

**PROPOSAL FOR AMENDMENTS**

**BY EUROGEOSURVEYS  
THE ASSOCIATION OF THE GEOLOGICAL SURVEYS  
OF THE EUROPEAN UNION**

**AND SUPPORTED BY THE EUROPEAN FEDERATION OF GEOLOGISTS**

**On the Proposal for a  
DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
establishing a framework for the protection of soil and amending Directive 2004/35/EC**

**COM(2006) 232 final  
2006/0086 (COD)**

The member organisations of EuroGeoSurveys are:

Centre de Recerca en Ciències de la Terra, Andorra

Geological Survey of Austria, Austria

Geological Survey of Belgium, Belgium

Subsurface and Underground Resources Office, Bulgaria

Hrvatski geološki institut – Croatian Geological Survey, Croatia

State Geological Survey of the Republic of Cyprus, Cyprus

Czech Geological Survey, Czech Republic

Danmarks og Grønlands Geologiske Undersøgelse, Denmark

Eesti Geoloogiakeskus, Estonia

Geological Survey of Finland, Finland

Bureau des Recherches Géologiques et Minières, France

Bundesanstalt für Geowissenschaften und Rohstoffe, Germany

Institute of Geology and Mineral Exploration, Greece

Geological Institute of Hungary, Hungarian Geological Survey, Hungary

Iceland GeoSurvey, Iceland

Geological Survey of Ireland, Ireland

Italian Agency for Environmental Protection and Technical Services, Italy

Latvian Environment, Geology and Meteorology Agency, Latvia

Geological Survey of Lithuania, Lithuania

Service Géologique du Luxembourg, Luxembourg

Netherlands Institute of Applied Geoscience TNO, National Geological Survey, The Netherlands

Norges Geologiske Undersøkelse, Norway

Polish Geological Institute, Poland

Instituto Nacional de Engenharia, Tecnologia e Inovação, Portugal

Geological Institute of Romania, Romania

A. P. Karpinsky All Russia Geological Research Institute, Russian Federation

Štátny geologický ústav Dionýza Štúra, Slovakia

Instituto Geológico y Minero de España, Spain

Sveriges Geologiska Undersökning, Sweden

Swisstopo Bundesamt für Landestopografie Landesgeologie Leiter Geologische Landesaufnahme, Switzerland

British Geological Survey, United Kingdom

## **Rationale for the amendments proposed by the Member Organisations of EuroGeoSurveys**

The Member Organisations of EuroGeoSurveys have extensive experience in the field of natural resources (including soils, minerals, energy and water), the sustainable development and utilisation of the subsurface, physical and chemical hazards, environmental management, knowledge transfer and the collection, development and supply of environmental data. Our experience covers the spatial extents of the European Union and its associated landscapes and climatic and economic zones. As a collection of geological surveys, earth science and environmental institutes, our aim in commenting on and proposing amendments to the proposal for a directive of the European Parliament and of the Council, establishing a framework for the protection of soil and amending Directive 2004/35/EC, as presented by the Commission of the European Communities (COM(2006)232 final), is to provide expert, neutral, balanced and practical pan-European feedback on the proposal.

In doing this, the EGS Soil Working Group would formally like to express their strong support for the overarching aims and objectives that underpin the drafting of this Directive as outlined in the context of the proposal [Explanatory memorandum (Section 1)], particularly in the context of the profound changes that will influence Europe's near surface environment and landscapes over the coming decades, as a result of climate change, changes in land use and associated socio-economic and societal pressures. We particularly welcome linkages made with other Community Directives (in which EGS continue to make a significant scientific and knowledge based contribution) and the acknowledgement that a common

strategy to soil protection is both timely and entirely appropriate within the context of the sustainability of the European environment as a whole. Furthermore, we support the Directive's assertion that the eight main threats to European soil encompass erosion, organic matter decline, contamination, salinisation, compaction, soil biodiversity loss, sealing, landslides and flooding.

We are, however, extremely concerned that as a community, representing the broad spectrum of disciplines constituting the Earth Sciences (including in some cases a direct responsibility for soil survey and research) from across the European Union that the discipline of Geology (and associated sub disciplines of hydrogeology, mineralogy, geochemistry, geophysics and remote sensing) appears to have been excluded from the Domains of scientific expertise concerned (page 4 – collection and use of expertise, Chapter II (Risk prevention, mitigation and restoration) and in Annex 1). Whilst we acknowledge the prominence, quite rightly given to soil science, the apparent exclusion of the discipline of geology undervalues, by a significant margin, the skills, research capacity and knowledge that the European Commission, and its proposed Directive, can draw upon in its development and successful implementation.

In drafting our comments we have attempted to: (a) make comments from the perspective of technical capability and capacity, policy sustainability and scientific evidence, and (b) to draw together into an agreed form individual comments from our member institutions. Wherever possible we have suggested specific amendments to the Directive's text, along with the specific discussion and/or justification associated with each proposed change.

### **Support by the European Federation of Geologists to the amendments**

The European Federation of Geologists has contributed to the amendments as presented in this document, in addition to their document presented in April 2007 and their comments discussed in meetings with the European Commission. It supports the content of these amendments to the proposal for the Directive on Soil protection.

The European Federation of Geologists represents more than 40,000 European professional geologists, ranging from national geological surveys to universities and from individual consultants to geologists working for commercial companies. The European Federation focuses on the geological profession and on increasing the awareness of the importance of geology in our society.

## AMENDMENTS PROPOSED

### Amendment 1

Chapter 1) “CONTEXT OF THE PROPOSAL”, - “Grounds for and objectives of the proposal”, paragraph 1

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| Soil is essentially a non-renewable resource and a very dynamic system which performs many functions and delivers services vital to human activities and ecosystems survival. Information available suggests that, over recent decades, there has been a significant increase of soil degradation processes, and there is evidence that they will further increase if no action is taken. | Soil is essentially a non-renewable resource and a very dynamic system which performs many functions and delivers services vital to human activities and ecosystems survival. Information available <del>suggests</del> <b>provides evidence</b> that, over recent decades, there has been a significant increase of soil degradation processes, and there is evidence that they will further increase if no action is taken. |

#### Justification

It is important to underline the very complex nature of soil, which is a result of the interaction between variable local conditions and factors.

The work carried out by the different task groups of the EC Environment Directorate’s “*Towards a Thematic Strategy on Soil Protection*” and the European Soil Bureau, as well as the State of the Environment reports of the European Environmental Agency, ‘provide evidence’ (not ‘*suggest*’) that ‘*there has been a significant increase of soil degradation processes*’. ‘**provides evidence**’ is more positive than ‘suggests’ and makes the point that there is an evidence base for this statement.

## Amendment 2

Chapter 1) “CONTEXT OF THE PROPOSAL”, “General context”, paragraph 1

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| Soil is under increasing environmental pressure across the Community, driven or exacerbated by human activity, such as inappropriate agricultural and forestry practices, industrial activities, tourism or urban development. These activities are damaging the capacity of soil to continue to perform in full its broad variety of crucial functions. Soil is a resource of common interest to the Community, although mainly private owned, and failure to protect it will undermine sustainability and long term competitiveness in Europe. Moreover, soil degradation has strong impacts on other areas of common interest to the Community, such as water, human health, climate change, nature and biodiversity protection, and food safety. | Soil is under increasing environmental pressure across the Community, driven or exacerbated by human activity, such as <del>inappropriate</del> agricultural and forestry practices, industrial activities, tourism or urban development. These activities are damaging the capacity of soil to continue to perform in full its broad variety of crucial functions. Soil is a resource of common interest to the Community, although mainly private owned, and failure to protect it will undermine sustainability and long term competitiveness in Europe. Moreover, soil degradation has strong impacts on other <del>socio-economic</del> areas of common interest to the Community, such as water, human health, climate change, nature and biodiversity protection, and food safety. |

### Justification

Agricultural or forestry practices whether inappropriate or appropriate exert pressure on soil. Therefore, the proposal is to erase ‘inappropriate’.

Addition of ‘socio-economic’ areas defines appropriately the social and economic impacts of soil degradation.

### Amendment 3

Chapter “2) Consultation of interested parties and impact assessment - Collection and use of expertise“ paragraph 1

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| Soil science, agronomical science, forestry, hydrology, biology, ecology, economy, social science, political science. | Soil science, agronomical science, <b>geology, geomorphology, geochemistry, chemistry,</b> forestry, hydrology, biology, ecology, economy, social science, political science. |

#### Justification

According to the topics dealt with by the proposed Directive, geology, geomorphology, geochemistry and chemistry are definitely among the main scientific domains concerned directly or indirectly with soil development and the assessment of its quality. The overall document would be incoherent if they were not mentioned here. It is stressed that this is a significant statement, which highlights the importance of cross disciplinary involvement. There will be much time wasted reinventing the wheel and, more especially, many of the advantages of cross linking between the Soil Framework Directive and other Directives in which these wider disciplines are also involved. It is also worth pointing out that (a) many soil surveyors and soil scientists started with a first degree in chemistry and/or geology, and (b) not all countries have organisations in which the disciplines of soil and geology are integrated enough to enable cross-cutting issues with the Water Framework Directive to be fully developed. Soil science, without the involvement of other earth science disciplines, and the idea of ‘geology’ happening hundreds of metres below our feet, over time scales of millions of years, is an outdated view. Therefore, the Directive should insist on the collaboration of all disciplines concerned with different aspects of soil.

## Amendment 4

Chapter "3) Legal elements of the proposal - subsidiary principle", paragraph 3

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| <p>Soil degradation in one Member State or region can have transboundary consequences. Indeed, dams are blocked and infrastructure is damaged downstream by sediments massively eroded in another country farther upstream. Equally, groundwater bodies flowing through bordering nations can be polluted by contaminated sites on one side of the border. Losses of soil organic matter in one Member State can impair the achievement of the Kyoto protocol targets by the Community. This would imply that the costs to restore environmental quality are borne by a Member State different from that where the soil degrading practice occurred.</p> | <p>Soil degradation in one Member State or region can have transboundary consequences. Indeed, dams are blocked and infrastructure is damaged downstream by sediments massively eroded in another country farther upstream. Equally, groundwater bodies flowing through bordering nations can be polluted by contaminated sites on one side of the border. <del>Losses of soil organic matter in one Member State can impair the achievement of the Kyoto protocol targets by the Community.</del> Losses of soil organic matter in one Member State can impair the achievement of current and future greenhouse gas emission reduction targets, including those of the Kyoto Protocol. This would imply that the costs to restore environmental quality are borne by a Member State different from that where the soil degrading practice occurred.</p> |

### Justification

The current phrasing is not correct, as the Kyoto Protocol should not be used as a reference target in this case, because it has a limited time span and allows signatories parties to use the agricultural option in mitigation strategies. The proposed phrasing is more appropriate for Community policy, extending beyond the Kyoto Protocol time frame.

## Amendment 5

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 4

| Commission text   | Amendments Proposed by EGS   |
|---|--|
| <p>4) The Communication of the Commission to the European Parliament and the Council “Towards a Thematic Strategy on Soil Protection”<sup>6</sup> identifies the main eight soil degradation processes to which soils in the EU are confronted. These are erosion, organic matter decline, contamination, salinisation, compaction, soil biodiversity loss, sealing, landslides and flooding. The current scientific knowledge on soil biodiversity and its behaviour is too limited to allow for specific provisions in this Directive aiming at its protection. The prevention and mitigation of the effects of floods have been addressed by the proposal for a Directive of the European Parliament and the Council on the assessment and management of floods<sup>7</sup>.</p> | <p>4) The Communication of the Commission to the European Parliament and the Council “Towards a Thematic Strategy on Soil Protection”<sup>6</sup> identifies the main eight soil degradation processes to which soils in the EU are confronted. These are erosion, organic matter decline, contamination, salinisation, compaction, soil biodiversity loss, sealing, landslides and flooding. <del>The current scientific knowledge on soil biodiversity and its behaviour is too limited to allow for specific provisions in this Directive aiming at its protection.</del> The current scientific knowledge on soil biodiversity, and its ecological role in biogeochemical cycles are not sufficiently supported by general criteria and shared methods, tested in an environmental monitoring network. Specific and comprehensive provisions in this Directive aiming at soil biodiversity protection can only be partial. They include the identification of pilot areas to apply and validate the diagnostic procedures, and the development of a monitoring network of experts to implement these provisions. The prevention and mitigation of the effects of floods have been addressed by the proposal for a Directive of the European Parliament and the Council on the assessment and management of floods<sup>7</sup>.</p> |

### Justification

The sentence proposed to be deleted is in contrast with the **Preventive Action Principle** (*Where there are threats of serious irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*) and the **Precautionary Principle** (*When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established. In this context, the proponent of an activity rather than the public should bear the burden of proof. The process of applying the Precautionary Principle must be opened, informed, and democratic and must involve*



*potentially affected parties. The process must include a comprehensive, systematic examination of the full range of alternatives, including no action) on which EU environmental legislation lies (art 174 (2) of the EU Treaty). Moreover, not to take the opportunity to increase our knowledge on soil biodiversity would represent an embarrassing failure of EU environmental policy. The Directive should therefore, consider soil biodiversity loss. However, identification of soil degradation processes caused by this threat should be carried out in *pilot areas*.*

## Amendment 6

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 5

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| 5) Soil variability is very high in the Community and enormous differences exist in its structural, physical, chemical and biological state both within individual profiles and between soils. These diverse conditions and needs in the Community should be taken into account as they require different specific solutions for the identification of areas at risk, definition of targets and execution of appropriate measures to ensure protection of soil. | 5) Soil variability is very high in the Community and enormous differences exist in its structural, physical, chemical and biological state both within individual profiles and between <b>different soil types</b> . These diverse conditions and needs in the Community should be taken into account, <b>through interdisciplinary investigations</b> , as they require different specific solutions for the identification of areas at risk, definition of targets and execution of appropriate measures to ensure protection of soil. |

### Justification

It is recommended to replace ‘soils’ by ‘different soil types’, since this is a more appropriate description of soil variability.

It is important to stress the need of collaboration between the different disciplines, since this is the only way to find viable solutions.

## Amendment 7

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 6

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| 6) Community legislation, for instance in the fields of waste, chemicals, industrial pollution prevention and control, climate change, water, and agriculture and rural development, includes some provisions on soil protection, but these are neither designed nor sufficient to protect all soils against all degradation processes. Hence there is a need for a coherent and effective legislative framework, providing for common principles and objectives aiming at protection and sustainable use of soil in the Community. | 6) Community legislation, for instance in the fields of waste, chemicals, industrial pollution prevention and control, climate change, water, <b>nature protection, landscape preservation</b> and agriculture and rural development, includes some provisions on soil protection, but these are neither designed nor sufficient to protect all soils against all degradation processes. Hence, there is a need for a coherent and effective legislative framework, providing for common principles and objectives aiming at protection and sustainable use of soil in the Community. |

### Justification

Since, this is a general statement about Community legislation, these two issues, which constitute part of the Habitats Directive, should be included in the text.

## Amendment 8

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 7

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>  |
|---|--|
| 7) Soil should be used in a sustainable manner which preserves its capacity to deliver ecological, economic and social services, while maintaining its functions so that future generations can meet their needs. | 7) Soil should, <b>in principle (commensurate within the general framework and principles of environmental sustainability)</b> , be used in a sustainable manner, which preserves its capacity to deliver ecological, economic and social services, while maintaining its functions so that future generations can meet their needs. |

### Justification

There may be situations, such as costal zone management, where soil and soil function at a given site may need to be sacrificed to protect soil and soil function at other locations. In such cases, the sustainability of soils have to be considered within the wider aspects of environmental sustainability.

## Amendment 9

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 8

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| 8) The aim of this Directive is to ensure the protection of soil, based on the principles of preservation of soil functions, prevention of soil degradation, mitigation of its effects, restoration of degraded soils and integration into other sectoral policies by establishing a common framework and actions. | The aim of this Directive is to ensure the protection of soil, based on the principles of preservation of <b>multi-functionality of soil functions</b> , prevention of soil degradation, mitigation of its effects, restoration of degraded soils and integration into other sectoral policies by establishing a common framework and actions. |

### Justification

The concept of multi-functionality of soil should be one of the principle aims of the Directive.

## Amendment 10

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 13

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| 13) Sealing is becoming significantly more intense in the Community as a result of urban sprawl and increasing demand for land from many sectors of the economy, and this calls for a more sustainable use of soil. Appropriate measures are needed to limit soil sealing, for instance by rehabilitating brownfield sites, thus reducing the depletion of greenfield sites. Where sealing does occur Member States should provide for construction and drainage techniques that would allow as many soil functions as possible to be preserved. | 13) Sealing is becoming significantly more intense in the Community as a result of urban sprawl and increasing demand for land from many sectors of the economy, and this calls for a more sustainable use of soil. Appropriate measures are needed to limit soil sealing, for instance by rehabilitating brownfield sites, thus reducing the depletion of greenfield sites. <b>Member States to take also appropriate measures to avoid further covering of greenfield sites in accordance with the principles laid down in the European Spatial Development Perspective, with the main aim to preserve soil quality, independently of its current and future functions.</b> Where sealing <b>already</b> occurs Member States should provide for construction and drainage techniques that would allow as many soil functions as possible to be <b>restored</b> <del>preserved</del> . |

### Justification

The sealing issue cannot have a low profile and measures to be limited only to “*rehabilitating brownfield sites, thus reducing the depletion of greenfield sites*”. Member States should take also other measures to avoid covering Greenfield sites to preserve soil quality.

Where soil is ‘already’ sealed, Member States should take the necessary measures to ‘*allow as many soil functions as possible to be restored*’, and not ‘*preserved*’, since ‘**restored**’ is more appropriate in this case.

## Amendment 11

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 14

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| 14) A targeted and efficient soil protection policy should be based on the knowledge of where degradation is occurring. It is recognised that certain degradation processes, such as erosion, organic matter decline, compaction, salinisation and landslides, occur only in specific areas which are more at risk of such processes. This requires the identification of such risk areas. | 14) A targeted and efficient soil protection policy should be based on the knowledge of where degradation is occurring. It is recognised that certain degradation processes, such as <b>contamination</b> , erosion, organic matter decline, compaction, salinisation, and landslides, <b>and loss of archaeological and geological heritage</b> , occur only in specific areas which are more at risk of such processes. This requires the identification of such risk areas, <b>including the identification of “pilot areas” at risk of soil biodiversity loss.</b> |

### Justification

‘Contamination’ should be included, because it degrades the quality of soil, and is one of the eight soil degradation processes identified by the task groups of “*Towards a Thematic Strategy on Soil Protection*”.

‘loss of archaeological and geological heritage’ should be included since both are part of the original seventh function of soil.

Risk areas should include those where there is significant risk of soil biodiversity loss, and to be studied at selected ‘pilot areas’.

## Amendment 12

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 15

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| 15) To ensure a coherent and comparable approach in the different Member States, identification of risk areas for erosion, organic matter decline, compaction, salinisation and landslides should be based on a common methodology which includes elements known to be driving forces for the various degradation processes. | 15) To ensure a coherent and comparable approach in the different Member States, identification of risk areas for erosion, organic matter decline, <b>contamination</b> , salinisation, compaction, loss of <b>soil biodiversity, sealing <del>and</del> landslides and loss of archaeological and geological heritage</b> , should be based on common methodologies, which include elements known to be driving forces for the various degradation processes. |

### Justification

This is a statement about methodologies to be applied on the eight soil degradation processes identified by the task groups of “*Towards a Thematic Strategy on Soil Protection*”, and mentioned in Paragraph 4. Therefore, it is appropriate to mention here the eight soil degradation processes.

‘loss of archaeological and geological heritage’ should be included here as well, since both are part of the original seventh function of soil.



### Amendment 13

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 16

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| 16) In the risk areas identified, measures should be taken to prevent further soil degradation by reducing the risk of its occurring and restoring degraded soils in order to preserve soil functions. | 16) In the risk areas identified, measures should be taken to prevent further soil degradation by reducing the risk of its occurring <b>and as far as it is reasonably possible, in the overall context of soil and environmental sustainability, to restore</b> <del>restoring</del> degraded soils in order to preserve soil functions. |

#### Justification

Eight soil degradation processes have been identified by the task groups of “*Towards a Thematic Strategy on Soil Protection*”, and in this paragraph a general statement is made for measures to be taken to prevent further soil degradation, but also to restore degraded soils. This is almost an impossible task where erosion, compaction, landslides and salinisation are concerned. Therefore, it is appropriate to include the above statement.

## Amendment 14

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 19

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| 19) This Directive should contribute to halting desertification, which results from concurrent degradation processes, and soil biodiversity loss, and enhance cooperation in the implementation of the United Nations Convention to Combat Desertification and the Convention on Biological Diversity to which the Community is a party, and will enhance the implementation of these international environmental agreements. | 19) This Directive should contribute to <del>halting</del> combating desertification, which results from <del>concurrent</del> human-induced accelerated degradation processes, and soil biodiversity loss, and enhance cooperation in the implementation of the United Nations Convention to Combat Desertification and the Convention on Biological Diversity to which the Community is a party, and will enhance the implementation of these international environmental agreements. |

### Justification

The phrasing of this aim should be realistic. ‘Halting’ desertification may be an impossible task, but effective measures to ‘combat’ desertification may be more appropriate in this case. The degradation processes should also include ‘human induced accelerated’ degradation processes.

## Amendment 15

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 22

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| 22) In order to successfully prevent and limit risk to human health and the environment stemming from soil contamination, Member States should identify the sites which according to their assessment are posing a significant risk in this regard. Given the number of sites which are likely to be contaminated, their identification requires a systematic step-by-step approach. To monitor progress on the identification of the contaminated sites a timetable is needed. | 22) In order to successfully prevent and limit risk to human health and the environment stemming from soil contamination, Member States should identify the sites which according to their assessment are posing a significant risk in this regard. Given the number of sites which are likely to be <del>contaminated</del> , polluted, to such an extent that they represent a treat to human and or ecosystem health, their identification requires a systematic step-by-step approach. To monitor progress on the identification of the <del>contaminated</del> polluted sites a timetable is needed. |

### Justification

The ISO definition of ‘*contamination*’ as used by the soil community does not infer harm. If harm is to be inferred, then the correct term is ‘*pollution*’. Using the two terms in their context the above changes are proposed.

## Amendment 16

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 23

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| 23) To support the identification of contaminated sites and to secure a common approach, it is necessary to establish a common list of activities which can have a significant potential to cause soil contamination. This common list of potentially soil polluting activities may be complemented by other more comprehensive lists adopted at national level. | 23) To support the identification of contaminated sites and to secure a common approach, it is necessary to establish a common list of activities, which can have a significant potential to cause soil contamination. This common list of potentially soil <del>polluting</del> <b>contaminating</b> activities may be complemented by other more comprehensive lists adopted at national level. |

### Justification

To be in line with the ISO definition of soil “*contamination*” and “*pollution*”, it is more appropriate to make the above replacement, because at this stage the list is for potential soil contaminating activities. It is known yet if the soil contamination is causing harm to humans or the environment.

## Amendment 17

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 24

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| 24) The identification of contaminated sites should be reflected in a national inventory of contaminated sites to be updated regularly and made available for the public to consult. Previous and current efforts by Member States to identify contaminated sites should be taken into account. | 24) The identification of contaminated sites should be reflected in a national inventory of <b>potentially</b> contaminated sites to be updated regularly and made available for the public to consult. Previous and current efforts by Member States to identify contaminated sites should be taken into account. <b>This inventory shall take into account elevated natural geochemical baseline values, since these may locally be threatening ecosystem and human health.</b> |

### Justification

To be in line with other paragraphs the inventory should include all ‘*potentially*’ contaminated sites. In this case the list is based on the list of potentially soil contaminating activities of Paragraph 23.

There seems to be little reference to soils that may be considered to represent a hazard to human or ecological health, because of the presence of substances that may be of geological rather than human made origin. These include radionuclides, heavy metals, persistent organic pollutants (Polycyclic Aromatic Hydrocarbons - PAHs) and minerals (asbestos) that may be present in say mineralised soil, peat, etc. This can be a major issue where soil guideline values and, thence contaminated land regulations are based on harm, irrespective of whether the substance is of geological or human origin.

In such cases, these soils may be considered to have a reduced functionality (i.e. their ability to act as a “filter” may be reduced because they already contain elevated concentrations of a substance) or service potential (biodiversity is restricted by the presence of trace elements).

If soil, high in natural arsenic, is stored during development (for a month) and then put back onto the same site will this be viewed as a contaminative or polluting activity? How will such regulations link to existing EU policy on waste and mine waste?

In the Directory it is important to take into account the natural geochemical baseline variability, because there are many cases where there are abnormal concentrations of chemical elements that locally may be exerting negative pressure to ecosystems and human health.

## Amendment 18

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 25

| Commission text   | Amendments Proposed by EGS  |
|---|---|
| <p>25) In order to assist in the rapid identification of contaminated sites, the owner of a site where, according to official records such as national registers or cadastres, a soil-polluting activity has taken or is taking place, or the prospective buyer should, prior to completing the land transaction, provide relevant information on the status of the soil to the competent authority and to the other party in the transaction. The provision of such information at the time when a land transaction is being planned, will help to speed up the completion of the inventory of contaminated sites. It will also make the prospective buyer aware of the state of the soil and enable him to make an informed choice.</p> | <p>25) In order to assist in the rapid identification of contaminated sites, the owner of a site where, according to official records such as national registers or cadastres, a soil-contaminating <del>polluting</del> activity has taken or is taking place, or the prospective buyer should, prior to completing the land transaction, <del>or the establishment of an activity that differs from the potentially contaminating activity or activities previously carried out, or that supposes a change in land use,</del> provide relevant information on the status of the soil to the competent authority and to the other party in the transaction. The provision of such information at the time when a land transaction <del>or a change in activity or land use</del> is being planned, will help to speed up the completion of the inventory of <del>potentially</del> contaminated sites. It will also make the prospective buyer aware of the state of the soil and enable him to make an informed <del>decision choice</del>.</p> |

### Justification

To be in line with other paragraphs with respect to the appropriate use of the terms ‘contamination’ or ‘pollution’, ‘contaminating’ or ‘polluting’, ‘soil-polluting’ should be replaced by ‘soil-contaminating’, and to qualify the inventory in accordance with other paragraphs as of ‘potentially contaminated sites’.

Further, there is a need to characterise the land for sale, change of activity or land use. Finally, the prospective buyer to make an informed ‘decision’.

## Amendment 19

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 32

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| 32) It is recognised that different risk assessment methodologies for contaminated sites are currently being applied in Member States. In order to move towards a common approach ensuring neutral conditions of competition and a coherent soil protection regime, a thorough exchange of information is needed to establish the suitability of harmonising some of the elements of risk assessment as well as to further develop and improve the methodologies on eco-toxicological risk assessment. | 32) It is recognised that different risk assessment methodologies for contaminated sites are currently being applied in Member States. In order to move towards a common approach ensuring neutral conditions of competition and a coherent soil protection regime, a thorough exchange of information is needed to establish the suitability of harmonising some of the elements of risk assessment as well as to further develop and improve the methodologies on <b>human, ecological and</b> eco-toxicological risk assessment. |

### Justification

Since, this paragraph is concerned with different risk assessment methodologies, it would be appropriate to name them, i.e., *human, ecological* and eco-toxicological risk assessment.

## Amendment 20

“Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil and amending Directive 2004/35/EC”, paragraph 34

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| 34) Provisions should be adopted as regards the data exchange formats and data quality criteria and these would need to be consistent with the establishment of any infrastructure for spatial information in the Community. | 34) Provisions should be adopted as regards the data exchange formats and data quality criteria and these would need to be consistent with the provisions of Directive 2007/xx/EC establishing an <del>establishment of any</del> infrastructure for spatial information in the Community (INSPIRE). |

### Justification

Since, the INSPIRE Directive has been approved, it would be appropriate to include it. It is noted that in the identification of soil contamination, data quality and availability are two key issues. High quality data rarely comes free, and it is essential that this is recognised when developing policy in respect of INSPIRE.



## Amendment 21

Chapter I – “General provisions”,  
Article 1 “Subject-matter and scope”, paragraph 1

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>  |
|--|--|
| <p>1. This Directive establishes a framework for the protection of soil and the preservation of the capacity of soil to perform any of the following environmental, economic, social and cultural functions:</p> <p>(a) biomass production, including in agriculture and forestry;</p> <p>(b) storing, filtering and transforming nutrients, substances and water;</p> <p>(c) biodiversity pool, such as habitats, species and genes;</p> <p>(d) physical and cultural environment for humans and human activities;</p> <p>(e) source of raw materials;</p> <p>(f) acting as carbon pool;</p> <p>(g) archive of geological and archeological heritage.</p> <p>To that end, it lays down measures for the prevention of soil degradation processes, both occurring naturally and caused by a wide range of human activities, which undermine the capacity of a soil to perform those functions. Such measures include the mitigation of the effects of those processes, and the restoration and remediation of degraded soils to a level of functionality consistent at least with the current and approved future use.</p> | <p>1. This Directive establishes a framework for the protection <b>and remediation</b> of soil, <b>the enhancement of degraded soil quality</b> and the preservation <b>and restoration</b> of soil <b>and of its relative capacity</b> to perform any of the following environmental, economic, social and cultural functions, <b>while ensuring a sustainable use of the soil</b>:</p> <p>(a) biomass production, including in agriculture and forestry;</p> <p>(b) storing, filtering, <b>buffering</b> and transforming nutrients, <b>and naturally occurring</b> substances <del>and water</del>;</p> <p><b>(c) infiltration of water and replenishment of groundwater reservoirs;</b></p> <p><b>(d) source of vital sediment and nutrients;</b></p> <p>(e) biodiversity pool, such as habitats, species and genes;</p> <p>(f) physical and cultural environment for humans and human activities;</p> <p>(g) source of raw materials;</p> <p><b>(h) acting as carbon reservoir pool;</b></p> <p>(i) archive of geological, <b>cultural</b> and archaeological heritage.</p> <p>To that end, it lays down measures for:</p> <ul style="list-style-type: none"> <li>• the prevention of soil <b>loss and</b> degradation processes, <del>both occurring naturally and</del> caused by a wide range of human activities, which undermine the <b>preservation</b> of soil <b>and of it’s capacity of a soil</b> to perform those functions; <b>Such measures include</b></li> <li>• the mitigation of the effects of those processes and the restoration and remediation of degraded soils to a level of functionality consistent at least with the current and approved future use.</li> </ul> |

### Justification

1. The proposed amendments point out that the major objectives of this Directive, such as environmental, economic, social and cultural functions, should not be in contrast with a sustainable use of soil. It also means that prevention measures do not include mitigation and

restoration.

Reason for adding 'remediation': Since, this Directive establishes a framework for the protection of soil, it is appropriate to add at the beginning 'remediation' in order to point that it is necessary to remediate the soil, and restore its multi-functionality as far as possible.

(b) Reason for adding 'buffering': buffering is also an important soil function that should be included.

(b) Reason for adding 'naturally occurring': To avoid an interpretation of soil as being a dump of unwanted and harmful substances.

(c) Reason for adding 'infiltration of water and replenishment of groundwater reservoirs': soil has an important function for the infiltration and replenishment of groundwater reservoirs which is not getting any attention in the present formulation of soil functions. Therefore, it is proposed to consider adding it as a separate soil function. In this specific context, the current Soils Directive is strongly complementary to the new Directive 2006/118/EC on the Protection of Groundwater Against Pollution and Deterioration, "Daughter" of WFD 2000/60/EC.

(d) Reason for adding 'source of vital sediment and nutrients': In nature, the production of sediments is a soil function of vital importance for life and for the natural dynamic processes occurring on the terrestrial surface of earth. When soil erosion occurs at very low rates, and does not exceed the rate of soil formation, the quantity of produced sediments generally exerts a positive effect on the environment. Sediments become part of the aquatic ecosystems and form a large variety of habitats from river to marine environments (SedNet, 2004). Any animal and plant species live directly within the sediment; other species have a very strict dependence with suspended sediments in river waters or with sediments deposited in shallow or deep water bodies. Sediments can play a crucial role in combating coastal erosion. Sediments, as mentioned under point (g), can be a source of valuable economic materials (sand, gravel and other materials), and represent a very important resource for agriculture (fertile alluvial deposits or amending material rich in nutrients and organic matter). Further, it is necessary to coordinate the amendments with the text of the new Directive 2006/118/EC on the Protection of Groundwater Against Pollution and Deterioration, "Daughter" of WFD 2000/60/EC.

(h) Reason for replacing 'pool' by 'reservoir': A carbon pool is a reservoir that contains carbon as a principal element in the biogeochemical cycle.

(i) Reason for adding 'cultural': it will be a good idea to add 'cultural', since soil is an archive also of our cultural heritage. 'Cultural heritage', apart from archaeological and geological, is a much wider term, and includes "movable and immovable objects of artistic, architectural, historical, ethnographic, and palaeontological interest.

Reason for removing 'both occurring naturally and': To prevent natural soil degradation is be definition and physically impossible, and in most situations also undesirable as it would be even stop our soils and planet Earth to function naturally (refer also to Amendment 14).

## Amendment 22

Chapter I – “General provisions”,  
Article 1 “Subject-matter and scope”, paragraph 2

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| 2. This Directive shall apply to soil forming the top layer of the earth’s crust situated between the bedrock and the surface, excluding groundwater as defined in Article 2(2) of Directive 2000/60/EC of the European Parliament and of the Council. | 2. This Directive shall apply to soil forming the top layer of the earth’s crust situated between the bedrock and the surface, <b>including bedrock exposures important for the geological heritage function, and soil water,</b> but excluding groundwater as defined in Article 2(2) <b>and Article 2(11)</b> of Directive 2000/60/EC of the European Parliament and of the Council, <b>and to protect groundwater against pollution as defined in Directive 2006/118/EC.</b> |

### Justification

Since, Article 2 is used for definitions, the recommendation is that all definitions to be included in Article 2 and that the definition of soil is consequently deleted from this text.

The text in Paragraph 2 of Article 1 should include ‘bedrock exposures’, since these are important for the geological heritage function.

The text in Paragraph 2 of Article 1 should also include reference to ‘soil water’ and relationships to other Directives. “soil water” (term used and defined by ISO in soil related documentation) has to be included too, as such water forms an intrinsic component of soil that modifies physical, chemical and biological aspects of soils and **their function**.

Note that the definition of groundwater as used in Article 2(2) of Directive 2000/60/EC may not include water in the saturated and unsaturated zone in contact with soil depending on the interpretation and definition of “ground”. The actual Article states “Groundwater” means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

## Amendment 23

### Chapter I – Article 2 “Definitions“

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| <p>For the purposes of this Directive, the following definitions shall apply:</p> <p>(1.) ‘sealing’ means the permanent covering of the soil surface with an impermeable material;</p> <p>(2.) ‘dangerous substances’ means substances or preparations within the meaning of Council Directive 67/548/EC<sup>12</sup> and Directive 1999/45/EC of the European Parliament and of the Council.</p> | <p>For the purposes of this Directive, the following definitions <b>for soil and its main threats</b> shall apply:</p> <p>(1.) ‘<i>Soil</i>’ is the top layer of the earth’s crust, formed by mineral particles of geological origin and soil forming processes, organic matter, water, air and living organisms. It is the interface between the solid Earth, air and water and hosts most of the biosphere. It is the basis for the different functions listed under Article 1.</p> <p>(2.) ‘<i>Soil water</i>’ includes all sub-surface water of the unsaturated (vadose) and saturated (groundwater) zones.</p> <p>(3.) ‘<i>Sealing</i>’ means the permanent covering of the soil surface with an artificial impermeable material, which impedes its normal functions; artificial soil compaction is not part of the soil sealing process.</p> <p>(4.) ‘<i>Soil erosion</i>’ is a physical, normally irreversible phenomenon, resulting from the removal of soil particles by water or wind (including coastal processes); soil erosion rates are increased considerably by human activities;</p> <p>(5.) ‘<i>Landslides</i>’ are shallow or deep, slow or rapid, down slope movements, induced by gravity, involving soil and/or rock and/or debris;</p> <p>(6.) ‘<i>Salinisation</i>’ is the accumulation of soluble salts in soil.</p> <p>(7.) ‘<i>Compaction</i>’ is the compression of soil porosity.</p> <p>(8.) ‘<i>Organic matter decline</i>’ means that the rate of addition is less than the rate of decomposition of organic matter in soil.</p> <p>(9.) ‘<i>Dangerous substances</i>’ means substances or preparations within the meaning of Council Directive 67/548/EC<sup>12</sup> and Directive 1999/45/EC of the European Parliament and of the Council.</p> <p>(10.) ‘<i>Geological heritage</i>’ includes soil,</p> |

|  |   |
|--|---|
|  | <p>geomorphological and geological objects and processes.</p> <p>(11.) ‘<i>Cultural heritage</i>’ includes movable and immovable objects of artistic, architectural, historical, archaeological, ethnographic, and palaeontological importance.</p> |
|--|---|

### Justification

The recommendation is to place all relevant definitions under Article 2. All terms defined above are relevant to this Directive.

(a) Definition of soil has been taken from COM(2006)231.

However, there is another suitable definition for the Directive, taken from the United States Department of Agriculture (USDA), which is extremely accurate and also cited by the International Union of Soil Sciences (IUSS), and on the Soil Taxonomy. The USDA definition is coherent with the European Environment Agency one: ‘*Soil is a three-dimensional body performing a wide range of socio-economic and ecological functions. It is a complex media formed by a porous matrix, in which air, water and biota occur together with the fluxes of substances and fluids between these elements. Alteration of soil processes leads to changes in the functioning of ecosystems, and many environmental problems which become apparent in other media actually originate within the soil.*’ Therefore, it is up to the Commission Officers to select the most appropriate definition for the Directive.

(b) Reason for adding ‘soil water’: Soil water is important for soil structure and the transport of nutrients to growing plants, but it also percolates to groundwater.

(c) Reason for adding ‘geological heritage’: To make it clearer that geological heritage also includes soil heritage and geomorphological heritage, and can other processes having heritage value.

(d) Reason for adding ‘cultural heritage’: It is a more general term and includes many objects that are of value to our heritage that are important for scientific research, education and tourism.

In general, it is proposed to extend the number of definitions, to include also *erosion, organic matter decline, compaction, salinisation, landslides, etc.* This would, at the same time, avoid the need for certain amendments already proposed, with the aim to clarify the meaning of specific terms (e.g. the one proposed in Article 6e). The recommendation is to adopt definitions originally used in COM (2002) 179 “*Towards a Thematic Strategy for Soil Protection*”.

With regard to Chapter III, (esp. Article 9 and Article 10) of the Directive proposal it is also strongly recommended to define terms related to soil contamination.

Referring to the definitions giving in ISO 11074 a **Contaminant** is substance or agent present in the soil as a result of human activity and a **Pollutant** is a substance or agent present in the soil (or groundwater) which due to its properties, amount or concentration causes adverse impacts on soil functions or soil use.

Following these definitions, consequently a **Contaminated site** would be “A location where a substance or agent has been introduced into the soil as a result of human activity”, and a

**Polluted site** would be “A location where, as a result of human or natural activity, an unacceptable risk to human health and ecosystem functioning exists” (see also justification related to Amendment no, 15).

The EGS Soil Working Group is aware, that using these definitions might have consequences not only to Chapter III of the current Directive proposal but also to recent publications/communications in the frame of the soil protection strategy. stating this, the members of the EGS Soil Working Group offer the readiness to contribute in further Directive drafts.

## Amendment 24

### Chapter I – Article 3 “integration“

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| In the development of sectoral policies likely to exacerbate or reduce soil degradation processes, Member States shall identify, describe and assess the impacts of such policies on these processes, in particular in the areas of regional and urban spatial planning, transport, energy, agriculture, rural development, forestry, raw material extraction, trade and industry, product policy, tourism, climate change, environment, nature and landscape. Member States shall make public those findings. | In the development of sectoral policies likely to exacerbate or reduce soil degradation processes, Member States shall identify, describe and assess the impacts of such policies on these processes, in particular in the areas of regional and urban spatial planning, transport, energy, agriculture, rural development, forestry, raw material extraction, trade and industry, product policy, tourism, climate change, environment, nature, landscape <b>and hydraulic planning and water management.</b> Member States shall make public those findings |

#### Justification

As mentioned above, one of the objectives of the Directive is the preservation and restoration of soil and its capacity to perform environmental, economic, social and cultural functions, like infiltration of water and replenishment of groundwater reservoirs. The impact of *hydraulic planning* will affect these functions. Minimising floods (and erosion) is a main objective of these policies. The elaboration of plans for groundwater abstraction is the responsibility of *hydraulic administration*, and it is a key factor for protection of over exploited aquifers or aquifers with ongoing salinisation processes, which is related to the protection of soil. Biodiversity is affected as well, for example in wetlands, as ecological flow in rivers and streams is again the responsibility of the *hydraulic administration*. It is, therefore, appropriate to add water management as well.

## Amendment 25

### Chapter I – Article 5 “Sealing“

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| For the purposes of preserving the soil functions referred to in Article 1(1), Member States shall take appropriate measures to limit sealing or, where sealing is to be carried out, to mitigate its effects in particular by the use of construction techniques and products which will allow as many of those functions as possible to be maintained. | For the purposes of preserving the soil functions referred to in Article 1(1), Member States shall take appropriate measures to limit sealing, <u>and also to promote the reduction of greenfield uses and the rehabilitation of unused or abandoned areas (brownfields)</u> or, where sealing is to be carried out, to mitigate its effects in particular by the use of construction techniques and products which will allow as many of those functions as possible to be maintained. |

#### Justification

The rehabilitation of brownfield areas to limit soil sealing of greenfield areas, is referred to both paragraph 4.1.3 of Com(2006)231 and in Recital 13 of this Directive proposal. It should, therefore, be included in Article 5 as well. The proposed amendment needs to be integrated with specific measures to be discussed later on.



## Amendment 26

Chapter II – “Risk prevention, mitigation and restoration”; section one - identification of risk areas –

Article 6 headline

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>   |
|---|---|
| <i>Article 6<br/>Identification of risk areas of erosion, organic matter decline, compaction, salinisation and landslides</i> | <i>Article 6<br/>Identification of risk areas of erosion, organic matter decline, compaction, salinisation, landslides, <b>loss of biodiversity and loss of geological and cultural heritage.</b></i> |

### Justification

Reason for adding ‘soil biodiversity loss’: As already mentioned above soil biodiversity is an important function that should be preserved. Nevertheless, scientific knowledge in the field still needs to be reinforced. Ad hoc studies should first start in certain pilot areas

Reason for adding ‘loss of geological and cultural heritage’: see justification above (Amendment 23)

## Amendment 27

Chapter II – “Risk prevention, mitigation and restoration”; section one - identification of risk areas;

Article 6 –“ Identification of risk areas of erosion, organic matter decline, compaction, salinisation and landslides”

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>  |
|---|--|
| <p>1. Within five years from [transposition date], Member States shall identify the areas in their national territory, at the appropriate level, where there is decisive evidence, or legitimate grounds for suspicion, that one or more of the following soil degradation processes has occurred or is likely to occur in the near future, hereinafter “the risk areas”:</p> <p>(a.) erosion by water or wind;</p> <p>(b.) organic matter decline brought about by a steady downward trend in the organic fraction of the soil, excluding undecayed plant and animal residues, their partial decomposition products, and the soil biomass;</p> <p>(c.) compaction through an increase in bulk density and a decrease in soil porosity;</p> <p>(d.) salinisation through the accumulation in soil of soluble salts;</p> <p>(e.) landslides brought about by the down-slope, moderately rapid to rapid movement of masses of soil and rock material.</p> <p>For the purposes of that identification, Member States shall, in respect of each of those soil degradation processes, use at least the elements listed in Annex I and shall take into account the effects of those processes in exacerbating greenhouse gas emissions and desertification.</p> | <p>1. Within five years from [transposition date], Member States shall identify the areas in their national territory, at the appropriate level, where there is decisive evidence, or legitimate grounds for suspicion, that one or more of the following soil degradation processes has occurred or is likely to occur in the near future, hereinafter “the risk areas”:</p> <p>(a.) <b>accelerated water or wind erosion induced by human activities;</b></p> <p>(b.) organic matter decline brought about by a steady downward trend in the organic fraction of the soil, excluding undecayed plant and animal residues, their partial decomposition products, and the soil biomass;</p> <p>(c.) compaction through an increase in bulk density and a decrease in soil porosity;</p> <p>(d.) salinisation through the accumulation in soil of soluble salts;</p> <p>(e.) landslides brought about by the down-slope, moderately rapid to rapid movement of masses of soil and rock material;</p> <p>(f.) <b>soil biodiversity loss brought about by an unnatural reduction in variety, abundance and distribution of soil biota;</b></p> <p>(g.) <b>loss of geological and cultural heritage through levelling, digging, sealing and other human activities.</b></p> <p>For the purposes of that identification, Member States shall, in respect of each of those soil degradation processes, use at least the elements listed in Annex I, <b>may refer to the Document Common Criteria for the Risk Area Identification according to Soil Threats of the Joint Research Centre and the European Soil Bureau of the European Commission, taking also into</b></p> |

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|---|---|
| <p>2. The risk areas identified pursuant to paragraph 1 shall be made public and reviewed at least every ten years.</p> | <p>account the areas identified according to Article 5 of the Directive 200x/xx/EC on the assessment and management of flood risk, and shall take into account the effects of those processes in exacerbating greenhouse gas emissions and desertification.</p> <p>2. The risk areas identified pursuant to paragraph 1 shall be made public and reviewed at least every ten years.</p> |
|---|---|

### Justification

(a.) Reason for adding ‘accelerated water or wind erosion induced by human activities’: naturally occurring wind and water erosion is not something we generally want to interfere with, nor will this in most cases be possible. We, therefore, should clarify the human-induced accelerated soil erosion.

(f.) Reason for adding ‘soil biodiversity loss’: The Directive proposal, setting provisions for the identification of risk areas referred to in Article 6, does not take into account the ‘soil biodiversity loss’ as degradation factor, but only considers the physical-chemical processes contributing to such a loss. The ‘soil biodiversity loss’ has to be understood as impoverishment of its biota component, where soil biota plays an essential role in maintaining physical and biochemical properties needed for soil fertility and for a favourable conservation status of natural ecosystems, many of which are of considerable ecological value (e.g., forests, floodplains, peat-bogs, wetlands, rural districts). Decline in soil biodiversity makes also soils more vulnerable to other degradation processes. The ‘soil biodiversity loss’ risk factor, should be, therefore, taken into account in areas with considerable ecological value, and in those affected by a very high human impact, such rural districts.

(g.) Reason for adding ‘loss of geological and cultural heritage’: Part of our European geological and cultural heritage is also under threat of disappearing with negative consequences for biodiversity, future scientific research, education and tourism.

The additions in the last paragraph are considered significant for referring to criteria that have already been identified by the European Soil Bureau, and also Article 5 of Directive 200x/xx/EC on the assessment and management of flood risk.

## Amendment 28

Chapter II – “Risk prevention, mitigation and restoration”; section one - identification of risk areas; Article 8 (headline)

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| <i>Programmes of measures to combat erosion, organic matter decline, compaction, salinisation and landslides</i> | <i>Programmes of measures to combat erosion, organic matter decline, compaction, salinisation, <del>and</del> landslides, <i>loss of biodiversity, and deterioration of geological and cultural heritage.</i></i> |

### Justification

Concerning ‘*loss of biodiversity, and deterioration of geological and cultural heritage*’ see reasons above.

## Amendment 29

Chapter III – “Soil contamination”; section one - prevention and inventory;  
Article 9 - “Prevention of soil contamination”; first paragraph

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>  |
|---|--|
| For the purposes of preserving the soil functions referred to in Article 1(1), Member States shall take appropriate and proportionate measures to limit the intentional or unintentional introduction of dangerous substances on or in the soil, excluding those due to air deposition and those due to a natural phenomenon of exceptional, inevitable and irresistible character, in order to avoid accumulation that would hamper soil functions or give rise to significant risks to human health or the environment. | For the purposes of preserving the soil functions referred to in Article 1(1), Member States shall take appropriate and proportionate measures to limit the intentional or unintentional introduction of dangerous substances on or in the soil, excluding <del>those due to air deposition and</del> those due to a natural phenomenon of exceptional, inevitable and irresistible character, in order to avoid accumulation that would hamper soil functions or give rise to significant risks to human health or the environment. |

### Justification

Reason for erasing ‘~~those due to air deposition and~~’: The objective is to reduce hazardous emissions to the atmosphere, and to prevent the introduction of hazardous substances in soil by air deposition. Therefore, such measures to prevent this happening should be included in the Directive.

### Amendment 30

Chapter III – “Soil contamination”; section one - prevention and inventory;  
Article 10 – “Inventory of contaminated sites”

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| <p>1. Member States shall, in accordance with the procedure laid down in Article 11, identify the sites in their national territory where there is a confirmed presence, caused by man, of dangerous substances of such a level that Member States consider they pose a significant risk to human health or the environment, hereinafter “contaminated sites”. That risk shall be evaluated taking into account current and approved future use of the land.</p> <p>2. Member States shall establish a national inventory of contaminated sites, hereinafter “the inventory”. The inventory shall be made public and reviewed at least every five years.</p> | <p>1. Member States shall, in accordance with the procedure laid down in Article 11, identify the sites in their national territory where there is a confirmed presence, caused by man, of dangerous substances of such a level that Member States consider they pose a significant risk to human health or the environment, hereinafter “contaminated sites”. That risk shall be evaluated taking into account current and approved future use of the land.</p> <p>2. Member States shall establish a national inventory of <b>potentially</b> contaminated sites, hereinafter “the inventory”. The inventory shall be made public and reviewed at least every five years.</p> |

#### Justification

2. *Reason for adding ‘potentially’*: This is to be in line with the terminology already used. The Inventory to begin with will be compiled on the basis of potential contaminating activities, and the levels of contaminants in soil will not be known at this stage.

## Amendment 31

Chapter III – “Soil contamination”; section one - prevention and inventory;  
Article 11 – “Identification procedure”

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| <p>1. Each Member State shall designate a competent authority to be responsible for the identification of contaminated sites.</p> <p>2. Within five years from [transposition date], the competent authorities shall have identified the location of at least the sites where the potentially soil-polluting activities referred to in Annex II are taking place or have taken place in the past. For those purposes, the activities referred to in point 2 of Annex II shall be considered independently of the thresholds specified in Annex I to Council Directive 96/61/EC14, except for the activities carried out by micro-enterprises, as defined in point 3 of Article 2 in the Annex to Commission Recommendation 2003/361/EC, and those relative to the rearing of livestock. The identification shall be reviewed at regular intervals.</p> <p>3. In accordance with the following timetable, the competent authorities shall measure the concentration levels of dangerous substances in the sites identified in accordance with paragraph 2, and where the levels are such that there may be sufficient reasons to believe that they pose a significant risk to human health or the environment, an onsite risk assessment shall be carried out in relation to those sites:</p> <p>(a) within five years from [transposition date], for at least 10% of the sites;</p> <p>(b) within 15 years from [transposition date], for at least 60% of the sites;</p> | <p>1. Each Member State shall designate a competent authority to be responsible for the identification of contaminated sites, <b>and a competent authority for collating and storing the collected data. The latter will be also in charge of forwarding the information to the authorities in charge of developing the master management plans.</b></p> <p>2. Within five years from [transposition date], the competent authorities shall have identified the location <b>of at least the sites where the potentially soil-polluting activities referred to in Annex II are taking place or have taken place in the past.</b> <b>potentially contaminated sites and established the national inventory in accordance with the criteria described in Article 10.</b> For those purposes, the activities referred to in point 2 of Annex II shall be considered independently of the thresholds specified in Annex I to Council Directive 96/61/EC14, except for the activities carried out by micro-enterprises, as defined in point 3 of Article 2 in the Annex to Commission Recommendation 2003/361/EC, and those relative to the rearing of livestock. The identification shall be reviewed at regular intervals.</p> <p><del>3. In accordance with the following timetable, the competent authorities shall measure the concentration levels of dangerous substances in the sites identified in accordance with paragraph 2, and where the levels are such that there may be sufficient reasons to believe that they pose a significant risk to human health or the environment, an onsite risk assessment shall be carried out in relation to those sites:</del></p> <p><b>3. In accordance with the following timetable, Member States shall ensure that preliminary investigations are carried out at the sites identified as potentially hazardous in accordance with paragraph 2 of this</b></p> |

|  |   |
|--|---|
| <p>(c) within 25 years from [transposition date], for the remaining sites.</p> | <p><b>Article.</b> In case such investigations reveal the possibility of a significant risk to human health, or the environment, detailed site investigations shall be carried out, including an evaluation of site-specific human and environmental risk, depending on the end land use. Member States shall establish the criteria to be applied, only to specific cases, for the identification of significant risks at the contaminated sites, making exclusive use of the results of the preliminary investigations:</p> <ul style="list-style-type: none"> <li>(a) within five years from [transposition date], for at least 10% of the sites;</li> <li>(b) within 15 years from [transposition date], for at least 60% of the sites;</li> <li>(c) within 25 years from [transposition date], for the remaining sites.</li> </ul> |
|--|---|

#### Justification

In order to establish if a potentially contaminated site is actually contaminated for current or other approved land use, it is necessary to carry out both a preliminary and a detailed site investigation, which apart from measuring the concentration levels of dangerous substances, a site specific risk assessment, depending on the end land-use, should be performed, where several other human health and environmental characteristics are considered. Therefore, measurement of concentration levels cannot be the only determining factor of the above described identification process.

Moreover, in order to ensure a certain flexibility, it is necessary to foresee that Member States can adopt simplified criteria for the identification of potentially contaminated sites, in particular in the case of small sites, without necessarily making use of detailed site investigations and risk analysis.



## Amendment 32

Chapter III – “Soil contamination”; section one - prevention and inventory;  
Article 12 – “Soil status report”

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>  |
|---|--|
| <p>1. Where a site is to be sold on which a potentially polluting activity listed in Annex II is taking place, or for which the official records, such as national registers, show that it has taken place, Member States shall ensure that the owner of that site or the prospective buyer makes a soil status report available to the competent authority referred to in Article 11 and to the other party in the transaction.</p> <p>2. The soil status report shall be issued by an authorised body or person appointed by the Member State. It shall include at least the following details:</p> <ul style="list-style-type: none"> <li>(a) the background history of the site, as available from official records;</li> <li>(b) a chemical analysis determining the concentration levels of the dangerous substances in the soil, limited to those substances that are linked to the potentially polluting activity on the site;</li> <li>(c) the concentration levels at which there are sufficient reasons to believe that the dangerous substances concerned pose a significant risk to human health or to the environment.</li> </ul> | <p>1. Where a site is to be sold on which a potentially polluting activity listed in Annex II is taking place, or for which the official records, such as national registers, show that it has taken place, Member States shall ensure that the owner of that site or the prospective buyer makes a soil status report available to the competent <del>authority</del> <b>authorities</b> referred to in Article 11 and to the other party in the transaction.</p> <p>2. The soil status report shall be issued by an authorised body <b>of proven professional status</b> <del>or person</del> appointed by the Member State. It shall include at least the following details:</p> <ul style="list-style-type: none"> <li>(a) the background history of the site, as available from official records;</li> <li>(b) <del>a</del> <b>chemical analyses analysis of representative soil samples, covering adequately the investigated area, shall be performed for the purpose of</b> determining the concentration levels of the dangerous substances in soil <b>and groundwater (in accordance with the measures that each Member States will adopt at national level to comply with the Groundwater Directive); the chemical analyses shall be</b> limited to those substances that are linked to the potentially <del>polluting</del> <b>contaminating</b> activity on the site;</li> <li>(c) the concentration levels at which there are sufficient reasons to believe that the dangerous substances concerned <b>could</b> pose a significant risk to human health or to the environment. <b>According to the Groundwater Directive, maximum concentration levels at which thresholds values, established by Member States, in groundwater are exceeded, must be measured;</b></li> <li>(d) if wastes or by-products have been produced, a copy of the annual declaration report submitted by the producer shall be attached to the soil status report;</li> <li>(e) the site investigation report shall, where relevant, <b>include the state of organic matter,</b></li> </ul> |

|   |   |
|---|---|
| <p>3. Member States shall establish the methodology necessary for determining the concentration levels referred to in paragraph 2(b).</p> <p>4. The information contained in the soil status report shall be used by the competent authorities for the purposes of identifying contaminated sites in accordance with Article 10(1).</p> | <p>compaction, salinisation, biodiversity loss, archaeological and geological heritage.</p> <p>3. Member States shall establish <del>the methodology necessary for determining the concentration levels referred to in</del> criteria and procedures, as well as analytical and statistical methods, to undertake investigations and risk analysis as referred to in paragraph 2(b), <del>in accordance with the procedure laid down in Article 11.</del></p> <p>4. The information contained in the soil status report shall be used by the competent authorities for the purposes of identifying contaminated sites in accordance with Article 10(1).</p> |
|---|---|

### Justification

1. Reason for proposing ‘authorities’ instead of ‘authority’: In most countries there are the local and central State authorities.

2. Reason for proposing the qualifying statement ‘of proven professional status’ and erasing ‘or person’: The authorised body must be of ‘proven professional status’ in order to ensure that a well organised professional investigation will be carried out. In contaminated land investigations one cannot rely on the expertise of a single ‘person’.

2(b). Reason for proposing the amendments in this paragraph: ‘a chemical analysis’ cannot determine the levels of contaminants of a site. Representative soil samples, should be collected across the whole property and chemical analyses performed on these samples. Since, the contamination may have reached groundwater, representative groundwater samples should also be collected and analysed.

2(c). Reason for proposing the addition of ‘could’ and ‘groundwater directive’: the addition of ‘could’ pose a significant risk is considered relevant, since this is an unknown factor that must be verified by the risk assessment. The Groundwater directive should be mentioned here, since the contamination in soil may have reached groundwater.

2(d). Reason for proposing ‘if wastes or by-products have been produced, a copy of the annual declaration report submitted by the producer shall be attached to the soil status report’: if wastes or by-products have been produced, it is important to know the quantities produced, and their chemical composition.

2(e). Reason for proposing ‘the site investigation report shall, where relevant, include the state of organic matter, compaction, salinisation, biodiversity loss, archaeological and geological heritage’: it is important to include in the soil status report a qualitative and indicative description of organic matter, compaction (structure), and salinisation, where relevant, which may help to improve the soil status, for example, the infiltration capacity for water, even in town and city areas. Biodiversity loss, archaeological and geological heritage should also be mentioned in the investigation report.

3. Reason for suggesting the amendments: The suggested amendments specify concisely the work that the Member States shall do. Although this item is left to each Member State, it will be advantageous if a ‘Manual of Contaminated Site Investigation’ is prepared by the

Commission, where the minimum requirements are identified, and recommendations made with respect to representative soil sampling, method of sample preparation, chemical analytical method(s) to be used, conditions of quality control in the field and laboratory, estimation of measurement errors, estimation of measurement uncertainty, and methods of data processing and presentation. Some European Union countries have already such investigation manuals.

### Amendment 33

Chapter III – “Soil contamination”; section two – “remediation”; Article 13 – “Remediation”

| Commission text  | Amendments Proposed by EGS  |
|--|---|
| <p>1. Member States shall ensure that the contaminated sites listed in their inventories are remediated.</p> <p>2. Remediation shall consist of actions on the soil aimed at the removal, control, containment or reduction of contaminants so that the contaminated site, taking account of its current use and approved future use, no longer poses any significant risk to human health or the environment.</p> | <p>1. Member States shall ensure that the contaminated sites listed in their inventories are <b>permanently</b> remediated. <b>Where there are serious threats of contaminant dispersion, endangering both humans and the environment, urgent temporary safety measures shall be adopted.</b></p> <p>2. Remediation shall consist of actions on the soil <b>and water</b> aimed at the removal, control, containment or reduction of contaminants so that the contaminated site, taking account of its current use and approved future use, no longer poses any significant risk to human health or the environment.</p> <p>3. <b>Member States shall identify measures by which to encourage soil remediation technologies allowing the preservation or recovery of soil functions and its reuse. The scope and performance of remediation actions shall be such as to guarantee that any remaining contamination translates into acceptable risk levels in relation to current land use and anticipated future uses. Remediation of contaminated sites shall be carried out by applying the best available techniques in accordance with the specific characteristics of each case. Remediation actions shall ensure that permanent solutions are achieved, and, to the greatest extent possible, shall give priority to <i>in situ</i> treatment techniques that avoid the generation, transfer and elimination of wastes. Whenever possible, remediation shall be aimed to eliminate contamination sources and to reduce the concentration of contaminants in soil. When there are justified technical, economic or environmental reasons why for not applying a particular type of remediation, solutions aimed at reducing exposure may be recommended,</b></p> |

|  |  |
|--|--|
| <p>3. Member States shall set up appropriate mechanisms to fund the remediation of the contaminated sites for which, subject to the polluter pays principle, the person responsible for the pollution cannot be identified or cannot be held liable under Community or national legislation or may not be made to bear the costs of remediation.</p> | <p><b>provided that they include measures for containing or enclosing affected sites.</b></p> <p>4. Member States shall set up appropriate mechanisms to fund the remediation of the contaminated sites for which, subject to the polluter pays principle, the person responsible for the pollution cannot be identified or cannot be held liable under Community or national legislation or may not be made to bear the costs of remediation.</p> |
|--|--|

### Justification

1. *Reason for suggesting the amendments in this paragraph:* Besides solutions for permanent site remediation, in accordance to existing approved master management plans, it is necessary to foresee also temporary safety measures, which can limit contaminant dispersion in the environment, before application of permanent or final remediation measures.
2. *Reason for suggesting the addition of 'water':* if soil is seriously contaminated, and there is a near surface groundwater body, this should also be remediated.
3. *Reason for proposing the addition of this paragraph:* This is an important paragraph with respect to soil remediation techniques for its sets out the main principles to be followed.

## Amendment 34

Chapter III – “Soil contamination”; section two – “remediation”;  
Article 14– “National Remediation Strategy”

| Commission text   | Amendments Proposed by EGS   |
|---|--|
| <p>1. Member States shall, on the basis of the inventory and within seven years from [transposition date], draw up a National Remediation Strategy, including at least remediation targets, a prioritisation, starting with those sites which pose a significant risk to human health, a timetable for implementation, and the funds allocated by the authorities responsible for budgetary decisions in the Member States in accordance with their national procedures.<br/>Where containment or natural recovery are applied, the evolution of the risk to human health or the environment shall be monitored.</p> <p>2. The National Remediation Strategy shall be in application and be made public no later than eight years after [transposition date]. It shall be reviewed at least every five years.</p> | <p>1. Member States shall, on the basis of the inventory of both potentially contaminated and polluted sites, and within seven years from [transposition date], draw up a National Assessment and Remediation Strategy, including at least minimum remediation targets; to achieve objectives concerning assessed and remediated sites; a prioritisation for assessment and remediation starting with those sites which pose a significant risk to human health; a timetable for implementation; and the funds allocated by the authorities responsible for budgetary decisions in the Member States in accordance with their national procedures. Where containment or natural attenuation <del>recovery</del> are applied, the evolution of the risk to human health or the environment shall be monitored.</p> <p>2. The National Remediation Strategy shall be in application and be made public no later than eight years after [transposition date]. It shall be reviewed at least every five years.</p> |

### Justification

The first inventory is for potentially contaminated sites, based on the chemical characteristics of the different contaminating activities. Following the site investigation and risk assessment according to end land use, the site, if it poses risk to human health or the environment, is placed in an Inventory of Polluted Sites and prioritised. It is recommended to replace ‘natural recovery’ to ‘*natural attenuation*’, since ‘*attenuation*’ is more relevant in this case.

### Amendment 35

Chapter IV – “Awareness raising, reporting and exchange of information”;  
Article 15 – “Awareness raising and public participation”; first paragraph

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| 1. Member States shall take appropriate measures to raise awareness about the importance of soil for human and ecosystem survival, and promote the transfer of knowledge and experience for a sustainable use of soil. | 1. Member States shall take appropriate measures to raise awareness about the importance of soil for human and ecosystem survival, and promote the transfer of knowledge and experience for a sustainable use of soil <b>and soil remediation techniques.</b> |

#### Justification

Besides promoting the transfer of knowledge and experience for a sustainable use of soil, it is appropriate to promote the transfer of knowledge about soil remediation techniques.

## Amendment 36

Chapter IV – “Awareness raising, reporting and exchange of information”;  
Article 16 – “Reporting”; second paragraph

| <b>Commission text</b>  | <b>Amendments Proposed by EGS</b>  |
|---|--|
| 2. The information referred to in paragraph 1(b) shall be accompanied by metadata and shall be made available as documented digital georeferenced data in a format that can be read by a geographic information system (GIS). | 2. The information referred to in paragraph 1(b) shall be accompanied by metadata and shall be made available as documented digital georeferenced data in a format that can be read by a geographic information system (GIS), <b>in accordance with the provisions of Directive 2007/xx/EC establishing an infrastructure for spatial information in the Community (INSPIRE).</b><br><br>3. The information referred to in paragraph 1 (e) and (f) shall be compiled and made available according to guidelines to be defined during the implementation phase through the coordination of the European Commission. |

### Justification

Most Member States already have criteria for the compilation of contaminated sites inventories. These criteria, together with the ones for remediation, differ very much among them or are often available only at regional or local scale. Therefore, guidelines to define common criteria for compiling the required data are necessary, and the INSPIRE Directive should be used.

Without clear and harmonised guidelines, the needed compilation of information would be useless. The EC should take the responsibility of preparing such guidelines and of coordinating the implementation phase.



### Amendment 37

Chapter IV – “Awareness raising, reporting and exchange of information”;  
Article 17 – “Exchange of information”;

| <b>Commission text</b>   | <b>Amendments Proposed by EGS</b>   |
|--|---|
| Within one year from [entry into force], the Commission shall set up a platform for the exchange of information between Member States and stakeholders on the risk area identification pursuant to Article 6 and on risk assessment methodologies for contaminated sites currently in use or under development | Within one year from [entry into force], the Commission shall set up a platform for the exchange of information between Member States and stakeholders on the risk area identification pursuant to Article 6 and on risk assessment methodologies for contaminated sites currently in use or under development, <b>in accordance with the provisions of Directive 2007/xx/EC establishing an infrastructure for spatial information in the Community (INSPIRE).</b> |

#### Justification

The platform for the exchange of information between Member States should be the European Spatial Information infrastructure that will result from the implementation of the INSPIRE Directive.

**Amendment 38**  
ANNEX 1- Sections 1 to 4

*General remark*

The phrasing “soil typological unit” needs clarification. It reminds of the EU Soil geographical database and may mean a predefinition on the related scale (1:1000000). This would be a contradiction to the subsidiary principle!

## ANNEX 1

| <b>SECTION 1</b>   |
|--|
| <b>COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF EROSION</b>  |
| Soil typological unit (STU) (soil type)  |
| Soil texture (STU level)   |
| Soil parent material   |
| Soil density, hydraulic properties (STU level)   |
| Topography, including slope gradient and slope length  |
| Land cover   |
| Land use (including land management and changes in land use, farming systems and forestry, other anthropogenic factors like hydraulic works, etc.) |
| Climate (including rainfall distribution and wind characteristics)   |
| Hydrological and hydrogeological conditions  |
| Agro-ecological zone   |

### Justification

Parent material type should be included. Deposits such as loess that has been deposited in an Aeolian environment will also be subject to wind erosion. The same is true of alluvial deposits. In such cases, the propensity for erosion is inherited from the soil parent material type/composition.

To identify areas at risk of erosion from water and wind, human made works should be included among the elements, since they can play a significant role both in starting or increasing of erosion phenomena and in their control. To better explain, the runoff on a slope of rain water collected from sealed surfaces (road not provided with suitable drainage systems) can give rise to quickened strong erosion processes. The carrying out of appropriate hydraulic works and forestry provide for water regulation, ensuring effective erosion phenomena protection.

Hydrogeology, as a crucial element influencing surface waters, which are directly responsible for erosion, has to be included on the list of criteria.

## SECTION 2

### COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF SOIL ORGANIC MATTER DECLINE

**Soil typological unit (STU) (soil type)**

**Soil texture/clay content**

**Soil organic carbon (total and humus concentration)**

**Soil organic carbon (stock)**

**Climate (including rainfall distribution and wind characteristics)**

**Topography**

**Land cover**

**Land use (including land management and changes in land use, farming systems and forestry, other land use like exploitation including mining)**

#### Justification

Mining activities result in soil denudation. Restoration activities shall be carried out at the end of mining activities and therefore be taken into account as an element.

This element is furthermore significantly important when exploitation activities are illegal.

| <b>SECTION 3</b>   |
|--|
| <b>COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF<br/>COMPACTION</b> |
| <b>Soil typological unit (STU) (soil type)</b>                                   |
| <b>Topsoil and subsoil texture (STU level)</b>                                   |
| <b>Topsoil and subsoil bulk density (STU level)</b>                              |
| <b>Parent material</b>   |
| <b>Bedrock</b>   |
| <b>Soil organic matter (STU level)</b>   |
| <b>Climate</b>   |
| <b>Land cover</b>  |
| <b>Land use (including land management, farming systems and forestry)</b>        |
| <b>Topography</b>  |

Justification

Parent material type and bedrock type should be included here as the propensity of an area to be at risk of compaction is a function of the whole soil profile and its supporting geology, for example soils developed over peat deposits or shrink-swell clays.

| <b>SECTION 4</b>  |
|---|
| <b>COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF SALINISATION</b>                    |
| <b>Soil typological unit (STU) (soil type)</b>  |
| <b>Soil texture (STU level)</b>   |
| <b>Geochemical and hydrochemical properties</b>   |
| <b>Soil hydraulic properties</b>  |
| <b>Irrigation areas, chemical properties of irrigated water and type of irrigation techniques</b> |
| <b>Groundwater information</b>  |
| <b>Climate</b>  |

Justification

The geochemistry and hydrochemistry of the whole soil profile, and the soils underlying geological material, represent important common elements when identifying areas at risk of salinisation.

| SECTION 5  |
|--|
| COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF LANDSLIDES  |
| Soil typological unit (STU) (soil type)  |
| Occurrence/density of existing landslides  |
| <del>Bedrock</del> <b>Geology</b>  |
| <b>Topography and morphology</b>   |
| Land cover   |
| Land use (including <b>changes in land use</b> , land management, farming systems and forestry, other <b>anthropogenic factors like roads, terracing, etc.</b> ) |
| <b>Climate and Climate change (e.g. changes in <i>permafrost</i> thickness and distribution determining instability processes of soil in periglacial zones)</b>  |
| Seismic risk   |
| <b>Soil and sub-soil geotechnical properties</b>   |
| <b>Hydrogeological conditions</b>  |

#### Justification

Geology is preferable to bedrock, as not only the nature of bedrock is important, but also its structure (dip of formations, folding, schistosity, fabric of rocks). All these features are conveniently ground under “geology”.

Morphology contributes to the slope stability.

Geotechnical properties contribute to the slope stability.

Hydrogeological conditions contribute to the slope stability.

Climate change: Change in rainfall regimen (quantity and intensity) significantly contributes to modify soil stress, when affected by erosion and landslides phenomena.

Temperature increase causes melting of *permafrost* ice content, determining instability processes of soil in periglacial zones.

Anthropogenic factors: human made works can modify slope stability, e.g. by causing changes in soil water content, modifying slope geomorphology, carrying out structural measures, etc.

## SECTION 6

### COMMON ELEMENTS FOR THE IDENTIFICATION OF AREAS AT RISK OF BIODIVERSITY LOSS

|  |
|--|
| Soil typological unit (STU)  |
| Common Soil parameters (pH, texture, CEC, ...)                     |
| Topography, including slope gradient and slope length              |
| Land cover   |
| Land use (including land management, farming systems and forestry) |
| Change in land use   |
| Climate (including rainfall distribution and wind characteristics) |
| Pedoclimate  |
| Hydrological conditions  |
| Hydrogeological conditions   |
| Agro-ecological zone   |
| Anthropogenic factors*   |
| Ecotones   |
| Soil organic carbon (total and humus concentration)                |
| Soil organic carbon (stock)  |
| Protected Areas (CIS, SPZs)  |
| Endemic taxa   |
| Abundance of selected taxa of soil biota                           |
| Richness of selected soil biological communities                   |
| Evenness of selected guilds of soil biota                          |
| Edaphic adaptation of selected guilds of soil biota                |
| ...  |

#### Justification

The above indicators are those more frequently used in soil science analyses to assess the conditions influencing soil biota. The Soil Typological Unit itself provides basic information on within-soil processes soil biota suffers from; such processes also represent peculiar habitat conditions for living organisms, affecting their composition and abundance.

\* All human activities that can effect a total loss of soil, or of its ecological properties, should be considered in this analysis. This is why we suggest to consider all the indicators affecting the previous sections.