed a concept called *Full Analogous Compliance (FAC)*. The test includes 5 criteria, all of which must be met in the specific case. Even if only one fails to be met in a specific case, then the blue mussel alternative in the case in question should not be considered acceptable from EC law points of view as a means for complying with the directive. This test is the subject for chapter 4 of this document.

116. Carrying out this FAC test calls for a high quality EIA plus, when appropriate, additional analyses in a licensing procedure. The best alternative would be an EIA which, beside all kinds of impacts and alternatives which are to be assessed in such a procedure and document if it would have been an EIA under the EIA directive, carefully informs about all facts and interrelationships which have to be considered in the FAC test.

117. In the blue mussel alternative concept a quota system is included. The intended function is that dischargers (municipalities etc), instead of applying normal tertiary treatment according to the definition in the directive, fulfill their obligations under the directive by buying quota in mussel farming. A special kind of legal linking between each participating waste water treatment plant and the phosphorus and nitrogen recovery from the sea has to be established. This of course calls for a sufficient and appropriate national legal framework.

Among other reasons, this must be accomplished in order for the blue mussel alternative to be legally secure as an alternative to end-of-pipe tertiary treatment. How the legal framework around the agreements between quota buyer and mussel farmer has to be constructed might be a special issue. However, from EC legal points of view it does not matter how this is done, provided such licensing which I mention in the next paragraph.

118. My task has not included making proposals for how Swedish and Norwegian law should be constructed in order to meet this requirement. Generally, and now I only take Sweden as the example, it seems absolutely necessary to expand the interpretation and/or application of the environmental code (*miljöbalken*) so as to regard a blue mussel plant solution as an abatement *measure* which is part of the operation of the municipal plant, for which there is a requirement on tertiary treatment according to the directive.

This means that the waste water treatment plant, or the discharge from it, has to be re-licensed one way or another in the same way and with the same procedure, as if the plant in question was going to be technically changed and/or there was a change in the waste water discharge. Then, in the license, sufficient conditions should be included calling for sufficient quota rights in one or more operative mussel farms, all of which are situated in an area near the end of the pipe so that the mussel farming behind these

quotas meets the FAC test. Furthermore, a license should not be possible to issue without the applicant (i.e. the waste water treatment plant operator) having produced sufficient proof of legally valid quotas.

As for Sweden, there is at least one previous example which could be used as a model, namely licensing of big animal farms (like for pigs or chicken) where the applicant has had to produce valid contracts with landowners (farmers) on whose farming land the manure could and should be spread according to environmental criteria. This should be a sufficient example for present Swedish licensing authorities to apply *mutatis mutandis*.

119. Then there is the issue of the mussels farmed and taken ashore. The directive addresses sludge issues from tertiary treatment. The mussels are not supposed to constitute waste, but if they for some reason can not be marketed, or used in other commercial ways, the final disposal of them, (or the final use of them as fertilizers or whatever) must be controlled.

In order not to jeopardize the full analogous compliance with the directive, this issue ought to be linked all the way back to the license for the waste water treatment plant, meaning that if something fails *after* the mussels are harvested, so that the objective of the directive is not fully achieved, then this should mean that the conditions of the license for the waste water treatment plans is no longer valid. This should not prohibit full liability for the mussel farmer.

120. What was mentioned in 118 does not preclude the need for the mussel farm also to be licensed if national law says so. But that only depends on whether national has rules on licensing on such plants. From EC law points of view, licensing related to the waste water treatment plant should be sufficient provided that the collecting and use or disposal of the mussels are adequately controlled.

2. Environmental background in brief

This chapter is very elementary and summarises the understanding of some basic, probably relevant, environmental facts related to marine water eutrophication, upon which this assessment initially was based. For reasons due to the task assigned (assessing the blue mussel alternative from EC law points of view), the focus is on marine environment.

201. The environmental situation of marine waters is considered to be very poor because of severe, increasing antropogen pollution. The oceans are the final recipients for much of the substances introduced into the environment by mankind. The marine environmental quality is then affected. Eutrophication is part of the quality problem, especially in the marine waters close to the coasts including such sea areas as the North Sea. Phosphorus and nitrogen are 'nutrients' behind this eutrophication.

202. Ecological changes and degradation because of eutrophication have been observed for quite some time, even if probably much remains to be understood as regards the interaction between different factors. Biodiversity is affected in many ways.

203. Coastal zones are under severe stress because of human activities. Coasts seem to function as some kind of demographically – and consequently environmentally – overheated interface between land related activities and human use of the sea. This is probably why *Coastal Zone Management* has not only become a commonly used term, but also is the object of legislating measures in more and more countries.

204. Phosphorus is an elementary substance with special properties, since phosphorus is absolutely necessary for the growth of organisms, and since it can not be substituted.² Phosphorus can *not* be presumed to return from the

² The environmental legal implications of this is elaborated by *Jonas Christensen* in his doctoral dissertation *Rätt och kretslopp* (Iustus Förlag, Uppsala 2000).

sea through the hydrological cycle, since phosphorus can not evaporate. Except for what comes back from the sea with fish and other products harvested from the sea, and with the birds etc, the introduction of phosphorus into the sea is mainly a one-way affair.

205. Nitrogen is another matter in many respects. It is as an elementary compound a component of the atmosphere. Biological processes can use this nitrogen and turn it into nitrates which in turn can function as nutrients. Such nitrates, when emitted by humans into the environment, can by means of denitrification processes partly decrease – for example when emitted into a freshwater stream far from the coast, the downstream transport towards the coast may "take care of" some of it. The longer it takes and depending on different ecological conditions, denitrification processes can reduce the amounts before reaching the coast.

206. There seems to be some disagreement between natural scientists regarding whether phosphorus or nitrogen is the key substance behind eutrophication effects in marine waters. The EC urban waste water directive and other EC directives include nitrates as significant pollutants. Phosphorus has probably been more widely recognized as a primary eutrophication pollutant in the 1960:s and 1970:s and the nitrogen issue seems to have evolved later. This is probably the main reason behind the fact that when sewage water has been dealt with in treatment plants, phosphorus has been the target when the treatment has gone further than only mechanical and biological treatment. The EC Urban Waste Water directive aims at measures concerning both total phosphorus and total nitrogen.

207. Pollution comes from point sources and non-point sources. A typical point source is a factory discharge, the discharge from a city and a waste dump. Typical non-point sources include farming land, roads (run-off water) etc. Direct dumping into the sea is another type of introduction. The same is true for discharge and other spills from ships and from navigation accidents. But also normal operation of industrial plants (especially the burning of fuels), cars, ships and other vessels at sea, and aircraft contribute to the nitrate loads in the environment and thus also on the sea.

208. The Baltic Sea with its brackish water has proved to be severely

eutrophicated since rather long. Whether phosphorus or nitrogen is the crucial substance in different parts of this marine water is, as far as I understand, still a matter of some scientific dispute. For the North Sea, it seems that total nitrogen has been considered by many as especially problematic.

To an environmental lawyer it seems, however, that there is a problem if and when focusing mostly on nitrogen, namely that certain types of blue-green algae can take nitrogen out of the atmosphere and that way increase the concentration of nitrates in the sea water. On the other hand, such facts – if correctly understood here – would not change the legal analysis of the EC urban waste water treatment directive in the context of this study. It is based on the fact that the directive aims at very substantial reduction of both total phosphorus and total nitrogen.

209. In the EIA documents this, and much more, is elaborated. As I have stated in the first chapter, I have relied heavily on i.a. the natural scientific information produced by Nordic Shell. However, if I have misunderstood something of that, the blame is on me.

Later in this assessment, the issue of location for mussel farms as alternatives to end-of-pipe solutions is brought to the surface. I should make very clear that many Swedish coastal discharges of urban waste water includes pipes more or less far out from the shore and ending more or less deep. Such arrangements are not in conflict with EC law. The total impact of the blue mussel alternative should, therefore, not be compared with discharges at the shoreline. This gives some room when assessing the risk for nearby primary production with a mussel alternative as compared to an end-of-pipe solution.

210. On the other hand, waste water discharges into freshwater sensitive areas can not be compensated by means of the blue mussel alternative, since the mussel farms will be situated far from the end-of-pipe discharge of waste water which only has been treated up to the level of secondary treatment. So, unless very substantial additional environmental and natural scientific information indicates otherwise, the blue mussel alternative today can only be contemplated and considered as a hypothetical and also possible alternative for waste water treatment plants situated at the coast, or with their pipe ends in coastal water.

3. The urban waste water treatment directive in brief in perspective of this analysis

This chapter is, like the second chapter, very elementary. It is intended to serve as an overview for those who are not familiar with the directive. The overview is made with special attention to those rules in the directive which might have, directly or indirectly, significance for assessing how the blue mussel alternative stands with respect to EC law.

301. The directive 91/271/EEC was amended in 1998.

"The objective of the directive is to protect the environment from the adverse effects of [urban waste water] discharges."

The objective of the directive is quite clearly related to water pollution problems due to the discharge of urban waste water. This means domestic waste water, mixtures of domestic waste water with industrial waste water, and/or run-off (rain) water. In this respect, the directive is *environmental problem related*.

302. The core of the environmental problem, as viewed through the objective of the directive, is *eutrophication* – mainly caused by total nitrogen and/or phosphorus. This objective is not directly health related. Thus, the directive is not really a public health directive.

303. Public health is on the other hand included in the objectives of the bathing water directive and – at least indirectly – the shellfish water directive. Public health is also part of the objective of the water framework directive. When the receiving water is freshwater, public health is also part – and an important one at that – of the objective of the directive on water to be extracted for drinking water purposes.

304. The urban waste water treatment directive is very specific regarding the means to be taken in order to manage this environmental, urban waste water related problem (the *instrumental* side of the directive). It distinguishes between three main types of *areas*, one of which is *sensitive areas* which constitute the type of area relevant for this analysis.

305. Art 3 requires collecting systems for urban waste water, with some different deadlines depending on the size of the population equivalent. It applies to agglomerations (concentrated population and/or economic activities as defined in art 2.4) of certain magnitudes.

This article contains one possible exception regarding the establishment of a collecting system. If any of the following two criteria is met, this exception applies:

- (a) The collecting system would produce no environmental benefit.
- (b) The collecting system would involve excessive cost.

When this exception applies, individual or "other appropriate systems which achieve the same level of environmental protection shall be used".

306. Art 4 applies to discharges from collecting systems of certain magnitudes into receiving waters in general, whether coastal or inland waters. It prescribes the normal standard for most urban waste water discharges: *secondary treatment*, meaning mechanical and biological treatment resulting in certain reductions or more of total phosphorus and nitrogen.

It contains one exception, namely for urban waste water discharges in high mountain areas where it is difficult to apply an effective biological treatment due to temperature reasons. Then the treatment may be less stringent than the normal primary and secondary treatment otherwise generally prescribed in the article, but only "provided that detailed studies indicate that such discharges do not adversely affect the environment".

307. Art 5 applies to urban waste water discharges in *sensitive areas* and also includes discharges from plants "situated in the relevant catchment areas and which contribute to the pollution of (the sensitive) areas". This article is a corner stone for the problem behind this analysis. Here, the main rule is that urban waste water discharges shall be subject to more stringent treatment than the secondary treatment under art 4. I have chosen to call it *tertiary treatment* although that concept is not included in the definitions of the directive. The requirements are formulated in Annex I B. They apply to agglomerations of more than 10.000 p.e. (Smaller agglomerations are regulated in art 7).

The requirements can be amended with reference to the procedure under art 18.

308. The article contains not an exception, but an *alternative*. The tertiary treatment requirements for individual plants need not apply "where it can be shown that the minimum percentage of reduction of the overall load entering all urban waste water treatment plants in that (sensitive) area is at least 75 % for both total phosphorus and total nitrogen". Instead, secondary treatment is sufficient.

309. Art 6 applies to less sensitive areas (there is some connection between this article and art 8.5).

310. Art 7 applies to smaller collecting systems from which the discharge into fresh-water and estuaries from agglomerations is less than 2.000 p.e, and into coastal waters from agglomerations is less than 10.000 p.e. Here *appropriate treatment* is required, meaning treatment of waste water "by any process and/or disposal which after discharges allows the receiving waters to meet relevant quality objectives" and relevant EC law provisions.

311. Art 8 gives some room for a longer period for complying with the requirements set out in art 4 (secondary treatment in areas which are not sensitive). Only technical reasons are legitimate.

Art 8 also regulates some exceptional circumstances regarding major discharges into less sensitive areas.

312. Art 9 concerns when two or more member states are affected by urban waste water discharges.

313. Art 10 calls for the urban waste water treatment plants to be designed, constructed, operated and maintained to *ensure* sufficient performance "under all normal local conditions". Seasonal variations of the load shall be taken into account.

314. Art 11 calls for prior regulations and/or a licensing requirement for the discharge of industrial waste water into collecting systems and urban waste water treatment plants. More precise details are laid down in Annex I C.

315. Art 12 states that treated waste water shall be re-used whenever appropriate. Prior regulations and/or a licensing requirement shall apply to

the disposal of waste water from urban waste water treatment plants.

316. Art 13 seems exclusively to apply to certain categories of biodegradable industrial waste water (as listed in Annex III) , which is not discharged into collecting systems for urban waste water, and where the discharge from the plant is equivalent to 4.000 p.e. or more.

317. Art 14 concerns *sludge* from waste water treatment. It shall be re-used whenever appropriate. The disposal of sludge from urban waste water treatment plants shall be subject to general rules, registration or authorization.

318. Art 15 deals with requirements on monitoring by competent authorities or appropriate bodies.

319. Art 16 calls for situation reports to be published every two years on the disposal of urban waste water and sludge.

320. Art 17 states that each member state shall establish a programme for the implementation of the directive.

321. Articles 18 – 20 are peripheral to this analysis.

4. Analogous compliance and an FAC test

Based on the fact that the directive defines its objective to be to protect the environment from the adverse effects of urban waste water and similar waste water discharged, and referring to the proportionality principle – as elaborated in the first chapter – I have concluded that the instrumental part of the directive is not part of the objective, which in turn would make it reasonable from EC law points of view to accept also the blue mussel alternative as a valid alternative under a number of conditions, all of which are related to the objective of the directive and to certainty. In order to accomplish such a result, I have proposed a concept of Full Analogous Compliance (FAC) and designed an FAC test to be carried out in each individual case.

Normal compliance with EC law

401. The addressees of an EC directive such as the 1991 urban waste water treatment directive are primarily the member states. The first step for the member states to take is to *transpose* the directive into domestic law. The next step includes that the domestic law, after the transposition, must be applied in a way that is compatible with the EC law in question, also taking account i.a. the European Court of Justice case law. Furthermore, if strict application by the letter is not sufficient for achieving the *result(s)* which are aimed at, according to the directive, the member state in question has to take additional measures leading to the accomplishment of the directive related results.

402. A satisfactory implementation does not necessarily mean that the wording of the directive – word by word – is transposed. On the other hand, the resulting domestic law after the transposition must be quite clear regarding everything, that the directive prescribes. This includes i.a. that the domestic law must not allow for an action or a measure, which is not possible to interpret from the directive, if the directive states that other types of actions or measures are to be taken. *Legal certainty* is a key concept when analysing whether a national implementation is sufficient or not.

403. All EC directives are very important sources of law. However, every directive must be considered as a component in a larger *legal system*, namely

the entire EC law including the Treaty, and including such international law, that is to be applied by EU, and common legal principles of the Rule of Law. Therefore, when examining a specific directive, the primary material is of course the text of this directive and relevant case law. But the preliminary conclusions from such an examination must be checked against the entire legal system, in order to put the specific directive in perspective and in its systemic context. If this is not done, then the application of the specific directive might conflict with even very fundamental law and legal principles.

404. On the other hand, such systemic and contextual examination must be very theoretically disciplined. For example, if the objective of the directive is clear, any systemic and/or contextual examination that seems to result in jeopardizing the achievement of this objective, must be *presumed* to be wrongful.

405. If a member state has implemented the directive poorly (which is not unusual in the environmental area when it comes to i.a. Sweden), or if by mistake the national legislation raises doubts as to what is really the law, then the directive – even when it does not have direct effect – shall be used in order to steer the national application of the law in a direction that is compatible with the directive. Such *indirect effect* is very important and it is also part of EC law. Therefore, any national measure and/or application of (national) law which might lie, partly or wholly, within the scope of the directive, must be checked against the directive whenever there is a doubt about the full compatibility between the national law or the national application on one hand, and EC law on the other hand.

The blue mussel alternative

406. The background for this study is an explicit project idea aiming at introducing a quota system for especially total nitrogen causing eutrophication of surface water, in this case marine water.

It is quite obvious that this *alternative* is not forecasted or *explicitly* provided for in the 1991 directive. On the other hand, according to information included in i.a. an EIA, and information given to me, this

alternative is claimed fully to achieve at least the same result as that intended in the objective of the directive.

407. The environmental consequence information is the responsibility of others than me. This study is based on the assumption that the environmental consequence information is correct. The only type of "interference" from me concerning environmental consequences will be that some criteria are suggested in order to improve certainties about how the alternative stands in the light of the 1991 directive.

408. As mentioned in 406, the blue mussel alternative does not fit into the wording of the directive, especially as regards the *instrumental* part of the directive (i.e. the articles laying down which measures that are to be taken in order to achieve the intended results concerning the protection of marine water quality). On the other hand, the blue shell alternative fits perfectly into the *environmental result* objective of the directive (provided the assumption mentioned in 407).

409. The dilemma of 408 is posed to me as a fundamental problem. Just throwing the dilemma away by stating that since the wording of the directive does not explicitly include this kind of alternative, EC law does not give room for this alternative, would perhaps satisfy those who only apply directives and EC law by the letter without systemic and contextual analysis.

On the other hand, merely stating that since the result would be compatible with the environmental objective of the directive, the blue mussel alternative would be perfectly legal even in an EC context, would mean that the normal "article by article" analysis of directives would be set aside without further explanation.

410. The dilemma of 408 cannot be solved in the ways mentioned in 409 without some serious implications.

One such implication would be that if an article by article compliance always is mandatory, the environmental directives would easily become counter-productive to their own objectives whenever science or technology is improved.

Another implication (from the second paragraph of 409) might be that an objective is the only component in a directive, that is relevant for

implementation, namely if we stated that since the result would be compatible with the environmental objective of the directive, then the alternative is legal. This would endanger the mechanisms of assessing, and enforcing, the full national implementation of EC directives since it easily could give too much room for foot-dragging member states who do not hesitate from pretending that their measures are sufficient for the objective, thereby placing the burden on the Commission to bring the issue to the European Court of Justice.

A concept of Full Analogous Compliance (FAC)

411. This study tries to make the dilemma disappear by introducing a concept of *Full Analogous Compliance (FAC)* and an FAC test.

The concept of FAC is satisfied when the situation, or alternative

a) will result in *at least* the same or equivalent factual result as would an "article by article" compliance, with respect to the objective(s) of the directive,

b) and this must be accomplished without counteracting any other objective of any other EC directive,

c) and without jeopardizing any legal right for any person derived from EC law,

d) and without jeopardizing any human rights according to international law,

e. and also without counteracting any fundamental EC legal principle.

The FAC test for is dealt with in 418 et seq.

412. It may be that this is nothing new and that I have overlooked what has been written by others, or concluded by the European Court of Justice, leading to the same idea. Be that as it is. This study relies heavily on this concept. It is not that I claim FAC to be sufficient for a member state to proceed with alternatives which are not *explicitly* provided for in a directive. But provided that an alternative meets any reasonable FAC test, then the alternative could be considered as a legitimate implementation of the directive, at least after consultations with the Commission.

413. From 411 and 412 follows that any argument in this study in favour

of a solution or an alternative only refers to whether it meets a reasonable FAC test, not to whether the solution or alternative is in *direct* compliance with the *wording* of the directive.

414. Generally speaking, the basic reason for analysing what would be required for FAC in connection with the blue mussel alternative is as follows.

415. The blue mussel alternative is (according to the information referred to in 406) significantly less costly than an end-of-pipe solution that goes further than secondary treatment. If this is correct, and provided that FAC is accomplished, it would constitute a significant proportionality problem if the end-of-pipe solution takes over only because of the wording of the instrumental part of the directive.

416. On the other hand, if analogous compliance is accomplished, but the compliance is *less than full*, and the blue mussel alternative is much less costly, it could not be argued that it is a legally relevant or appropriate matter of proportionality whether to go for the end-of-pipe solution prescribed in the wording of the directive, or the blue mussel alternative (not even if the difference in environmental result is small but the cost difference is very big) since that would jeopardize the environmental objective(s) of the directive.

417. However, in this study this is not a problem according to the information referred to in 406. The environmental result from the blue mussel alternative is claimed to be at least as good as the result from an end-of-pipe solution. Therefore, we do not have to discuss the merits and problems with balancing costs against environmental results (and if we should do that, I would argue that the directive does not give general room for lowering the mitigation measures because their cost would be unproportional to the result).

The FAC test

418. So, having stated that the environmental result from the alternativ

must not be inferior to the result from the end-of-pipe solution provided for in the directive, the criteria for Full Analogous Compliance have to be defined.

I have arrived at the following FAC criteria:

No 1: At least the same extraction of total phosphorus and total nitrogen from the same water area as the one, that would be freed from total phosphorus and total nitrogen by means of an end-of-pipe solution going further than secondary treatment. This is commented upon in 419.

No 2: No significant primary production because of the direct discharge after secondary treatment plus the blue mussel alternative as compared to the primary production after an end-of-pipe solution going further than secondary treatment. This is commented upon in 420.

No 3: No other significant environmental quality impact because of the difference between secondary treatment plus the blue mussel alternative as compared to an end-of-pipe solution going further than secondary treatment. This is commented upon in 421.

No 4: No conflict with the Water Framework directive as regards environmental quality, or with other EC law, if the blue mussel alternative is chosen instead of an end-of-pipe solution going further than secondary treatment. This is commented upon in 422.

No 5: No negative binding effect on the possibilities for further ecological improvement of the water area because of choosing the blue mussel alternative as compared to an end-of-pipe solution going further than secondary treatment. This is commented upon in 423.

419. Criterion No 1 calls for the following:

1. Accurate, legitimate monitoring.
2. Full certainty that the handling of the mussels after harvesting will not cause phosphorus and/or nitrogen once more to return to the water environment, except as a substitute for another amount of substance with phosphorus and/or nitrogen.
3. A sufficient legal framework that controls the blue mussel alternative, that kicks in if a blue mussel plant ceases to function, or is not properly harvested, or otherwise is taken out of operation.

420. Criterion No 2 means that even if a sufficient amount of phosphorus and nitrogen is taken back from the water, FAC is not achieved if other negative

impact occurs because of primary production in the water area "before" the nutrients have been "picked up" in the blue mussels. In order to meet this criterion, the blue mussel plants must be located not very far from where the end-of-pipe would be situated. Generally, this criterion reduces the blue mussel alternative to be relevant only for coastal discharges.

What is now mentioned co-incides with criterion #4, since the Water Framework directive could be understood as aiming at a good water quality, and this might be counteracted by a solution where the blue mussel plant is situated so far from where the end-of-pipe site is, or would be, located, so that extra primary production might occur in the water before the blue mussel plant.

421. Criterion No 3 is not necessarily related to the 1991 directive but is more or less self-evident because of other environmental directives, some of which will be replaced within the framework of the Water Framework directive, and others of which are standing on their own (as the Bathing Water directive). However, other kinds of negative impact, not related to water quality and not subject to the objective of EC directives, such as physical obstacles for commercial or leisure vessels etc (not being subject to EC law), could be accepted *from EC law points of view* (since FAC only relates to EC law implementation). These issues are purely a matter of and for national law.

422. Criterion No 4 is self-evident from EC law points of view (also mentioned in 420).

423. Criterion No 5 is derived from the understanding of the Water Framework directive which, without limiting the scope of instruments and strategies for water quality, broadly aims at improving water quality and maintaining a sufficiently good quality. Since coastal areas most probably will be subject to even more pressure in the future, the risk is evident that the water areas also will be under more pressure, the result of which must include different measures and strategies for counteracting such threats. In other words, even blue mussel alternatives must be part of *sustainable* solutions (or at least not less sustainable than an end-of-pipe solution going further than secondary treatment) and if such alternatives would lead to irreversible lockings, the Water Framework context would cause this alternative not to be FAC.

Concluding discussion about FAC and the test

424. Provided that this test is carried out properly based on an appropriate EIA

document and possibly additional material, and thus that all five criteria have been demonstrated to be met, then a blue mussel alternative will with sufficient certainty fully accomplish everything that is intended in the directive, judging from the explicit objective of the directive as stated in its article 1 as being "to protect the environment from the adverse effects of the abovementioned³ waste water discharges".

425. In the first chapter of this document, this is elaborated and then i.a. put up against the principle of proportionality and also taken further to considerations concerning licensing procedures and other measures in order really to ensure a continuous full analogous compatibility.

³ In the first paragraph of the same article.