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Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on (...)

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSAL

• Reasons for and objectives of the proposal

Soil is a vital, limited, non-renewable and irreplaceable resource. Healthy soils are essential for the economy, the society and the environment, and increase the EU's resilience to climate change, extreme weather events, drought and floods. They store carbon, have more capacity to absorb, store and filter water and provide vital services such as safe and sufficient food and biomass.

Scientific evidence[1] indicates that about 60 to 70% of soils in the EU are currently unhealthy. All Member States are facing soil degradation. Degradation processes are continuing and worsening. Drivers and impacts of the problem exceed country borders and reduce the provision of these vital services throughout the EU and its neighbours. This creates risks for human health, the environment, climate, economy and society, including risks for food security, water quality, increased impacts from flooding and droughts, biomass production, carbon emissions and loss of biodiversity.

Existing EU policies have made positive contributions to the improvement of soil health but they do not address all the drivers of soil degradation and therefore significant gaps remain. Soils form at a very slow rate, but their health can be maintained or improved if adequate measures are taken and implemented.

The European Green Deal[2] sets out an ambitious roadmap to transform the Union into a fair and prosperous society, with a modern, resource-efficient and competitive economy, aiming to protect, conserve and enhance the Union's natural capital, and to protect the health and well-being of citizens from environment-related risks and impacts. As part of the European Green Deal, the Commission adopted an EU Biodiversity Strategy for 2030[3], a Zero Pollution Action Plan[4], an EU climate adaptation strategy[5] and an EU Soil Strategy for 2030[6].

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1 European Commission, Directorate-General for Research and Innovation, Veerman, C., Pinto Correia, T., Bastioli, C., et al., Caring for soil is caring for life : ensure 75% of soils are healthy by 2030 for food, people, nature and climate : report of the Mission board for Soil health and food, Publications Office, 2020, https://data.europa.eu/doi/10.2777/821504.

2 Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal COM(2019) 640 final.

3 Communication from the Commission to the European Parliament, the Council the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030, Bringing nature back into our lives COM(2020) 380 final.

4 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' COM(2021) 400 final.

5 Communication from the Commission to the European Parliament, the Council, the European, Economic and Social Committee and the Committee of the Regions, Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM(2021)82 final.

6 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate COM(2021) 699 final.

The EU Biodiversity Strategy for 2030 stated that it is essential to step up efforts to protect soil fertility, reduce soil erosion and increase soil organic matter by adopting sustainable soil management practices and that significant progress is also needed on identifying contaminated soil sites, restoring degraded soils, defining the conditions for their good ecological status, introducing restoration objectives, and improving the monitoring of soil health. The Biodiversity Strategy also announced the update of the 2006 Soil Thematic Strategy (STS) to address soil degradation and fulfil EU and international commitments on land-degradation neutrality.

The EU Soil Strategy for 2030 set the long-term vision to have all soils in healthy condition by 2050, to make protection, sustainable use and restoration of soils the norm and proposes a combination of voluntary and legislative actions. The Strategy announced that the Commission would propose a Soil Health Law (SHL) supported by an impact assessment which should analyse several topics such as indicators and values for soil health, provisions for monitoring soils and requirements for a sustainable use of soils.

The 8th Environment Action Programme[7] set as a priority objective that by 2050 at the latest, people live well, within the planetary boundaries in a well-being economy where nothing is wasted, growth is regenerative, climate neutrality in the Union has been achieved and inequalities have been significantly reduced. Addressing soil degradation and ensuring the protection and sustainable use of soil, including by a dedicated legislative proposal on soil health has been identified as one of the enabling conditions to meet that objective.

The European Parliament[8] called on the Commission to develop an EU legal framework for soil including definitions and criteria for good soil status and sustainable use, objectives, harmonised indicators, a methodology for monitoring and reporting, targets, measures, and financial resources.

The Council of the EU[9] supported the Commission in stepping up efforts to better protect soils and reaffirmed its commitment to land degradation neutrality.

Furthermore, the European Committee of the Regions[10], the European and Economic Social Committee[11] and the European Court of Auditors[12] all called on the Commission to develop a legal framework for the sustainable use of soil.

The unprovoked and unjustified Russian war of aggression against Ukraine has destabilised global food systems, intensified food insecurity risks and vulnerabilities across the world, and amplified the EU's need to be able to bring its food systems into sustainable state for

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7 Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030 (OJ L 114, 12.4.2022, p.22).

8 Resolutions of 28 April 2021 on soil protection (2021/2548(RSP)) and of 9 June 2021 on the EU Biodiversity Strategy for 2030: Bringing nature back into our lives (2020/2273(INI)).

9 Council Conclusions on Biodiversity - the need for urgent action, 12210/20.

10 Opinions NAT-VII/010 of the CoR in the plenary session of 3, 4 and 5 February 2021 on Agro-ecology and Opinion ENVE-VII/019 of the CoR in the plenary session of 26-27 January 2022 on the EU Action Plan: 'Towards zero pollution for air, water and soil'.

11 Opinion NAT/838 of the EESC on the new EU Soil Strategy of 23 March 2022.

12 European Court of Auditors (2018), Combating desertification in the EU: a growing threat in need of more action included as a target in the new Kunming-Montreal Global Biodiversity Framework.

centuries to come. Fertile soils are of geo-strategic importance to secure our access to sufficient, nutritious and affordable food in the long-term. The food supply chain is internationally highly interconnected and dependant. To produce sufficient food for a global population that is expected to grow to 9-10 billion people in 2050, fertile soils are key. The EU is an important global player on international food markets and since 95% of our food is directly or indirectly produced on this precious finite natural resource, soil degradation has a direct impact on food security and the cross-border food markets.

However, the pressure on soil and land is increasing globally: more than 50 years ago, the arable land per person was 0,36 ha while this has been halved to 0,18 ha in 2020. Besides this decrease of available arable land per person, the remaining area is degrading and this affects the long-term fertility potential of soils. It is estimated that between 61% and 73% of agricultural soils are affected by erosion, loss of organic carbon, nutrient (nitrogen) exceedances, compaction or secondary salinisation (or a combination of these threats). Soil compaction for instance may lower crop yields by 2.5-15 %. Without sustainable management and regeneration of soils, deterioration of soil health will lie at the heart of future food security crises.

Healthy soils are instrumental to increase the Union's resilience to adverse events and adaptation to climate change. Europe's resilience to climate change depends on the level of soil organic matter and fertility, water retention and filtering capacity, and resistance to erosion. Carbon farming practices could help to store up to 260 MtCO2 in soils per year and contribute to mitigate climate change. The capacity of soils to retain water contributes to disaster risk prevention and response: by letting more rainfall sink into the ground it reduces the intensity of floodings as well as alleviates the negative effects of drought periods. Some soil bacteria, part of the biodiversity of healthy soils, can also provide drought tolerance to crop plants.

Wildfire risk is increasing across Europe, and fire conditions are set to increase with climate change, notably heat and humidity of ecosystems, including soils. Healthy soils with functional water retention capacities also support healthy forest ecosystems that are more resilient to wildfires. At the same time wildfires can cause soil degradation, leading to increased risks of soil erosion, landslides and floods. Strengthening the knowledge base on soils can contribute to improving disaster risk assessments, that recognise the multi-facetted roles that soils play in mitigating disasters and being degraded because of them. Measures to strengthen soil health build resilience for future stresses, brought on by climate change. Healthy soils are essential for farmers. Maintaining or increasing soil fertility over the long-term contributes to stable or even increased yields of food, feed and biomass and gives farmers long-term production security and business prospect. Measures aimed at this can reduce operational costs on farm level, such as for inputs or machinery, and farmers can receive financial support for certain practices e.g. under the Common Agricultural Policy or the proposal for a Carbon Removal Regulation. Diversification of agricultural and forestry production systems, accompanied by a greater variety of marketable products, also provide opportunities for new jobs and in the EU. Healthy soils will also increase and preserve the value of the land.

Soil degradations harm human health: airborne particulate matter caused by wind erosion cause or worsen respiratory and cardiovascular diseases. Soil sealing prolongs the duration of high temperatures during heat waves and reduces the capacity of soils to act as a sink for

pollutants. Contamination of soils can affect food safety. Approximately 21% of agricultural soils in the EU contain cadmium concentrations in the topsoil that exceed the limit for groundwater. Not least, recreational value, along with physical and mental health, is positively influenced by healthy and sustainably managed soils both in the countryside, but especially also in urban areas where the implementation of sustainable management practices can contribute to the creation of healthy green spaces and reduce heat islands, contribute to better air quality and housing conditions.

Overall, sustainable soil management improves the safety, health, and infrastructure of communities and sustains the livelihood in the surrounding areas, e.g. agro-tourism, markets, infrastructure, culture and well-being. The transition towards healthy soils would improve social perception and the image of the farming and industrial sector.

The importance of soil health has also been recognised globally and the EU has made commitments in the international context of the three Rio Conventions since soils are affected by desertification (UN Convention to Combat Desertification), contribute to climate change mitigation (UN Framework Convention on Climate Change) and constitute an important habitat for biodiversity (Convention on Biological Diversity). Restoring, maintaining and enhancing soil health is included as a target in the new Kunming-Montreal Global Biodiversity Framework.

Soil health also directly contributes to the achievement of several of the Sustainable Development Goals[13] (SDGs) in particular SDG 15.3 which aims to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030.

For these reasons, this proposal puts in place a soil monitoring system and defines what a healthy soil is, setting the stage for sustainable management of soils, to maintain or enhance their health, and thus to achieve healthy and resilient soils everywhere across the EU by 2050. The proposal will help Member States to ensure that soils will be able to deliver the multiple ecosystems services that are vital for both human health and the environment. A gradual approach is proposed, whereby sufficient time is given to Member States to set up their governance system, put in place the soil monitoring, assess soil health and start applying sustainable soil management principles.

Current studies focused on specific practices at farm/land unit level conclude that the costs of implementing sustainable soil management are in many cases outweighed by the economic and in all cases by the environmental benefits. This proposal creates the frame necessary to support soil managers until sustainable soil management and healthy soils deliver their benefits. It will allow the earmarking of national and EU funds for sustainable soil management, and also encourage and support private funding by financial institutions, investors and related industry. The competitiveness of the activities related to soil management will thus be consolidated.

The proposal puts in place a solid and coherent soil monitoring framework for all soils across the EU which is crucial to provide the necessary data and information to define the appropriate measures. This would also lead to technological development and innovation and

[13] https://sdgs.un.org/goals

stimulate academic and industrial research, for example the use of artificial intelligence solutions from sensing systems and field-based measuring systems. The demand of services to carry out the analysis of soil will also develop and consolidate businesses and position of specialised SMEs in the EU. It will also support the development of remote sensing for soil and allow the Commission to pull resources, relying on the existing mechanisms and technology (LUCAS, Copernicus) to offer cost-efficient services to the interested Member States. It is expected that this technological progress will provide farmers and foresters with easier access to their soil data, but it could also lead to a wider range, better availability and financially more accessible technical support for sustainable soil management, including for decision support tools. Soil health data with sufficient granularity could be used by Member States and the EU for enhanced monitoring and trend analysis of drought and disaster management and resilience[14], also in relation to food security, climate change, and pressures on human health and biodiversity.

The proposal tackles soil contamination and requests that Member States address unacceptable risks for human health and the environment that are caused by soil contamination, thus making a contribution to a toxic free environment by 2050. The proposed risk-based approach will allow for standards to be set at national level and thus adapt the decontamination decisions to the site-specific conditions. The proposal will also lead to a better application of the polluter pays principle and more societal fairness for disadvantaged households living closer to contaminated sites. Requirements to identify, investigate, assess and remediate contaminated sites will generate jobs and long-term employment (e.g. environmental consultants, geologists, remediation engineers, etc.).

- **Consistency with existing policy provisions in the policy area**

In the past 30 years, the EU has adopted a substantial and diverse range of environmental measures aimed at improving the quality of the environment for European citizens and providing them with a high quality of life. Several provisions of the existing legislation are of relevance for soil but there is a clear and indisputable gap within the current EU legal framework that the proposal on soil health will fill. The proposal complements existing environmental legislation by providing a coherent and effective legislative EU framework for soils and will also help contributing to the objectives of existing environmental legislation.

Regarding soil contamination, the proposal complements the Industrial Emissions Directive, Waste Framework and Landfill Directives as well as the Environmental Liability Directive and the Environmental Crime Directive by addressing all types of contamination and historical soil contamination. It will make a major contribution to the protection of human health which is one key objective of the EU environmental policy.

Healthy soils have a higher capacity to absorb, store and filter water. The proposal is therefore expected to contribute to the objectives of the Water Framework Directive, the Groundwater Directive, the Nitrates Directive, and the Environmental Quality Standards Directive by addressing inter alia soil contamination, soil erosion and improving soil water retention. In

[14] The European Drought Observatory (see https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1000) information is also based on LUCAS Soil data

addition, healthy soils will also contribute to achieve the objective of preventing floods under the Floods Directive.

The sustainable soil management provisions complement the existing legislation relating to nature (Habitats and Birds Directives) by improving biodiversity (for example for wild pollinators which nest in soils), or air by preventing erosion of soil particles. Healthy soils provide the basis for life and biodiversity, including habitats, species and genes, and contribute to much less aerial pollution.

In addition, the knowledge, information and data which will be collected through the monitoring requirements enshrined in the proposal will contribute to improve the assessment of environmental impacts of projects, plans and programmes carried out under the Environmental Impact Assessment Directive and Strategic Environmental Assessment Directive.

Lastly the proposal is consistent with the various initiatives in the field of environment such as:

– The EU Biodiversity Strategy for 2030, which sets out targets to further protect nature in the EU and in particular the proposal for a regulation on nature restoration[15] (Nature Restoration Law ('NRL')). The proposed NRL sets out the goal that 20% of the EU's land and sea should be covered by restoration measures by 2030 and that all ecosystems in need of restoration should be covered by restoration measures by 2050. There are many synergies among the proposed NRL and this proposal on soil health. The proposed NRL requires to put in place restoration measures for organic soils in agricultural use constituting drained peatlands. This proposal on soil health will contribute to achieve some of the restoration targets and fulfil the obligations set out in the proposed NRL. For instance, sustainable soil management practices (for example to reduce physical soil disturbance) will help Member States to meet the obligation under the proposed NRL to ensure an increasing trend at national level of the stock of organic carbon. The proposed NRL and this proposal will therefore reinforce each other.

– The Zero Pollution Action Plan, which sets the vision that by 2050 air, water and soil pollution is reduced to levels no longer considered harmful to health and natural ecosystems, and the various proposals aiming to revise and strengthen key existing EU legislation in the air and water sectors as well as the legislation on industrial activities.

– The Circular Economy Action Plan, which announces measures to reduce micro-plastics and an evaluation of the Sewage Sludge Directive, regulating the quality of sludge used in agriculture.

– The Chemicals Strategy for Sustainability, which recognises that chemicals are essential for the well-being of modern society but aims to better protect citizens and the environment against their possible hazardous properties.

15 COM(2022)304.

- **Consistency with other Union policies**

The proposal is consistent with the Union policies on Climate, Food and Agriculture.

The initiative is a crucial centrepiece of the European Green Deal and an instrument to achieve EU policy objectives such as climate neutrality, resilient nature and biodiversity, zero pollution, sustainable food systems, human health and well-being.

The objectives of the proposal are complementary and synergetic with the European Climate Law[16] and will contribute to the EU climate change adaptation objectives by making the EU more resilient and reducing its aim to achieve a climate-neutral Europe by 2050. Achieving this objective relies inter alia on carbon removals through sustainable management of soils to absorb the emissions that will remain at the end of an ambitious decarbonisation pathway. This proposal will also contribute to the EU climate change adaptation objectives and make the EU more resilient and reduce its vulnerability to climate change, e.g. by enhancing the capacity of soils to retain water.

The proposal is fully complementary and synergetic with the Land Use, Land Use Change and Forestry (LULUCF) Regulation[17] and its recent revision to make it fit for the 55% net emission reduction target for 2030. The revised LULUCF Regulation[18] sets an overall EU-level objective of 310 Mt CO2 equivalent of net removals in the LULUCF sector in 2030. For the period from 2026-2030, each Member State will have a binding national target for 2030 for the increase of net greenhouse gas removals. The EU-wide target is to be implemented through binding national targets for the LULUCF sector, requiring Member States to step up ambition for their land use policies. This proposal on soil health and the revised LULUCF Regulation will be mutually reinforcing, since healthy soils sequester more carbon and the LULUCF targets incentivise sustainable management of soils. Enhanced and more representative soil monitoring will also support the LULUCF accounting.

The proposed Carbon Removal Regulation[19] aims to facilitate the deployment of high-quality carbon removals through a voluntary Union certification framework with high climate and environmental integrity. Storing carbon in soil is an essential component of reaching climate neutrality. At the same time, carbon removals constitute a new business model in the voluntary market with carbon credits. This initiative is instrumental in ensuring soil's capacity to absorb and store carbon. Reversely, restoring soil health is instrumental in absorbing and storing soil carbon and generate carbon removal credits. Also, creating soil districts as envisaged under the initiative on soil health as well the data and knowledge that will be generated will facilitate the implementation of the carbon removal certification. Finally, it can

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16 Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (OJ L 243, 9.7.2021).

17 Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (OJ L 156, 19.6.2018, p. 1).

18 Regulation (EU) 2023/839 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/841 as regards the scope, simplifying the reporting and compliance rules, and setting out the targets of the Member States for 2030, and Regulation (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review (OJ L 107, 21.4.2023, p. 1).

19 COM(2022) 672 final.

be expected that certification of healthy soil is likely to increase the value of the carbon removal certificate and provide further social and market recognition for sustainable soil management and related food products. The benefits of healthy soils and recognition of measures to achieve this will also help boost private financing, as food industry and other business have already started putting in place programmes aimed at paying for ecosystem services and supporting sustainable practices related to soil health. At the same time, certification of healthy soil is likely to increase the value of land, e.g. for the purposes of collateral, sale or succession.

This proposal is also consistent with the Farm to Fork Strategy[20] which aims to reduce nutrient losses by at least 50%, while ensuring that there is no deterioration in soil fertility. In addition, the proposal on soil health will contribute to make the EU food system more resilient.

The proposal supports the efforts undertaken by the agriculture sector under the Common Agricultural Policy ('CAP')[21] with its rules to improve the environment in agriculture as well the CAP strategic plans 2023-2027[22]. The CAP provides for support to farmers who commit to undertake specific environmental and climate practices or investments. This policy also includes some environmental and climate conditions (called Good Agricultural and Environmental Conditions, GAECs) to be respected by farmers when receiving CAP income support. Some of these GAECs are linked to soil management practices and are expected to contribute to maintain or enhance soil health. This proposal on soil health will lay down sustainable management principles applicable to managed soils in Europe, including soils used by agriculture, but will leave flexibility at national level to apply these principles, for example the choice between voluntary and mandatory measures and how to integrate these in the CAP strategic plans.

The proposal is fully consistent with the objectives and commitments taken by the EU at international level. Healthy soil directly contributes to the achievement of several of the Sustainable Development Goals (SDG), in particular SDG 2 (zero hunger), 3 (good health and wellbeing), 6 (clean water and sanitation), 11 (sustainable cities and communities), 12 (responsible consumption and production), 13 (climate action) and 15 (life on land). SDG 15.3 aims to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030.

The Union and its Member States, as parties to the Convention on Biological Diversity (CBD), agreed recently at the 15th Conference of Parties the "Kunming-Montreal Global Biodiversity Framework" (GBF) which comprises several targets of relevance for soil health. In the context of United Nations Framework Convention on Climate Change (UNFCCC) soil

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20 Communication from the Commission to the European Parliament, the Council, the European, Economic and Social Committee and the Committee of the Regions, A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system, COM(2020)381 final.

21 Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 (OJ L 435, 6.12.2021, p. 1).

22 https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans_en

carbon sequestration is recognised as an important way to mitigate and adapt to climate change. The Union and its Member States have committed to combat desertification and mitigate the effects of drought, as Parties to the UN Convention to Combat Desertification (UNCCD).

2. LEGAL BASIS, SUBSIDIARITY AND PROPORTIONALITY

• Legal basis

The provisions of this proposal relate to environmental protection. The legal basis for this proposal is therefore Article 192(1) of the Treaty on the Functioning of the European Union that sets out how Article 191 of the Treaty should be implemented. Article 191 of the Treaty provides the objectives of EU environmental policy:

– preserving, protecting and improving the quality of the environment;

– protecting human health;

– utilising natural resources prudently and rationally;

– promoting measures at international level to deal with regional or worldwide environmental problems, in particular to combat climate change.

The proposal does not contain measures affecting land use.

Given that this is an area of shared competence between the EU and the Member States, EU action must respect the subsidiarity principle.

• Subsidiarity (for non-exclusive competence)

Intervention at EU level is justified in view of the scale and cross-border aspects of the problem, the impact of soil degradation across the Union as well as the risks for the environment, economy and society.

Soil degradation is often wrongly considered as a purely local issue while transboundary impacts are underestimated. The drivers and impacts of the problem exceed country borders and reduce the provision of ecosystem services as soil is washed away by water, or blown by winds. Contaminants can become mobile via the air, surface water and groundwater, also across borders, and can affect food.

Healthy soils are essential to tackle global societal challenges. Soils play a key role in the nutrient, carbon and water cycles, and these processes are clearly not constrained by physical and political borders.

Coordinated measures by all Member States are necessary to achieve the vision to have all soils healthy by 2050 as set out in the Soil Strategy for 2030, and to secure the provision of ecosystem services across the EU by the soil in the long-term.

Unless the current degradation of our soils is rapidly reversed, our food system will become less productive and increasingly vulnerable to the changing climate and reliant on resource intensive external inputs. Individual actions of Member States have proven to be insufficient to reverse the situation, since the degradation trend is continuing and even deteriorating.

Given that some aspects of soil health are only fractionally covered by EU legislation, additional EU action is needed to complement existing requirements and to fill the policy gaps.

The proposed action is designed to lay down the conditions to take action and to tackle the costs from soil degradation. The objectives of the proposed action can be better achieved at EU level because of the scale and effects of that action. Coordinated action is needed at sufficiently large scale to monitor and to sustainably manage soils in order to benefit from synergies, effectiveness and efficiency gains. Coordinated action is also needed to deliver on the commitments that rely on soil health made in the Union and in the global context. There is a risk that if soil is not properly protected, the EU and its Member States will fail to fulfil international and European Green Deal commitments on the environment, sustainable development, and climate. Lastly, action at EU level is also essential to address potential distortions in the internal market and unfair competition among businesses, since there are lower environmental requirements in some Member States.

- **Proportionality**

The proposal complies with the proportionality principle because it does not go beyond what is necessary to have all soils in the EU healthy by 2050. The proposed instrument is a directive that leaves much flexibility to the Member States to identify the most appropriate measures and to adapt the approach to local conditions. This is crucial to ensure that the regional and local specificities as regards soil variability, land use, climatological conditions and socio-economic aspects can be properly considered.

The proposal ensures that its objectives are reached with requirements that are both realistic and do not go over what is necessary. For this reason, Member States are allowed sufficient time to gradually put in place the governance, the mechanisms to monitor and assess soil health and the necessary measures to ensure the implementation of the sustainable soil management principles.

To ensure the EU reaches its objectives, the proposal lays down obligations to monitor and assess soil health and to review the effectiveness of the measures taken. The impact assessment evaluated the impacts of all policy options and showed that the proposals are proportionate.

- **Choice of the instrument**

A legislative rather than a non-legislative approach is needed to ensure the long-term objective of healthy soil in the EU by 2050. The proposal provides a coherent framework for soil monitoring and sustainable management as a contribution to the overall objective to be achieved by Member States in 2050. The proposal leaves much flexibility to the Member States to identify the most appropriate measures and to adapt the approach to local conditions. These objectives can be best pursued in the form of a directive. The variability of soil condition and uses across the EU, as well as the need for flexibility and subsidiarity better fit a directive as a legal instrument.

Indeed, a directive requires Member States to achieve its objectives and implement the measures into their national substantive and procedural law systems. This approach gives Member States more freedom when implementing an EU measure than a Regulation, in that

Member States are able to choose the most appropriate means of implementing the measures in the Directive.

3. RESULTS OF EX-POST EVALUATIONS, STAKEHOLDER CONSULTATIONS AND IMPACT ASSESSMENTS

• Ex-post evaluations/fitness checks of existing legislation

Not applicable since there is currently no dedicated existing legislation on soil.

The evaluation of the EU Biodiversity Strategy to 2020 (SWD(2022)284) confirmed that soil degradation and loss and desertification constitute a threat on habitats and species and that nature-based solutions are essential for emission reduction and climate adaptation.

• Stakeholder consultations

The Commission organised a call for evidence on soil health between 16 February 2022 and 16 March 2022 that received 189 replies.

An online public consultation on the possible Soil Health Law for protecting, sustainably managing and restoring soils, was organized between 1 August 2022 and 24 October 2022 on which 5.782 responses were received.

The Commission maintained an open dialogue with Member States through the EU expert group on soil protection since 2015. The group normally met twice a year but has convened eight times only in 2022 to discuss several aspects of the Soil Health Law based on thematic working papers prepared by the Commission's services. As from October 2022 the expert group was enlarged with stakeholder groups other than Member States.

The Commission also organised interviews and sent targeted questionnaires to gather additional views of experts on the costs, feasibility and impacts of certain measures. Answers were collected between 14 and 28 November 2022.

A synopsis report of all consultation activities is annexed to the impact assessment (annex 2). It describes the strategy, method and overview of the feedback received on the various items. The views of the various stakeholders have been fully taken into account when the various policy options have been compared (see annex 10 of the impact assessment).

• Collection and use of expertise

The Commission largely relied on the expertise of the EU expert group on soil protection which discussed several thematic papers prepared by the Commission's services as well as on the internal research expertise developed by the Joint Research Centre (JRC).

The Commission also relied on the publicly available data and knowledge from competent organisations such as the FAO, EEA, IPBES and European Academies Science Advisory Council. Further expertise has been gathered through service contracts.

• Impact assessment

The proposal is based on an impact assessment. After having resolved the issues raised in the Regulatory Scrutiny Board's negative opinion issued on 17 February 2023, the draft impact

assessment received a positive opinion with reservations on 28 April 2023 that were taken into account.

The description of the policy options has been done through five key building blocks which set definitions and obligations for constructing coherent legislation:

(1) definition of soil health and establishment of soil districts,

(2) monitoring of soil health,

(3) sustainable soil management,

(4) identification, registration, investigation and assessment of contaminated sites,

(5) restoration (regeneration) of soil health and remediation of contaminated sites.

Options have been designed for each of the five building blocks, by modulating flexibility and harmonization to different degrees corresponding to meaningful potential solutions. One option was built with the highest degree of flexibility for Member States, another with the highest degree of harmonization and a third has considered an intermediate degree of harmonization and flexibility. Option 1 corresponds to a monitoring only scenario without measures on sustainable soil management, regeneration and remediation, but was discarded at an early stage because it would be insufficient to achieve the policy objectives and to meet the expectations of many stakeholders.

The preferred option is the best combination of the most effective, efficient and policy coherent options selected from each of the building blocks. For all building blocks, except for the remediation of contaminated sites, option 3 with an intermediate level of flexibility and harmonization was chosen (very flexible option 2 for remediation). The preferred option resulting from the impact assessment is based on a staged approach allowing the Member States time to put in place the mechanisms to assess the condition of soils first and decide on the regeneration measures once these conclusions are available.

The preferred option is designed to tackle the costs of soil degradation and in particular the resulting loss of ecosystem services. It ensures that the EU will achieve its policy objectives, such as e.g., healthy soils and the zero-pollution ambition by 2050, in a cost-efficient manner. Most benefits come from the avoided costs by addressing soil degradation, while the highest costs relate to the implementation of measures for sustainable soil management and regeneration. The benefits of the initiative are estimated around EUR 74 billion per year. Total costs would be of the order of EUR 28 to 38 billion per year. For contaminated sites, the annual cost is highly uncertain, and estimated at EUR 1.9 billion for the identification and investigation of contaminated sites and EUR 1 billion annually for the remediation of contaminated sites.

Although it was not possible to quantify and monetise all impacts, the benefit-cost ratio of the preferred option was estimated in a conservative and prudent manner to be positive around 1,7. The Directive requires that Member States should ensure public participation, in particular of the most relevant stakeholders.

The transition to sustainable soil management requires investments to reap the long-term benefits of healthy soils for the environment, economy and society. Successful implementation of the preferred option requires tapping into various sources of funding at

European, national, regional and local level. Therefore, this proposal is accompanied by a Staff Working Document (SWD) with an overview of the 2021-2027 EU Multiannual Financial Framework (MFF) funding opportunities available for the protection, sustainable management, and regeneration of soils. Member States will also be able to continue to exchange knowledge, experience and expertise in several interconnected EU platforms on soil health.

The proposal corresponds to the preferred option for all building blocks except for the building block concerning restoration. The proposal is less demanding in terms of soil regeneration than the preferred option of the impact assessment. The proposal does not require Member States to establish any programmes of measures or soil health plans to avoid additional burden on Member States. The need to establish more specific requirements to restore/regenerate unhealthy soils by 2050 will be subject of a dedicated analysis in the frame of the evaluation of the Directive. This analysis will be based on exchanges with the Member States and the interested parties, and will take into account the conclusions of the assessment of soils, the progress of sustainable soil management as well as the advancement of knowledge on the criteria for the descriptors of soil health.

- **Regulatory fitness and simplification**

The business sectors that are expected to be concerned by the initiative include agriculture and forestry and related extension services, business activities that have polluted soil, business activities related to remediation of contaminated sites, research and laboratories. Soil degradation affects their productivity and competitiveness. Efforts to address this are not rewarded, thus affecting the level playing field.

The implementation of the proposal will create several opportunities for growth and innovation, including for EU SMEs, both for the devise and application of sustainable soil management practices, as well as in relation to the investigation and decontamination of contaminated soils. In addition, the set up of a soil monitoring system is expected to create opportunities for research and development and business to develop new technologies and innovations for monitoring and assessing soil health.

In order to further reduce the administrative burden, the proposal does not require Member States to establish any programmes of measures for sustainable soil management or regeneration. In addition, digital and remote sensing solutions are exploited as much as possible to avoid unnecessary burden. Reporting from the Member States to the Commission will only take place every 6 years and is limited to the information that is necessary for the Commission to undertake its role in overseeing the implementation of the Directive, evaluate it and report on these to the other EU institutions.

- **Fundamental rights**

The proposed Directive respects fundamental rights and observes the principles recognised in particular by the EU Charter of Fundamental Rights. The proposal lays down measures to achieve healthy soils by 2050 and to ensure that soil contamination is reduced to levels no longer considered harmful to human health and the environment. This proposal seeks to integrate into EU policies a high level of environmental protection and improvement in the quality of the environment in accordance with the principle of sustainable development laid

down in Article 37 of the EU Charter of Fundamental Rights. It also puts into concrete terms the obligation to protect the right to life laid down in Article 2 of the Charter.

Further, it contributes to the right to an effective remedy before a tribunal as laid down in Article 47 of the Charter through detailed provisions on access to justice and penalties.

The proposal does not regulate the use of property and respects the right of property laid down in Article 17 of the Charter. However, to fulfil the obligations related to monitoring of soil health (to take soil samples), the competent authorities in the Member States may need to require from landowners the right to accede their property in accordance with the applicable national rules and procedures. Member States may also require from landowners to implement measures to sustainably manage soils.

4. BUDGETARY IMPLICATIONS

The proposal will have budgetary implications for the Commission and for the European Environment Agency (EEA) in terms of human and administrative resources required.

The Commission's implementation and enforcement workload will increase because of this new initiative which sets a framework for soil assessment, monitoring, sustainable management and regeneration that does not exist yet. The Commission will need to manage a new committee, verify the completeness and the conformity of the transposition measures. The Commission will further need to monitor and analyse the data reported by Member States and provide, where need be, guidance to the Member States.

The Commission will strengthen soil monitoring implementation and integration. Scientific support would be obtained also through the launch of administrative arrangements.

The EEA will have an increased workload as a result of the need to set up an infrastructure for reporting the analysis and support for policies on soil protection and integration of soil data with other relevant policy areas. This will require additional resources together with cooperation and synergies with the team working on climate and nature.

The annexed financial statement shows the budgetary implications and the human and administrative resources required.

5. OTHER ELEMENTS

- **Implementation plans and monitoring, evaluation and reporting arrangements**

After the entry into force of the proposed Directive on soil health, Member States will have to adopt, within a period of maximum 2 years, the necessary measures to transpose the Directive and notify these measures to the Commission.

The verification of the completeness of the transposition measures notified by the Member states as well as the verification of the conformity of these measures will be carried out by the Commission based on explanatory documents explaining the relationship between the components of the Directive and the corresponding parts of national transposition instruments.

The proposal on soil health has several provisions on monitoring arrangements. The proposal puts in place a coherent soil monitoring framework which will provide data on soil health in all Member States and for all soils. These data will be made public in accordance with the applicable legislation.

The register of contaminated and potentially contaminated sites will allow both the Commission but also citizens, NGOs and other interested parties to monitor the obligations regarding soil contamination.

Reporting provisions are provided in the proposal on soil health. Member States are required to report to the Commission on a limited number of issues every 6 years.

The proposal provides for an evaluation of the Directive which will be based on the information reported by Member States and any further available information. This evaluation will serve as a basis for the revision of the Directive. The main findings of the evaluation will be transmitted to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

In addition, the proposal allows for adaptation to technical progress.

- **Explanatory documents (for directives)**

The proposed Directive touches on environmental law and aims at regulating at EU level soil health while leaving large flexibility to Member states to achieve its objectives. There is currently no dedicated EU legislation on soil and the proposed Directive contains new concepts and obligations regarding soils which will mainly affect public authorities and stakeholders of the agriculture, forest and industrial sectors.

Member States might use different legal instruments to transpose it and might need to amend existing national provisions. It is likely that the Directive's implementation will not only concern the central/national level of legislation in the Member States, but touch different levels of regional and local legislation. The verification of the transposition of the proposed Directive will be facilitated through explanatory documents. Moreover, explanatory documents can contribute significantly to reducing the administrative burden of compliance monitoring by the Commission; without them, considerable resources and numerous contacts with national authorities would be required to track the methods of transposition in all Member States.

Against this background it is proportionate to ask Member States to take on the administrative burden of providing explanatory documents in order to achieve the objective of putting the Commission in a position to carry out its task of overseeing the transposition of proposed Directive on soil health, which is central to the Green Deal for Europe. It is therefore justified that Member States accompany the notification of their transposition measures with one or more documents explaining the relationship between the components of the Directive and the corresponding parts of national transposition instruments, in accordance with the Joint Political Declaration of 28 September 2011 of Member States and the Commission on explanatory documents.

- **Detailed explanation of the specific provisions of the proposal**

Article 1 sets the overarching objective of the Directive which is to put in place a coherent soil monitoring framework that will provide data on soil health in all Member States and to ensure that EU soils are in healthy condition by 2050 at the latest, so that they can supply multiple services at a scale sufficient to meet environmental, societal and economic needs and to reduce soil pollution to levels no longer considered harmful to human health. The Directive contributes to prevent and mitigate the impacts of climate change, to increase the resilience against natural disasters and to ensure food security.

Article 2 sets the territorial scope of the Directive which applies to all soils in the Union.

Article 3 provides for definitions.

Articles 4 and 5 set out the governance requirements. Article 4 foresees that Member States shall establish soil districts throughout their territory to manage the soils and the requirements of the Directive. Article 4 further lays down some criteria to be considered by Member States when establishing such soil districts. Article 5 requires Member States to appoint the competent authorities for carrying out the duties laid down in the Directive.

Article 6 describes the overall monitoring framework based on the soil districts, to ensure that a regular monitoring of the soil health is carried out. The article also describes the contribution of the Commission to support the efforts of the Member States for the soil health monitoring.

Article 7 lays down the soil descriptors and criteria for the monitoring and assessment of the soil health. The article foresees that some criteria will be established by Member States.

Article 8 sets that Member States shall carry out regular soil measurements. The article further lays down methodologies for determining the sampling points and for measuring the various soil descriptors.

Article 9 requires Member States to assess the soil health based on the regular soil measurements in order to determine whether the soils are healthy or not.

Article 10 lays down sustainable soil management principles which aim to maintain or enhance soil health.

Article 11 provides for mitigation principles to be followed by Member States in case land is taken.

Article 12 sets an overarching obligation to establish a risk-based approach for the identification and investigation of potentially contaminated sites and for the management of contaminated sites.

Article 13 requires that all potentially contaminated sites are identified and article 14 requires that these sites are investigated to confirm the presence of contamination.

Article 15 contains obligations regarding the management of contaminates sites. The Article sets that Member states shall carry out a site-specific risk assessment to determine whether the

contaminated site poses unacceptable risks for human health or the environment and to take the appropriate risk reduction measures.

Article 16 requires Member States to draw up a register of contaminated sites and potentially contaminated sites. The article establishes that the register contains the information set out in Annex VII and that it has to be publicly accessible and kept up to date.

Article 17 contains provisions regarding Union financing.

Articles 18 contains reporting requirements. The article sets that Member States regularly report electronically data and information to the Commission.

Article 19 provides for access to information to increase transparency.

Articles 20 sets out the conditions for the Commission to adopt delegated acts.

Article 21 sets out the conditions for the Commission to adopt implementing acts (Committee procedure).

Article 22 contains requirements for access to justice.

Article 23 requires Member States to lay down the rules on penalties applicable to violations of the national provisions adopted pursuant to the Directive. The penalties shall be effective, proportionate and dissuasive.

Article 24 provides for an evaluation of the Directive.

Article 25 contains requirements regarding the transposition of the Directive into national law.

Article 26 provides for the entry into force of the Directive.

Article 27 provides that the Directive is addressed to the Member States.

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on (...)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 191(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee[23],

Having regard to the opinion of the Committee of the Regions[24],

Acting in accordance with the ordinary legislative procedure,

Whereas:

(1) Soil is a vital, limited, non-renewable and irreplaceable resource that is crucial for the economy, the environment and the society.

(2) Healthy soils are in good chemical, biological and physical condition so that they can provide ecosystem services that are vital to humans and the environment, such as safe, nutritious and sufficient food, biomass, clean water, nutrients cycling, carbon storage and habitat for biodiversity. However, 60 to 70 % of the soils in the EU are deteriorated and continue to do so.

(3) Soil degradation is costing the EU several tens of billion euro per year. Soil health is impacting the provision of ecosystem services that have an important economic return. Sustainable management and regeneration of soils therefore makes sound economic sense and can significantly increase the price and value of the land in the EU.

(4) The European Green Deal[25] has set out an ambitious roadmap to transform the Union into a fair and prosperous society, with a modern, resource-efficient and competitive economy, aiming to protect, conserve and enhance the Union's natural capital, and to protect the health and well-being of citizens from environment-related risks and impacts. As part of the European Green Deal, the Commission has adopted the EU Biodiversity Strategy for 2030[26], the Farm to Fork Strategy[27], the Zero Pollution

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23 OJ C , , p. .

24 OJ C , , p. .

25 Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal COM(2019) 640 final.

26 Communication from the Commission to the European Parliament, the Council the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030, Bringing nature back into our lives COM(2020) 380 final.

Action Plan[28], the EU Climate Adaptation Strategy[29] and the EU Soil Strategy for 2030[30].

(5) The Union is committed to the 2030 Agenda for Sustainable Development[31] and its Sustainable Development Goals[32]. Healthy soils directly contribute to the achievement of several of the Sustainable Development Goals (SDG), in particular SDG 2 (zero hunger), 3 (good health and wellbeing), 6 (clean water and sanitation), 11 (sustainable cities and communities), 12 (responsible consumption and production), 13 (climate action) and 15 (life on land). SDG 15.3 aims to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030.

(6) The Union and its Member States, as parties to the Convention on Biological Diversity, approved by Council Decision 93/626/EEC[33], agreed at the 15th Conference of Parties the "Kunming-Montreal Global Biodiversity Framework" (GBF)[34] which comprises several action-oriented global targets for 2030 of relevance for soil health. Nature's contributions to people, including soil health, should be restored, maintained and enhanced.

(7) The Union and its Member States, as Parties to the UN Convention to Combat Desertification (UNCCD)[35] have committed to combat desertification and mitigate the effects of drought in affected countries. Thirteen Member States[36] have declared themselves under this Convention as party affected by desertification.

(8) In the context of United Nations Framework Convention on Climate Change (UNFCCC) land and soil is considered simultaneously as a source and a sink of carbon. Parties have committed to promote sustainable management, conservation and enhancement of carbon sinks and reservoirs.

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27 Communication from the Commission to the European Parliament, the Council the European Economic and Social Committee and the Committee of the Regions, A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system COM(2020) 381 final.

28 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' COM(2021) 400 final.

29 Communication from the Commission to the European Parliament, the Council, the European, Economic and Social Committee and the Committee of the Regions, Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM(2021)82 final.

30 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate COM(2021) 699 final.

31 https://www.un.org/sustainabledevelopment/development-agenda/

32 https://sdgs.un.org/goals

33 Council Decision of 25 October 1993 concerning the conclusion of the Convention on Biological Diversity (93/626/EEC) (OJ L 309, 13.12.1993, p. 1).

34 Decision adopted by the Conference of the Parties to the Convention on Biological Diversity on 19 December 2022, 15/4. Kunming-Montreal Global Biodiversity Framework.

35 Council Decision of 9 March 1998 on the conclusion, on behalf of the European Community, of the United Nations Convention to combat desertification in countries seriously affected by drought and/or desertification, particularly in Africa (OJ L 83, 19.3.1998, p. 1).

36 Bulgaria, Croatia, Cyprus, Greece, Hungary, Italy, Latvia, Malta, Portugal, Romania, Slovakia, Slovenia, Spain.

(9) The EU Biodiversity Strategy for 2030 states that it is essential to step up efforts to protect soil fertility, reduce soil erosion and increase soil organic matter by adopting sustainable soil management practices and that significant progress is also needed on identifying contaminated soil sites, restoring degraded soils, defining the conditions for their good ecological status, introducing restoration objectives, and improving the monitoring of soil health.

(10) The EU Soil Strategy for 2030 sets the long-term vision that by 2050, all EU soil ecosystems are in healthy condition and are thus more resilient. As a key solution, healthy soils contribute to address the EU's goals of achieving climate neutrality and becoming resilient to climate change, developing a clean and circular (bio)economy, reversing biodiversity loss, safeguarding human health, halting desertification and reversing land degradation.

(11) Funding is vital to enable a transition to healthy soils. The EU Multiannual Financial Framework (MFF) presents several funding opportunities available for the protection, sustainable management, and regeneration of soils. A 'Soil Deal for Europe' is one of the five EU missions of the Horizon Europe programme dedicated to soils and a key instrument for the implementation of this Directive. It aims to lead the transition to healthy soils through funding an ambitious research and innovation programme, establishing a network of 100 living labs and lighthouses in rural and urban areas, advancing the development of a harmonized soil monitoring framework and increasing the awareness of the importance of soil. Other EU funding instruments that present objectives contributing to healthy soils are, among others the Common Agricultural Policy, Cohesion Policy funds, the Programme for Environment and Climate Action (LIFE), the Technical Support Instrument (TSI), Recovery and Resilience Facility (RRF) and InvestEU.

(12) The Soil Strategy announced that the Commission would table a legislative proposal on soil health to enable the objectives of the Soil Strategy and to achieve good soil health across the EU by 2050. In its resolution of 28 April 2021 on soil protection[37], the European Parliament emphasised the importance of protecting soil and promoting healthy soils in the Union, bearing in mind that the degradation of this living ecosystem, component of biodiversity, and non-renewable resource continues, despite the limited and uneven action being taken in some Member States. The European Parliament called on the Commission to design an EU-wide common legal framework, with full respect for the subsidiarity principle, for the protection and sustainable use of soil, addressing all major soil threats.

(13) In its conclusions of 23 October 2020[38], the Council supported the Commission in stepping up efforts to better protect soils and soil biodiversity, as a non-renewable resource of vital importance.

(14) Regulation (EU) 2021/1119 of the European Parliament and of the Council[39] sets out a binding objective of climate neutrality in the Union by 2050 and negative emissions

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37 European Parliament resolution of 28 April 2021 on soil protection (2021/2548(RSP)).

38 Council Conclusions on Biodiversity - the need for urgent action, 12210/20.

39 Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') (OJ L 243, 9.7.2021, p. 1).

thereafter, and to prioritise swift and predictable emission reductions and, at the same time, enhance removals by natural sinks. Sustainable soil management results in increase of carbon sequestration and in most cases in co-benefits for ecosystems and biodiversity.

(15) The Commission's Communication on adaptation to climate change[40] underlined that using nature-based solutions inland, including the restoration of the sponge-like function of soils, will boost the supply of clean, fresh water and reduce risk of flooding and alleviate the impacts of droughts. It is important to maximise the capacity of soils to retain and purify water and reduce pollution.

(16) The Zero Pollution Action Plan adopted by the Commission sets out the vision for 2050 that air, water and soil pollution is reduced to levels no longer considered harmful to health and natural ecosystems and that respect the boundaries our planet can cope with, thus creating a toxic-free environment.

(17) The Commission's Communication on safeguarding food security and reinforcing the resilience of food systems[41] stressed that food sustainability is fundamental for food security. Healthy soils make the EU food system more resilient by providing the basis for nutritious and sufficient food.

(18) This Directive should contribute to meet the Union's objectives on climate and biodiversity, to prevent and respond to droughts and natural disasters, to protect human health and to ensure food security and safety.

(19) Soils host more than 25% of all biodiversity and are the second largest terrestrial carbon pool on the planet. Due to their ability to capture and store carbon, healthy soils contribute to the achievement of the Union's objectives on climate change. High-quality soils also provide a favourable habitat for organisms to thrive and are crucial for enhancing biodiversity and the stability of ecosystems. Biodiversity below and above ground are intimately connected and interact through mutualistic relationships (e.g. mycorrhizal fungi that connect plant roots).

(20) Floods, wildfires and extreme weather events are natural disaster risks of the highest concern across Europe. Droughts and water scarcity are also rapidly increasing, now affecting about ¾ of EU Member States. Healthy soils are instrumental for the resilience and response to droughts and natural disasters. Practices that enhance water retention and nutrient availability in soils, soil structure, soil biodiversity and carbon sequestration, increase the resilience of ecosystems, plants and crops to withstand and recover from drought, natural disasters, extreme weather events and heatwaves that will become more frequent due to climate change. Healthy soils are crucial for disaster prevention, while drought and natural disasters in turn can also cause soil degradation and make soils unhealthy which may require soil management or regeneration measures. Improvement of soil health helps to mitigate the economic losses and

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40 Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM(2021)82 final.

41 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Safeguarding food security and reinforcing the resilience of food systems, COM (2022) 133 final.

fatalities associated with climate-related extremes, that amounted up to 560 billion EUR and more than 182.000 casualties in the EU-27 between 1980 and 2021.

(21) Soil health directly contributes to human health and well-being. Healthy soils provide safe and nutritious food, and have the ability to filter contaminants, hence preserving drinking water quality. Soil contamination can harm human health through ingestion, inhalation or dermal contact. Human exposure to the soil microbial community is beneficial to develop the immune system and resistance against certain diseases and allergies. Healthy soils support the growth of trees, flowers, and grasses, and create green infrastructure that offers aesthetic value and improves well-being, and quality of life.

(22) Soil degradation impacts fertility, yields, pest resistance and nutritional food quality. Since 95% of our food is directly or indirectly produced on soils and the global population continues to increase, it is key that this finite natural resource remains healthy to ensure food security on the long-term and secure the productivity and profitability of EU agriculture. Sustainable soil management practices maintain or enhance soil health and contribute to the sustainability and resilience of the food system.

(23) Addressing the pressures on soils and defining the appropriate measures requires to take account of the variety of type of soils, the specific local and climatic conditions as well as the land use. It is therefore appropriate that Member States establish soil districts within their territories considering these factors as well as the environmental zones used by the Infrastructure for Spatial Information in the European Community (INSPIRE)[42], as well as managing authorities. Soil districts should constitute the basic governance units to manage the soils and the requirements laid down in this Directive, in particular the monitoring and assessment of soil health. There should be a minimum number of soil districts in each Member State taking into account the size of the Member State. This minimum number of soil districts for each Member State shall correspond to the number of NUTS 1 territorial units as defined in Regulation (EC) No 1059/2003 of the European Parliament and of the Council[43].

(24) There is a need to define the minimum common set of measurable criteria for healthy soil condition, which, if not respected would lead to a critical loss in the soil's capacity to function as a vital living system and to provide ecosystem services. Such criteria should reflect and be based on the existing level of soil science.

(25) Each main aspect of soil degradation should be described by soil descriptors that can be measured or estimated. While there is a significant variability of soil types, climatic conditions and land uses, the current scientific knowledge allows also to set criteria at EU level for some of these soil descriptors. However, Member States should be able to adapt the criteria for some of these descriptors according to specific national or local conditions and define the criteria for other descriptors for which common EU criteria cannot be established at this stage. Finally, for those descriptors for which clear criteria that would distinguish between healthy and unhealthy condition cannot be

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42 https://inspire.ec.europa.eu/

43 Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS) (OJ L 154, 21.6.2003, p. 1).

identified now, this Directive imposes only monitoring and assessment obligations. This should facilitate the development of such criteria in future.

(26) Member States should set up mechanisms to recognize the efforts of landowners and land managers to maintain the soil in healthy condition. Such mechanisms may take the form of certification and may be complementary to the certification provided for in the legislative act concerning a Union regulatory framework for carbon removals. The Commission should facilitate soil health certification by inter alia exchanging information and promoting best practices, raising awareness and assessing feasibility of developing recognition of certification schemes at EU level.

(27) Some soils have special characteristics either because they are atypical by nature and constitute rare habitats for biodiversity or unique landscapes or because they have been heavily modified by humans. These characteristics should be taken into account when defining respectively healthy soils and the requirements to achieve healthy soils.

(28) Soil is a limited resource subject to an ever-growing competition for different uses. Land take is a process that transforms natural and semi-natural areas (including gardens and parks) into artificial land development, using soil as a platform for settlements and infrastructure, as a source of raw material or as archive for historic patrimony. This transformation causes the loss, often irreversibly, of the capacity of soils to provide other ecosystem services (provision of food and biomass, water and nutrients cycling, basis for biodiversity and carbon storage). In particular, land take often affects the most fertile agricultural soils, putting food security at risk. Sealed soil also exposes human settlements to higher flood peaks and more intense heat island effects. Therefore, it is necessary to monitor land take and soil sealing and their effects on soil's capacity to provide ecosystem services. It is also appropriate to lay down some land take principles in order to mitigate the impacts of land take.

(29) The assessment of soil health based on the monitoring network should be accurate while keeping the costs of such monitoring at reasonable level. It is therefore appropriate to lay down criteria for sampling points that are representative of the soil condition under different soil types, climatic conditions, and land use. The grid of sampling points should be determined by using geostatistical methods and be sufficiently dense to provide an estimation of the area of healthy soils, at national level, within an uncertainty of not more than 5%. This value is commonly considered to provide a statistically sound estimation and reasonable assurance that the objective has been achieved.

(30) The Commission should assist Member States by continuing to carry out and expanding regular soil surveys (LUCAS soil) as part of the Land Use/Cover Area frame statistical Survey (LUCAS) Programme. Soil health monitoring data from LUCAS soil could then be taken into account by Member States to meet their soil health monitoring obligations. Member States should take the necessary legal arrangements to ensure that the Commission can carry out such surveys.

(31) In order to increase the timeliness and effectiveness of soil health monitoring, the Commission should also develop remote sensing services to support the Member States in monitoring the relevant soil descriptors. Once available and where relevant, Member States should use remote sensing data for assessing the soil health. The monitoring of soil health should make best possible use of existing remote sensing and use space data and services delivered under the Copernicus Programme. The

Copernicus Programme, a component of the Union Space Programme as established by Regulation (EU) 2021/696 of the European Parliament and of the Council[44], is an operational, autonomous, user-driven, civil Earth observation system under civil control, building on the existing national and European capacities, offering geo-information data and services, comprising satellites, ground infrastructure, data and information processing facilities. Copernicus currently ensures an autonomous access to environmental knowledge and key technologies for Earth observation and geo-information services, thereby supporting the Union to achieve independent decision-making and actions in the fields of, inter alia, the environment, climate change, civil protection, land and infrastructure monitoring as well as the digital economy.

(32) Building on the existing EU soil observatory, the Commission should establish a digital soil health data portal which would be a hub gathering soil data from various sources. Such portal would primarily include all the data collected by the Member States and the Commission as required by this Directive. It could also integrate, on a voluntary basis, other relevant soil data collected by Member States or any other party, provided these data meet the format and specifications which should be further laid down by implementing acts.

(33) It is also necessary to improve the harmonization of the various monitoring of soils undertaken by Member States and exploit the synergies between EU and national monitoring systems in order to have comparable data across the EU.

(34) In order to make the widest possible use of soil health data generated in the frame of the monitoring under this Directive, Member States should facilitate the access to these data for relevant stakeholders such as farmers, foresters or local authorities.

(35) To maintain or enhance soil health, soils should be managed sustainably. Sustainable soil management will enable the long-term provision of soil services, including improved air and water quality and food security. It is therefore appropriate to lay down sustainable soil management principles that should guide soil management practices.

(36) Several factors currently hamper a transition to sustainable soil management. These include insufficient internalisation of the environmental cost of common, and often unsustainable, management practices, which often leads to a focus primarily on short-term benefits while potential long-term costs are neglected. Another important aspect is a widespread lack of awareness about the importance of healthy soils and their ecosystems, and insufficient knowledge on how to manage soils so that degradation does not occur. To address these barriers to the adoption of sustainable soil management, supporting, promotional and training activities are needed to raise awareness of the importance of soils and to ensure better knowledge and quality advice for soil managers. Member States should ensure access to impartial and independent advisory services, for which they may make use of the farm advisors referred to in Article 15 of Regulation (EU) 2021/2115 of the European Parliament

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[44] Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU (OJ L 170, 12.5.2021, p. 69).

and of the Council[45] and the system referred to in Article 26 of Regulation of the European Parliament and of the Council [*OP : please insert reference to Regulation of the European Parliament and of the Council the sustainable use of plant protection products and amending Regulation (EU) 2021/2115(COM(2022)305*]. The advice should take into account the data of the soil health monitoring and assessment performed pursuant to this Directive.

(37) Given that different soil types can vary in their response to certain management practices, there is no one-size-fits-all solution to sustainable soil management practices. Therefore, sufficient flexibility at national level is provided to develop tailored approaches that ensure the best possible outcome considering the benefits and costs of these practices depending on soil type and land use. Existing scientific knowledge about different soil management practices, their benefits, and limitations should be considered when deciding on appropriate soil management practices for a given soil type. Since the effects of holistic management concepts such as agroecology or nature-based solutions have already been identified and widely recognized as beneficial, such an approach should be encouraged. However, the best combination of measures to achieve the objectives of this Directive may vary from one Member State to another and even within a Member State. Therefore, this Directive leaves the identification and establishment of sustainable soil management practices to the national level so that they may be adapted to different soil types and land use. The relevant stakeholder groups, such as farmers and foresters or their representatives should be involved in the identification process of sustainable soil management practices on the level of a Member State. The Commission should support the Member States by providing guidance and facilitating the exchange of best practices. Member States should regularly review the effectiveness of the measures taken to implement sustainable soil management principles.

(38) Economic instruments, including those under the Common Agricultural Policy (CAP) that provide support to farmers, should play a crucial role in the transition to the sustainable management of agricultural soils and, to a lesser extent, forest soils. The CAP aims to support soil health through the implementation of conditionality, eco-schemes and rural development measures. Financial support for farmers and foresters who apply sustainable soil management practices can also be generated by the private sector. Sustainability labels in the food, wood, and energy industry, for example, can be based on the sustainable soil management principles set out in this Directive and award higher prices to food, wood, and biomass producers who follow those principles in their production. Additional funding for a network of real-life sites for testing, demonstrating and upscaling of solutions, including on carbon farming, will be provided through the Soil Mission's living labs and lighthouses.

(39) Pursuant to Regulation (EU) 2021/2115 of the European Parliament and of the Council[46], Member States have to describe in their CAP Strategic Plans how the

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[45] Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 (OJ L 435, 6.12.2021, p. 1).

[46] Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common

environmental and climate architecture of the CAP Strategic Plans is meant to contribute to the achievement of, and be consistent with, the long-term national targets set out in, or deriving from, the legislative acts listed in Annex XIII to that Regulation. This Directive should be taken into account when, in accordance with Article 159 of Regulation (EU) 2021/2115, the Commission reviews, by 31 December 2025, the list set out in Annex XIII to that Regulation.

(40) It is necessary to closely monitor the impact of soil management practices and adjust practices and recommendations as necessary, taking into account new knowledge from research and innovation. Valuable contributions are expected in this respect from the Horizon Europe Mission 'A Soil Deal for Europe' and in particular its 'living labs'.

(41) Soil regeneration measures by Member States should contribute to the transition to healthy soils and take into account the outcome of the soil health assessment as well as the impacts on stakeholders. The regeneration measures should be adapted to the specific characteristics of the situation, the type, use and condition of soil and the local, climatic and environmental conditions.

(42) To ensure synergies between the different measures adopted under other EU legislation that may have an impact on soil health and the measures that are to be put in place to sustainably manage and regenerate soils in the Union, Member States should ensure coherence with : the national restoration plans adopted in accordance with Regulation [*OP : please insert Reference of Regulation on nature restoration when adopted*]; of the European Parliament and of the Council[47]; the strategic plans to be drawn up by Member States under the Common Agricultural Policy in accordance with Regulation (EU) 2021/2115, codes of good agricultural practices and action programmes for designated vulnerable zones adopted in accordance with Council Directive 91/676/EEC[48], measures for achieving good ecological and chemical status of water bodies included in river basin management plans prepared in accordance with Directive 2000/60/EC of the European Parliament and of the Council[49], flood risk management measures established in accordance with Directive 2007/60/EC of the European Parliament and of the Council[50], drought management plans promoted in the Union Strategy on Adaptation to Climate Change[51], national action programmes established in accordance with article 10 of the United Nations Convention to Combat Desertification, information on LULUCF actions in accordance with Decision 529/2013/EU of the European Parliament and of the Council[52], integrated national

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agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 (OJ L 435, 6.12.2021, p. 1).

47 COM(2022)304

48 Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1).

49 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, pp. 1-73).

50 Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (OJ L 288, 6.11.2007, p. 27).

51 Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM(2021)82 final.

52 Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land

energy and climate plans in accordance with Regulation (EU) 2018/1999 of the European Parliament and of the Council[53], national air pollution control programmes prepared under Directive (EU) 2016/2284 of the European Parliament and of the Council[54], risk assessments and assessments of the risk management capabilities developed in accordance with Decision No 1313/2013/EU of the European Parliament and of the Council[55], and national actions plans in accordance with Directive 2009/128/EC of the European Parliament and of the Council[56].

(43) Contaminated sites are the legacy of decades of industrial activity in the EU and may lead to risks for human health and the environment now and in the future. It is therefore necessary first to identify and investigate potentially contaminated sites and then, in case of confirmed contamination, to assess the risks and take measures to address unacceptable risks.

(44) The identification of potentially contaminated sites could be based on evidence collected through historical research, pasts industrial incidents and accidents, environmental permits and notifications by the public or authorities.

(45) Soil investigations may follow different stages, such as a desk study, site visit, preliminary or exploratory investigation, more detailed or descriptive investigation, field or laboratory testing. Baseline reports and monitoring measures implemented in accordance with the Directive 2010/75/EU of the European Parliament and of the Council could also qualify as soil investigation where appropriate.

(46) Flexibility is needed to reflect the benefits and costs and take into account local specificities. Member States should therefore adopt a risk-based approach for managing potentially contaminated sites and contaminated sites. A risk-based approach means that management decisions are taken based on the nature and extent of the potential risks for human health and the environment resulting from the exposure of soil contaminants. Member States should define what constitutes an unacceptable risk taking into account existing scientific knowledge, the precautionary principle, local specificities, and current and future land use. A risk-based approach allows to better focus resources taking account of the specific social, economic and environmental context.

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use, land-use change and forestry and on information concerning actions relating to those activities (OJ L 165, 18.6.2013, p. 80).

53 Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council (OJ L 328, 21.12.2018, p. 1).

54 Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p. 1).

55 Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (OJ L 347, 20.12.2013, p. 924).

56 Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (OJ L 309, 24.11.2009, p. 71).

(47) Transparency is an essential component of public policy on soils, to enable public accountability and awareness, fair market conditions and to monitor progress. Therefore, Member States should set up and maintain a national register of potentially contaminated sites and contaminated sites which contains site specific information.

(48) Article 19(1) TEU requires Member States to provide remedies sufficient to ensure effective judicial protection in the fields covered by Union law. In addition, in accordance with the Convention on access to information, public participation in decision-making and access to justice in environmental matters[57] (Aarhus Convention), members of the public concerned should have access to justice in order to contribute to the protection of the right to live in an environment which is adequate for personal health and well-being.

(49) Soil health data are environmental information and should therefore be made public in accordance with the applicable legislation, in compliance with the data protection requirements. The Commission and the Member States should make publicly available information gathered in the frame of the soil health monitoring, and in particular to land owners and land managers as well as to independent advisors.

(50) In order to ensure the necessary adaptation of this Directive, the power to adopt acts in accordance with Article 290 of the Treaty on the Functioning of the European Union should be delegated to the Commission in respect of amending Annexes II, III, IV, V, VI and VII to adapt the methodologies for monitoring soil health, the list of sustainable soil management principles, the indicative list of risk reduction measures, the indicative list of measures, plans and programmes required under other Union legislation, the phases and requirements for the site specific risk assessment and the content of the register of contaminated and potentially contaminated sites, to take account of technical and scientific progress. It is of particular importance that the Commission carries out appropriate consultations during its preparatory work, including at expert level, and that those consultations be conducted in accordance with the principles laid down in the Interinstitutional Agreement on Better Law-Making of 13 April 2016[58]. In particular, to ensure equal participation in the preparation of delegated acts, the European Parliament and the Council receive all documents at the same time as Member States' experts, and their experts systematically have access to meetings of Commission expert groups dealing with the preparation of delegated acts.

(51) In order to ensure uniform conditions for the implementation of this Directive, implementing powers should be conferred on the Commission in order to set out the format, structure and detailed arrangements for reporting data and information electronically to the Commission. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and the Council[59].

(52) The Commission should carry out an evidence-based evaluation and, where relevant, a revision of this Directive 5 years after its entry into force. The evaluation should

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57 Convention on access to information, public participation in decision-making and access to justice in environmental matters – Declaration, (OJ L 124, 17.5.2005).

58 Interinstitutional Agreement between the European Parliament, the Council of the European Union and the European Commission on Better Law-Making of 13 April 2016 (OJ L 123, 12.5.2016, p. 1).

59 Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by the Member States of the Commission's exercise of implementing powers (OJ L 55, 28.2.2011, p. 13).

assess in particular the need to set more specific requirements to make sure unhealthy soils are regenerated and the objective to achieve healthy soils by 2050 is achieved. The evaluation should also assess the need to adapt the definition of healthy soils to scientific and technical progress by adding provisions on certain descriptors or criteria based on new scientific evidence relating to the protection of soils or on the grounds of a problem specific to a Member State arising from new environmental or climatic circumstances. Pursuant to paragraph 22 of the Interinstitutional Agreement on Better Law-Making, that evaluation should be based on the criteria of efficiency, effectiveness, relevance, coherence and EU value added and should provide the basis for impact assessments of possible further measures.

(53) Since the objectives of this Directive cannot be sufficiently achieved by the Member States but can rather, by reason of the scale and effects of the action, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 TEU. In accordance with the principle of proportionality as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.

(54) In accordance with the Joint Political Declaration of 28 September 2011 of Member States and the Commission on explanatory documents[60], Member States have undertaken to accompany, in justified cases, the notification of their transposition measures with one or more documents explaining the relationship between the components of a directive and the corresponding parts of national transposition instruments. With regard to this Directive, the legislator considers the transmission of such documents to be justified.

HAVE ADOPTED THIS DIRECTIVE:

Chapter 1: Common provisions

General provisions

Article 1

Objectives and subject matter

1. The objective of the Directive is to put in place a solid and coherent soil monitoring framework for all soils across the EU and to continuously improve soil health in the Union with the view to achieve healthy soils by 2050 and maintain soils in healthy condition, so that they can supply multiple ecosystem services at a scale sufficient to meet environmental, societal and economic needs, prevent and mitigate the impacts of climate change and biodiversity, increase the resilience against natural disasters and for food security and that soil contamination is reduced to levels no longer considered harmful to human health and the environment.

2. This Directive lays down measures on:

   (a) monitoring and assessment of soil health;

   (b) sustainable management of soils;

60 OJ C 369, 17.12.2011, p. 14.

(c) identification and management of contaminated sites.

Article 2

Scope

This Directive applies to all soils in the territory of Member States.

Article 3

Definitions

For the purposes of this Directive, the following definitions shall apply:

(1) ‘soil’ means the top layer of the Earth’s crust situated between the bedrock and the surface, which is composed of mineral particles, organic matter, water, air and living organisms;

(2) ‘ecosystem’ means a dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit;

(3) ‘ecosystem services’ means indirect contributions of ecosystems to the economic, social, cultural and other benefits that people derive from those ecosystems;

(4) ‘soil health’ means the physical, chemical and biological condition of the soil determining its capacity to function as a vital living system and to provide ecosystem services;

(5) ‘sustainable soil management’ means soil management practices that maintain or enhance the ecosystem services provided by the soil without impairing the functions enabling those services, or being detrimental to other properties of the environment;

(6) ‘soil management practices’ mean practices that impact the physical, chemical or biological qualities of a soil;

(7) ‘managed soils’ means soils where soil management practices are carried out;

(8) ‘soil district’ means the part of the territory of a Member State, as delimited by that Member State in accordance with this Directive;

(9) ‘soil health assessment’ means the evaluation of the health of the soil based on the measurement or estimation of soil descriptors;

(10) ‘contaminated site’ means a delineated area of one or several plots with confirmed presence of soil contamination caused by point-source anthropogenic activities;

(11) ‘soil descriptor’ means a parameter describing a physical, chemical, or biological characteristic of soil health;

(12) ‘land’ means the surface of the Earth that is not covered by water;

(13) ‘land cover’ means the physical and biological cover of the earth’s surface;

(14) ‘natural land’ means an area where human activity has not substantially modified an area’s primary ecological functions and species composition;

(15) ‘semi-natural land‘ means an area where ecological assemblages have been substantially modified in their composition, balance or function by human activities,

but maintain potentially high value in terms of biodiversity and the ecosystem services it provides;

(16) ‘artificial land’ means land used as a platform for settlements and infrastructure or as a source of raw material or as archive for historic patrimony at the expense of the capacity of soils to provide other ecosystem services;

(17) ‘land take’ means the conversion of natural and semi-natural land into artificial land;

(18) ‘reverse land take’ means the conversion of artificial land into natural or semi-natural land;

(19) ‘net land take’ means the result of land take minus reverse land take;

(20) ‘transfer function’ means a mathematical rule that allows to convert the value of a measurement, performed using a methodology different from a reference methodology, into the value that would be obtained by performing the measurement using the reference methodology;

(21) ‘soil contamination’ means the presence of a chemical or substance in the soil in a concentration that may be harmful to human health or the environment;

(22) ‘contaminant’ means a substance liable to cause soil contamination;

(23) ‘soil regeneration’ means an intentional activity aimed at reversing soil from degraded to healthy condition;

(24) ‘risk’ means the chance of harmful effects to human health or the environment resulting from exposure to soil contamination;

(25) ‘soil investigation’ means a process to assess the presence and concentration of contaminants in the soil;

(26) ‘soil remediation’ means a regeneration action that reduces contaminant concentrations in the soil in particular addressed to contaminated sites.

Article 4

Soil districts

1. By (*OP: please insert the date = 3 years after date of entry into force of the Directive*) Member States shall establish soil districts throughout their territory.

   The number of soil districts for each Member State shall facilitate the implementation of Regulation XX *[OP : please insert reference of Regulation on carbon removal certification*] and as a minimum correspond to the number of NUTS 1 territorial units established under Regulation (EC) No 1059/20.

2. When establishing the soil districts, Member States shall take into account existing administrative units and seek homogeneity within soil districts regarding the following parameters:

   (a) soil type;

   (b) climatic conditions or environmental zone;

   (c) land use or land cover class.

Article 5

Competent authorities

By … *(OP: please insert the date = 3 years after date of entry into force of the Directive)* Member States shall designate the competent authorities responsible for carrying out the duties laid down in this Directive in respect of each soil district established under Article 4 and, as relevant at national or regional level.

Chapter 2: Monitoring and assessment of soils

Article 6

Soil health monitoring framework

1. Member States shall establish a monitoring framework based on the soil districts, to ensure that regular and accurate monitoring of soil health is carried out in accordance with this Article and Annexes I and II.

2. Member States shall monitor soil health and land take in each soil district.

3. The monitoring framework shall be based on the following:

   (a) the soil descriptors and soil health criteria referred to in Article 7;

   (b) the soil sampling points to be determined in accordance with Article 8;

   (c) the soil measurements referred to in Article 8 and, where appropriate, Article 6(4) and remote sensing data referred to in Article 6(5);

   (d) the land take and soil sealing indicators referred to in Article 7(1).

4. The Commission, subject to agreement from Member States concerned, shall carry out regular in-situ soil surveys based on the relevant descriptors and methodologies referred to in Articles 7 and 8, to support Member States' monitoring of soil health. Where a Member State provides agreement in accordance with this paragraph, it shall ensure that the Commission can carry out such surveys.

5. The Commission and the European Environment Agency shall develop soil remote sensing, including making use of space-based data and services delivered under the Copernicus Programme established by Regulation (EU) 2021/696, to support the Member States in monitoring the relevant soil descriptors.

6. The Commission and the European Environment Agency shall establish a digital soil health data portal which shall contain relevant soil health data and at least the data resulting from:

   (a) the soil measurements referred to in Article 8;

   (b) the soil surveys referred to in paragraph 4;

   (c) remote sensing referred to in paragraph 5.

   The digital soil health data portal may also contain other soil health related data collected in accordance with the specifications referred to in paragraph 7.

The Commission shall adopt implementing acts to establish formats and methods for the collection, transmission and the integration in the digital soil health data portal of data, other than the ones referred to in points (a), (b) and (c) of paragraph 6.

7. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21.

Article 7

Soil descriptors and soil health criteria

1. When monitoring and assessing soil health, Member States shall apply the soil descriptors and soil health criteria referred to in Annex I.

   When monitoring land take, Member States shall apply the land take and soil sealing indicators referred to in Annex I.

2. Member States may adapt the soil descriptors and the soil health criteria referred to in part A of Annex I, in accordance with the specifications thereof provided.

3. Member States shall determine the organic contaminants for the soil descriptor related to soil contamination referred to in part A of Annex I.

4. Member States shall set soil health criteria for the soil descriptors listed in part B of Annex I in accordance with the provisions of Annex I.

5. Member States may set additional soil descriptors not included in Annex I for monitoring purposes.

Article 8

Measurements and methodologies

1. Member States shall determine sampling points by applying the methodology set out in part A of Annex II.

2. Member States shall carry out regular soil measurements by taking soil samples at the sampling points referred to in paragraph 1 and collect, process and analysis data in order to determine:

   (a) the values of the soil descriptors listed in of Annex I;

   (b) where relevant, the values of the additional soil descriptors set by Member States in accordance with Article 7;

   (c) the values of the land take and soil sealing indicators listed in part D of Annex I.

3. Member States shall apply:

   (a) the methodologies for determining or estimating the values of soil descriptors set out in part B of Annex II;

   (b) the minimum methodological criteria for determining the values of land take and soil sealing indicators set out in part C of Annex II;

   (c) any requirements laid down in accordance with paragraph 6.

Member States may apply other methodologies than the ones listed in points (a), and (b), provided that validated transfer functions are available, or are made available as much as possible, as required in Annex II, part B, fourth column.

4. Member States shall ensure that the first soil measurements start by…(*OP: please insert the date = 3 years after date of entry into force of the Directive*).

5. Member States shall ensure that soil measurements are performed at least every 6 years.

   Member States shall ensure that the value of the land take and soil sealing indicators are updated at least every 2 years.

6. The Commission shall adopt implementing acts to support the harmonization of soil health measurements and related methodologies for the comparability of data and statistics. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21.

7. The Commission is empowered to adopt delegated acts in accordance with Article 20 in order to amend Annex II where necessary to adapt it to scientific and technical progress, in particular in case values of soil descriptors can be determined by remote sensing referred to in Article 6(5).

Article 9

Assessment of the soil health

1. Member States shall assess the soil health in all their soil districts based on the data collected in the context of the monitoring referred to in Articles 6 to 8 for each of the soil descriptors referred to in Annex I.

   Member States shall also take into account where relevant the data collected in the context of soil investigations referred to in Article 14.

   Member States shall ensure that the first soil health assessment is performed by *…(OP : please insert the date = 5 years after date of entry into force of the Directive)* and at least every 6 years.

2. Soil is healthy if it meets the criteria for healthy soil for all soil descriptors listed in parts A and B of Annex I, or as adapted or set in accordance with Article 7, except the soil descriptors excluded in accordance with the fourth column of Annex I (‘healthy soil’).

   Soil is unhealthy if at least one of the criteria referred to in subparagraph 1 is not met (‘unhealthy soil’).

3. Member States shall analyse the values for the soil descriptors listed in part C of Annex I and assess whether there is a critical loss of ecosystem services, taking into account the relevant data and available scientific knowledge.

   Member States shall analyse the values of land take and soil sealing indicators listed in part D of Annex I and assess their impact on the loss of ecosystem services.

4. Based on the assessment of soil health carried out in accordance with this Article, the competent authority shall, where relevant in coordination with local, regional,

national and transnational authorities, identify, in each soil district, the areas in which actions are to be taken to regenerate the soil health under Article 12.

5. Member States shall set up a mechanism for a voluntary soil health certification for land owners and managers pursuant to the soil descriptors referred to in Article 7 and the conditions in paragraph 2 of this Article.

6. The Commission shall facilitate the establishment of soil health certification schemes. Member States shall facilitate free access to soil health data and assessment referred to in Articles 6 to 9 to the relevant land owners, land managers, stakeholders and authorities, in particular to support the development of the advice referred to in Article 10(3).

Chapter 3: Sustainable soil management

Article 10

Sustainable soil management principles

1. By *(OP: please insert the date = 4 years after date of entry into force of the Directive)*, in order to reach the objectives of this Directive as defined in Article 1, Member States shall take the necessary measures on all managed soils, taking into account their type, use and condition.

2. The measures referred to in paragraph 1 shall take into account the outcome of the soil assessments carried out in accordance with Article 9 and include the following:

(a) defining sustainable soil management and regeneration practices, respecting the sustainable soil management principles listed in Annex III, to be gradually implemented on all soils in the Member State;

(b) defining soil management practices and other practices affecting negatively the soil health to be avoided by soil managers;

(c) promoting awareness on the medium- and long-term multiple benefits of sustainable soil management and the need to manage soils in a sustainable manner;

(d) promoting research and implementation of holistic soil management concepts;

(e) making available a regularly updated mapping of available funding instruments to support the implementation of sustainable soil management.

When defining the practices and measures referred to in this paragraph, Member States shall take into account the programmes, plans and measures listed in Annex IV as well as the latest existing scientific knowledge.

In order to ensure synergies, these measures shall be, as far as possible, integrated within the programmes, plans and measures set out in Annex IV, taking into account the latest existing scientific knowledge, and contributing to the achievement of their objectives. Member States shall ensure that the definition of the practices and measures referred to in this paragraph is open, inclusive and effective and that the public concerned, in particular landowners and managers, are given early and effective opportunities to participate in its elaboration.

3. Member States shall ensure easy access to impartial and independent advice on sustainable soil management, training activities and capacity building for soil managers landowners and relevant authorities.

4. Member States shall regularly assess the effectiveness of the measures taken in accordance with this Article and, where relevant, review and revise these measures, taking into account the soil health monitoring and assessment referred to in Articles 6 to 9.

5. The Commission is empowered to adopt delegated acts in accordance with Article 20 to amend Annex III in order to adapt it to scientific and technical progress.

Article 11

Land take mitigation

Member States shall endeavour to ensure that the following principles are respected in case of land take:

- avoid or reduce as much as possible the loss of the capacity of the soil to provide multiple ecosystem services by:
  - reducing the area affected by the land take to the extent possible;
  - selecting areas where the loss of ecosystem services would be minimized or;
  - performing the land take in a way that minimizes the negative impact on soil;
- compensate as much as possible the loss of soil capacity to provide multiple ecosystem services.

Chapter 4: Identification and monitoring of contaminated sites

Article 12

Risk-based approach

1. Member States shall manage the risks for human health and the environment of potentially contaminated sites and contaminated sites, and keep them to acceptable levels, taking account of the environmental, social and economic impacts.

2. By …(*OP : please insert the date =4 years after entry into force of the Directive*) Member States shall establish a risk-based approach for the following:

   (a) the identification potentially contaminated sites in accordance with Article 13;

   (b) the investigation of potentially contaminated sites in accordance with Article 14;

   (c) the management of contaminated sites in accordance with Article 15.

3. The requirement laid down in paragraph 2 is without prejudice to more stringent requirements arising from Union or national legislation.

Article 13

Identification of potentially contaminated sites

1. Member States shall systematically and actively identify all potentially contaminated sites where a soil contamination is suspected ('potentially contaminated sites'), based on evidence collected through all available means.

2. Member States shall identify the potentially contaminated sites taking into account the following criteria:

   (a) operation of an active or inactive potentially contaminating risk activity;

   (b) operation of an activity referred to in Annex I of Directive 2010/75/EU of the European Parliament and of the Council[61];

   (c) operation of an establishment referred to in Directive 2012/18/EU of the European Parliament and of the Council[62];

   (d) operation of an activity referred to in Annex III of Directive 2004/35/CE of the European Parliament and of the Council[63];

   (e) occurrence of a potentially contaminating accident, calamity, disaster, incident or spill;

   (f) any other event liable to cause soil contamination;

   (g) any information resulting from the soil health monitoring carried out in accordance with Articles 6 to 8.

   For the purpose of the first subparagraph point (a), Member States shall lay down a list of potentially contaminating risk activities. Those activities may be further classified according to their risk to cause soil contamination based on historical or scientific evidence.

3. Member States shall ensure that all potentially contaminated sites are identified by *(OP : please insert date = 7 years after entry into force of the Directive)* and are duly recorded in the register referred to in Article 16.

Article 14

Investigation of potentially contaminated sites

1. Member States shall ensure that all potentially contaminated sites identified in accordance with Article 14 are subject to soil investigation.

2. Member States shall lay down the rules concerning the timeframe, content, form and the prioritisation of the soil investigations. Those rules shall be established in accordance with the risk-based approach referred to in Article 12 and the list of potentially contaminating risk activities in Article 13(2).

3. The soil investigations may follow a staged approach.

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61 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (OJ L 334, 17.12.2010, p. 17).

62 Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (OJ L 197, 24.7.2012, p. 1).

63 Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (OJ L 143, 30.4.2004, p. 56)

4. Member States shall also establish the specific events that trigger the investigation and that may complement a one-off or general investigation obligation for all potentially contaminated sites. Such triggering events may include the following:

(a) request or review of environmental or building permit or authorisation required pursuant to Union legislation or to national legislation;

(b) soil excavation activities;

(c) land use changes;

(d) transactions;

(e) periodical investigation obligations.

Article 15

Risk assessment and management of contaminated sites

1. Member States shall lay down the specific methodology to determine the risks of contaminated sites. Such methodology shall be based on the phases and requirements for site-specific risk assessment listed in Annex VI.

2. For each contaminated site identified pursuant to Article 14 or by any other means, the responsible competent authority shall carry out a site-specific assessment for the current and planned land uses to determine whether the contaminated site poses unacceptable risks for human health or the environment.

3. On the basis of the outcome of the assessment referred to in paragraph 2, the responsible competent authority shall take the necessary measures to bring the risks to an acceptable level for human health and the environment ('risk reduction measures').

4. The risk reduction measures may consist of the measures referred to in annex V. When deciding on the appropriate risk reduction measures, the competent authority shall take into consideration the costs, benefits, effectiveness, durability, and technical feasibility of available risk reduction measures.

5. The Commission is empowered to adopt delegated acts in accordance with Article 20 to amend Annex V and Annex VI to adapt it to scientific and technical progress.

Article 16

Register

1. By *...(OP : please insert date = 4 years after entry into force of the Directive*), Member States shall, in accordance with paragraph 2 and in compliance with Union and national law regarding protection of personal data, draw up a register of contaminated sites and potentially contaminated sites.

2. The register shall contain the information set out in Annex VII.

3. The register shall be managed by the responsible competent authority and shall be regularly kept under review and up to date.

4. Member States shall make public the information contained in the register in accordance with Directive 2003/4/EC of the European Parliament and of the

Council[64] and Regulation (EU) 2016/679 of the European Parliament and of the Council[65]. The register shall also be made available in an online georeferenced spatial database.

5. The Commission is empowered to adopt delegated acts in accordance with Article 20 to amend Annex VII.

6. The Commission may adopt implementing acts establishing the format of the register. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21.

Chapter 5: Financing

Article 17

Union financing

Given the priority inherently attached to the establishment of soil monitoring and sustainable management and regeneration of soils, the implementation of this Directive shall be supported by existing Union financial programmes in accordance with applicable rules and conditions.

Chapter 6: Information and reporting by Member States

Article 18

Reporting by Member States

1. Member States shall electronically report the following data and information to the Commission and to the European Environmental Agency (EEA) every 6 years:

   (a) the data and results of the monitoring carried out in accordance with Article 8;

   (b) a trend analysis of the soil health for the descriptors listed in parts A, B, and C of Annex I and for the land take and soil sealing indicators listed in part D of Annex I in accordance with Article 9,

   (c) a summary of the progress on:

      – implementing sustainable soil management principles in accordance with Article 10;

      – implementing the obligations relating to registration, identification, investigation, and management of contaminated sites set out in Articles 12 to 16;

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64 Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC (OJ L 41, 14.2.2003, p. 26).

65 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (OJ L 119, 4.5.2016, p. 1).

(d) the data and information contained in the register referred to in Article 16.

The first reports shall be submitted by … (*OP : please insert date = 6 years after entry into force of the Directive*).

2. Member States shall ensure that the Commission and the EEA have permanent access to the information and data referred to in paragraph 1.

3. Member States shall provide the Commission with:

- a list and spatial data of their soil districts referred to in Article 4 by *...(OP: please insert the date = 3 years and 3 months after date of entry into force of the Directive*);
- a list of the competent authorities referred to in Article 5 by *...(OP: please insert the date = 3 years and 3 months after date of entry into force of the Directive)*.
- the measures and sustainable soil management practices referred to in points (a) and (b) of Article 10(2) by……(*OP: please insert the date = 4 years and 3 months after date of entry into force of the Directive*).

4. Member States shall without undue delay notify the Commission of the rules and measures referred to in Article 23(1) and of any subsequent amendments affecting them.

5. The Commission is empowered to adopt implementing acts specifying the format and the modalities of the submission of the information to be provided in accordance with paragraph 1. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21.

Article 19

Information to the public

1. Member States shall make public the data generated by the monitoring carried out under Article 8 of this Directive, in accordance with Directive 2003/04/EC of the European Parliament and of the Council and Directive 2007/2/EC of the European Parliament and of the Council[66].

2. The Commission shall ensure that soil health data contained in the digital soil health data portal referred to in Article 6 is available to the public in accordance with Regulation (EU) 2018/1725 of the European Parliament and of the Council[67] and Regulation (EU) 2016/679 of the European Parliament and of the Council[68].

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66 Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (OJ L 108, 25.4.2007, p. 1).

67 Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

68 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of

3. Member States shall ensure that the information referred to in Article 18 of this Directive is available to the public in accordance with Directive 2003/4/EC, Directive 2007/2/EC and Directive (EU) 2019/1024 of the Parliament and of the Council[69].

Chapter 6: Delegated and Implementing acts

Article 20

Exercise of the delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.
2. The power to adopt delegated acts referred to in Articles 8, 10, 15 and 16 shall be conferred on the Commission for an indeterminate period of time from the date of entry into force of this Directive.
3. The delegation of power referred to in Articles 8, 10, 15 and 16 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the Official Journal of the European Union or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.
4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law-Making.
5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.
6. A delegated act adopted pursuant to Articles 8, 10, 15 and 16 shall enter into force only if no objection has been expressed either by the European Parliament or the Council within a period of [two months] of notification of that act to the European Parliament and the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

Article 21

Committee

1. The Commission shall be assisted by a committee. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011.
2. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply.

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such data, and repealing Directive 95/46/EC (General Data Protection Regulation) OJ L 119, 4.5.2016, p. 1

[69] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (OJ L 172, 26.6.2019, p. 56).

Chapter 7: Penalties and access to justice

Article 22

Access to justice

Member States shall ensure that members of the public, in accordance with national law, that have a sufficient interest or that maintain the impairment of a right, have access to a review procedure before a court of law, or an independent and impartial body established by law, to challenge the substantive or procedural legality of the assessment of soil health, the measures taken pursuant to this Directive and any failures to act of the competent authorities.

Member States shall determine what constitutes a sufficient interest and impairment of a right, consistently with the objective of providing the public with wide access to justice. For the purposes of paragraph 1, any non-governmental organisation promoting environmental protection and meeting any requirements under national law shall be deemed to have rights capable of being impaired and their interest shall be deemed sufficient.

Review procedures referred to in paragraph 1 shall be fair, equitable, timely and free of charge or not prohibitively expensive, and shall provide adequate and effective remedies, including injunctive relief where necessary.

Member States shall ensure that practical information is made available to the public on access to the administrative and judicial review procedures referred to in this Article.

Article 23

Penalties

1. Without prejudice to the obligations of Member States under Directive 2008/99/EC of the European Parliament and of the Council, Member States shall lay down the rules on penalties applicable to violations by natural and legal persons, of the national provisions adopted pursuant to this Directive and shall ensure that those rules are implemented. The penalties provided for shall be effective, proportionate and dissuasive.

2. The penalties referred to in paragraph 1 shall include fines proportionate to the turnover of the legal person or to the income of the natural person having committed the violation. The level of the fines shall be calculated in such a way as to make sure that they effectively deprive the person responsible for the violation of the economic benefits derived from that violation. In the case of a violation committed by a legal person, such fines shall be proportionate to the legal person's annual turnover in the Member State concerned, taking account, inter alia, the specificities of small and medium-sized enterprises (SMEs).

3. Member States shall ensure that the penalties established pursuant to this Article give due regard to the following, as applicable:

   (a) the nature, gravity, and extent of the violation;

   (b) the intentional or negligent character of the violation;

(c) the population or the environment affected by the violation, bearing in mind the impact of the infringement on the objective of achieving a high level of protection of human health and the environment.

Chapter 8 : Evaluation and review by the Commission

Article 24

Evaluation and review

1. By (*OP :please insert the date = 5 years after the entry into force of the Directive*), the Commission shall carry out an evaluation of this Directive to assess the progress towards the objectives and the need to amend the provisions of this Directive in order to set more specific requirements to make sure unhealthy soils are regenerated and the objective to achieve healthy soils by 2050 is achieved. This evaluation shall take into account at least the following elements:

   (a) the experience gained through the implementation of this Directive;

   (b) the data and information referred to in Article 18,

   (c) relevant scientific and analytical data, including results from research projects funded by the Union;

   (d) an analysis of the gap towards achieving healthy soils by 2050;

   (e) an analysis of the possible need to adapt to scientific and technical progress the provisions of this Directive in particular regarding the following items:

   - the definition of healthy soils;
   - the establishment of criteria for soil descriptors listed in part C of annex I;
   - the addition of new soil descriptors for monitoring purposes;

2. The Commission shall present a report on the main findings of the evaluation referred to in the first paragraph to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions. The report shall be accompanied, where relevant, by a proposal to amend this Directive.

3. Member States shall provide the Commission with the information necessary for the preparation of the report referred to in paragraph 1.

Chapter 9: Final provisions

Article 25

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by date = 2 years after entry into force of the Directive at the latest. They shall forthwith communicate to the Commission the text of those provisions.

When Member States adopt those provisions, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 26

Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Article 27

Addressees

This Directive is addressed to the Member States.

Done at Brussels,

For the European Parliament	*For the Council*
The President	*The President*

LEGISLATIVE FINANCIAL STATEMENT

1. FRAMEWORK OF THE PROPOSAL/INITIATIVE

1.1. Title of the proposal/initiative

1.2. Policy area(s) concerned

1.3. The proposal/initiative relates to:

1.4. Objective(s)

1.4.1. General objective(s)

1.4.2. Specific objective(s)

1.4.3. Expected result(s) and impact

1.4.4. Indicators of performance

1.5. Grounds for the proposal/initiative

1.5.1. Requirement(s) to be met in the short or long term including a detailed timeline for roll-out of the implementation of the initiative

1.5.2. Added value of Union involvement (it may result from different factors, e.g. coordination gains, legal certainty, greater effectiveness or complementarities). For the purposes of this point 'added value of Union involvement' is the value resulting from Union intervention, which is additional to the value that would have been otherwise created by Member States alone.

1.5.3. Lessons learned from similar experiences in the past

1.5.4. Compatibility with the Multiannual Financial Framework and possible synergies with other appropriate instruments

1.5.5. Assessment of the different available financing options, including scope for redeployment

1.6. Duration and financial impact of the proposal/initiative

1.7. Method(s) of budget implementation planned

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2.2.2. Information concerning the risks identified and the internal control system(s) set up to mitigate them

2.2.3. Estimation and justification of the cost-effectiveness of the controls (ratio of "control costs ÷ value of the related funds managed"), and assessment of the expected levels of risk of error (at payment & at closure)

2.3. Measures to prevent fraud and irregularities

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3.3. Estimated impact on revenue

1. FRAMEWORK OF THE PROPOSAL/INITIATIVE

1.1. Title of the proposal/initiative

Proposal for a Directive of the European Parliament and of the Council on (…) .

1.2. Policy area(s) concerned

09 -Environment and Climate Action Activities: 09 02 - Programme for Environment and Climate Action (LIFE) 09 10 – European Environment Agency (EEA)

1.3. The proposal/initiative relates to:

☒ **a new action**

☐ **a new action following a pilot project/preparatory action**[70]

☐ **the extension of an existing action**

☐ **a merger or redirection of one or more actions towards another/a new action**

1.4. Objective(s)

1.4.1. General objective(s)

The objective of the proposed Directive is to contribute to address the big societal challenges of: - Achieving climate neutrality and becoming resilient to climate change - Reversing biodiversity loss and fulfilling international commitments on biodiversity - Reducing pollution to levels no longer considered harmful to human health and the environment - Fulfilling international commitments on land degradation neutrality

1.4.2. Specific objective(s)

Following from the general objective, the specific objective of this proposed Directive is: - To stop soil degradation and achieve healthy soils across the EU by 2050, so ensuring that EU soils can supply multiple ecosystem services at a scale sufficient to meet environmental, societal and economic needs, and reducing soil pollution to levels no longer considered harmful to human health and the environment. Following from the specific objective, the operational objectives are: - To establish measures to stop degrading soils and regenerate soil health. - To establish an effective framework to ensure implementation in particular by the obligation for the Member States to assess soil health as well as for reporting and review.

[70] As referred to in Article 58(2)(a) or (b) of the Financial Regulation.

1.4.3. Expected result(s) and impact

Specify the effects which the proposal/initiative should have on the beneficiaries/groups targeted.

The proposed intiative will deliver significant environmental benefits and improve soil health with knock-on effects on the quality of both water and air, biodiversity, climate benefits and food benefits. It addresses the risks to human health and the environment coming from contaminated sites.

The welfare and well-being of current and future generations depends on soil health.

The implementation of the proposal is expected to create plenty of opportunities for SMEs both for growth (e.g. investigation and remediation of contaminated sites, advisory services for soil health, soil testing labs) and for innovation in the devise and application of sustainable soil management and restoration measures, as well as in relation to the investigation and remediation of contaminated soils.

The implementation of soil monitoring is also expected to create opportunities for research and development and business to develop parameters and soil observation.

1.4.4. Indicators of performance

Specify the indicators for monitoring progress and achievements.

The implementation of the proposal should ensure that soils across the EU are healthy by 2050 and that they are managed sustainable so that they do not further deteriorate.

There are 6 main indicators foreseen to monitor the implementation:

- number of soil health monitoring points

- proportion of the EU territory where soils are in healthy status

- sustainable soil management measures adopted

- regeneration measures put in place

- number of potentially contaminated sites registered in the dedicated national registers

- number of investigated potentially contaminated sites

- number of remediated or properly managed contaminated sites

(1.5. Grounds for the proposal/initiative

1.5.1. Requirement(s) to be met in the short or long term including a detailed timeline for roll-out of the implementation of the initiative

The proposed Directive will entry into force after its adoption but there will be a transposition period of 2 years for the Member States to adopt and notify the laws, regulations and administrative provisions necessary to comply with this Directive.

During this transposition period the Commission will assist Member States via:
- guidance document for the transposition of the Directive;

- development of various guidance and information material if need be regarding the implementation of the Directive

- helpdesk function

After adoption of the Directive, the Commission:

- will regularly convene the specific new committee which will assist the Commission as well as expert group meetings

- take the necessary steps and arrangements to update and put in place the LUCAS soil programme which will complement the monitoring framework of the Member States;

After expiration of the transposition deadline, the Commission will, in accordance with its policy on the verification of the implementation of EU legislation:

- verify the completeness of the transposition measures notified by the Member States and if need be may initiate infringement procedures;

- verify the conformity of the transposition measures Member States and if need be may initiate infringement procedures.

After expiration of the transposition deadline, Member States will need:

- to put in place the appropriate governance
- to establish soil districts
- to put in place the soil monitoring framework including the determination of sampling points and adopting methodologies
- to set up a register of potentially contaminated sites.

1.5.2. *Added value of Union involvement (it may result from different factors, e.g. coordination gains, legal certainty, greater effectiveness or complementarities). For the purposes of this point 'added value of Union involvement' is the value resulting from Union intervention, which is additional to the value that would have been otherwise created by Member States alone.*

Reasons for action at European level (ex-ante)

Drivers and impacts of soil degradation exceed country borders and reduce the provision of ecosystem services throughout the EU and its neighbours. National action has proven to be insufficient to address soil degradation across the EU and has led to divergent levels of protection of the environment and human health.

Expected generated Union added value (ex-post)

Coordinated action at EU level is expected to generate synergies, effectiveness and efficiency gains for monitoring and restoring soil health and ensuring that soils are managed in a sustainable way. Coordinated action is also expected to deliver on the commitments that rely as well on soil health made in the Union and in the global context, namely on addressing climate change, reverse biodiversity loss, aim at zero pollution and achieve land degradation neutrality. Lastly, action at EU level is expected to address potential distortions in the internal market and unfair competition among businesses, since there are lower environmental requirements in some Member States.

1.5.3. Lessons learned from similar experiences in the past

In April 2002, the Commission announced for the first time its intention to develop a Strategy for Soil Protection and to prepare the ground for a proposal for EU soil legislation. A first proposal was subsequently adopted by the Commission in 2006 but difficult political discussions took place in the Council of the EU under successive EU presidencies. No agreement was found due to a blocking minority of five Member States. As a consequence, the Commission withdrew its proposal in 2014.

The debates showed that regulating soil at EU level can trigger resistance from different stakeholder groups and Member States. Therefore, before preparing this new initiative the Commission has invested extensively in meeting and consulting stakeholders and Member States and some through the establishment of the EU expert group on soil protection.

Particular attention was paid to the principles of subsidiarity and proportionality through sufficient flexibility. The proposal also takes largely into account of the variability of soils, climatic conditions and land use.

A more result-oriented approach with clear targets and less focus on the process or measures to be implemented provides more flexibility at national level, while still satisfying the need for protecting soil coherently across the EU.

1.5.4. Compatibility with the Multiannual Financial Framework and possible synergies with other appropriate instruments

The initiative falls under Heading 3 (Natural Resources and Environment), Title 9 (Environment and Climate Action) of the Multiannual Financial Framework (MFF) 2021-2027

The initiative falls under the umbrella of the European Green Deal. It also follows from and contributes to achieving the ambitions set out in the EU Soil Strategy for 2030. The EU Soil Strategy is a key deliverable of the EU biodiversity strategy for 2030 and sets out a framework and concrete measures to protect and restore soils, and ensure that they are used sustainably. It sets as well a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030.

The proposal is complementary to other measures outlined in the Biodiversity Strategy 2030 (such as the nature restoration law) and in the EU Soil Strategy (such as the guidance on risk assessment, soil sealing and funding).

Implementation of the initiative by Member States and businesses will be supported by a range of EU funding such the European Agricultural Guarantee Fund, the European Agricultural Fund for Rural Development, the European Regional and Development Fund, the Cohesion Fund, the Programme for the Environment and Climate Action (LIFE), the Framework Programme for Research and Innovation (Horizon Europe), the Mission “A soil deal for Europe”, the Recovery and Resilience Facility (RRF) , InvestEU, and national financing by EU Member States and private funding.

1.5.5. Assessment of the different available financing options, including scope for redeployment

The implementation of the new Directive will entail new tasks and activities for the Commission. This will require human resources, EEA support, procurement resources for external contractors and one or more administrative arrangement with JRC.

There is currently no dedicated existing EU binding instrument on soil and the implementation and monitoring of the Directive are therefore new responsabilities for the Commission and the Member States.

This requires additional resources with high capacity of political judgement, policy knowledge, analytical skills, independence and resilience throughout the long-term implementation of the legislation. Additional expert support will be equally needed, also through outsourcing, where possible, but core tasks that involve a high degree of political sensitivity need to be carried out by the Commission.

1.6. Duration and financial impact of the proposal/initiative

☐ **limited duration**

– ☐ in effect from [DD/MM]YYYY to [DD/MM]YYYY

– ☐ Financial impact from YYYY to YYYY for commitment appropriations and from YYYY to YYYY for payment appropriations.

☒ **unlimited duration**

– Implementation with a start-up period corresponding to the transposition period of 2 years

– followed by full-scale operation.

1.7. Method(s) of budget implementation planned[71]

☒ **Direct management** by the Commission

– ☒ by its departments, including by its staff in the Union delegations;

– ☐ by the executive agencies

☐ **Shared management** with the Member States

☐ **Indirect management** by entrusting budget implementation tasks to:

– ☐ third countries or the bodies they have designated;

– ☐ international organisations and their agencies (to be specified);

– ☐ the EIB and the European Investment Fund;

– ☒ bodies referred to in Articles 70 and 71 of the Financial Regulation;

– ☐ public law bodies;

– ☐ bodies governed by private law with a public service mission to the extent that they are provided with adequate financial guarantees;

– ☐ bodies governed by the private law of a Member State that are entrusted with the implementation of a public-private partnership and that are provided with adequate financial guarantees;

– ☐ bodies or persons entrusted with the implementation of specific actions in the CFSP pursuant to Title V of the TEU, and identified in the relevant basic act.

– *If more than one management mode is indicated, please provide details in the 'Comments' section.*

Comments

N/A

[71] Details of budget implementation methods and references to the Financial Regulation may be found on the BUDGpedia site: https://myintracomm.ec.europa.eu/corp/budget/financial-rules/budget-implementation/Pages/implementation-methods.aspx

2. MANAGEMENT MEASURES

2.1. Monitoring and reporting rules

Specify frequency and conditions.

The initiative involves procurement, administrative arrangements with the JRC, an increase of the EU subsidy to the EEA and impact on the COM HR. Standard rules for this type of expenditure apply.

2.2. Management and control system(s)

2.2.1. Justification of the management mode(s), the funding implementation mechanism(s), the payment modalities and the control strategy proposed

N/A –cf. above.

2.2.2. Information concerning the risks identified and the internal control system(s) set up to mitigate them

N/A –cf. above.

2.2.3. Estimation and justification of the cost-effectiveness of the controls (ratio of "control costs ÷ value of the related funds managed"), and assessment of the expected levels of risk of error (at payment & at closure)

N/A –cf. above.

2.3. Measures to prevent fraud and irregularities

Specify existing or envisaged prevention and protection measures, e.g. from the Anti-Fraud Strategy.

N/A –cf. above.

3. ESTIMATED FINANCIAL IMPACT OF THE PROPOSAL/INITIATIVE

3.1. Heading(s) of the multiannual financial framework and expenditure budget line(s) affected

- Existing budget lines

In order of multiannual financial framework headings and budget lines.

Heading of multiannual financial framework	Budget line	Type of expenditure	Contribution			
	Number	Diff./Non-diff.[72]	from EFTA countries[73]	from candidate countries and potential candidates[74]	fromother third countries	other assigned revenue
3	09 02 01 Nature and biodiversity	Diff	YES	NO	YES	NO
3	09 10 02 European Environment Agency	Diff.	YES	YES	NO	NO
7	20 01 02 01 – Remuneration and allowances	Non-diff.	NO	NO	NO	NO
7	20 02 01 03 – National civil servants temporarily assigned to the institution	Non-diff.	NO	NO	NO	NO
7	20 02 06 01 - Mission and representation expenses	Non-diff.	NO	NO	NO	NO
7	20 02 06 02 – Meetings, expert groups	Non-diff.	NO	NO	NO	NO
7	20 02 06 03 – Committees	Non-diff.	NO	NO	NO	NO

- New budget lines requested: N/A

[72] Diff. = Differentiated appropriations / Non-diff. = Non-differentiated appropriations.
[73] EFTA: European Free Trade Association.
[74] Candidate countries and, where applicable, potential candidates from the Western Balkans.

3.2. Estimated financial impact of the proposal on appropriations

3.2.1. Summary of estimated impact on operational appropriations

– ☐ The proposal/initiative does not require the use of operational appropriations

– ☒ The proposal/initiative requires the use of operational appropriations, as explained below:

EUR million (to three decimal places)

Heading of multiannual financial framework	3	Natural resources and environment

DG: ENV			2023	2024	2025	2026	2027 and beyond	**TOTAL**
○ Operational appropriations								
09 02 01 Nature and biodiversity	Commitments	(1a)		0,500	0,500	0,500	0,500	2,000
	Payments	(2a)		0,500	0,500	0,500	0,500	2,000
Appropriations of an administrative nature financed from the envelope of specific programmes[75]								
Budget line		(3)						
TOTAL appropriations for DG ENV	Commitments	=1a+3		0,500	0,500	0,500	0,500	2,000
	Payments	=2a +3		0,500	0,500	0,500	0,500	2,000

The amount reported above will be needed to support various implementation tasks related to the legislative provisions that will be carried out by DG ENV and JRC.

[75] Technical and/or administrative assistance and expenditure in support of the implementation of EU programmes and/or actions (former 'BA' lines), indirect research, direct research.

The procured activities include a general support contract for the implementation of the proposal.

In addition, administrative arrangement(s) with JRC have been included in this category, in particular for establishing an integrated monitoring.

	All costs except HR and Administrative		(EUR million (to three decimal places)				
tasks	**resources**	**2023**	**2024**	**2025**	**2026**	**2027 and beyond**	**total**
General support for implementing the directive (for developing technical guidance, providing support for MSs transposition and implementation, etc.)	Service contract/ External experts		0,150	0,150	0,150	0,150	0,600
Additional financial contribution (part of DG ENV) for the run of the LUCAS Survey and its LUCAS Soil module (pending the definition of contribution of other DGs)[76].			0,000	0,000	0,000	0,000	0,000
Upgrading EUSO, Soil Health dashboard, LUCAS Soil; integrate LUCAS Soil and MS data; facilitate harmonization of methodologies Provide support for transposing and implementing the Directive, in particular concerning land take and soil contamination, integrating MS monitoring elements and promoting harmonization	Administrative arrangement between ENV - JRC		0,350	0,350	0,350	0,350	1,400
Total			0,500	0,500	0,500	0,500	2,000

[76] Up to 2022 LUCAS Survey has been implemented through budgetary delegation from several DGs; based on latest contributions from DG ENV, corresponding to 1,100 K€ per year, no additional amount is expected to be needed from DG ENV; since the directive requires a regular monitoring, a dedicated budgetary envelope and budget line is to be envisaged in the next MFF, implemented in agreement with all the DGs involved (for instance through a Memorandum of Understanding).

Agency: EEA			2023	2024	2025	2026	2027 and beyond	TOTAL
Title 1: Staff expenditure	Commitments	(1a)	0,000	0,000	0,235	0,479	0,489	1,203
	Payments	(2a)	0,000	0,000	0,235	0,479	0,489	1,203
Title 2: Infrastructure	Commitments	(1b)	0,000	0,000	0,000	0,000	0,000	0,000
	Payments	(2b)	0,000	0,000	0,000	0,000	0,000	0,000
Title 3: Operational expenditure	Commitments	(1c)	0,000	0,000	0,130	0,280	0,235	0,645
	Payments	(2c)	0,000	0,000	0,130	0,280	0,235	0,645
TOTAL appropriations for agency EEA	Commitments	=1a+1b +1c	0,000	0,000	0,365	0,759	0,724	1,848
	Payments	=2a+2b +2c	0,000	0,000	0,365	0,759	0,724	1,848

Notes on EEA expenditure:

Title 1: this title is composed by 2 additional TA starting in 2025:

1 TA to provide support to the European Commission and Member States for the set up, implementation and assessment of the data management system .

Tasks:

(1) Set up, in synergy and coordination with other relevant systems, an architecture to exchange data flows through Reportnet and EIONET to collect, process, validate and analyse data reported by MS every 6 years:

- Data and results of the monitoring
- Trend analysis of soil descriptors and indicators
- Summary and progress on implementation of SSM and regeneration
- Data in national registers for contaminated sites

(2) Assist the Commission with the evaluation of the implementation of the Directive.

1 TA to provide support to the European Commission and Member States on implementing methodologies and policy overview.

Tasks:

(1) Support development of an overview at EU level of national registries on contaminated sites and reporting from Member States, overview of defined terminologies, criteria to define potentially contaminated sites and lists of potentially contaminating risk activities, national triggers and rules for soil investigation, reporting specifications and schema.

(2) Provide a regularly updated overview of risk assessment methodologies implemented at national level (including screening values), support development of guidance on risk assessment methods and support Member States to apply the guidance as relevant.

(3) Support the development of an overview at EU level of MS targets and indicators on land take and sealing (every 2 year), and publish and disseminate policy-relevant data through dashboards and clear online visualisations of the data.

(4) Provide support to MS to implement indicators compliant with definitions and requirements in the directive

(5) , to implement the land take hierarchy and keep track of the methodologies applies in MS.

(6) Develop guidance for using and interpreting Copernicus data and deriving statistics from status and change assessments.

(7) Develop guidance for practical solutions towards the net land take target setting, actions for achieving it and related monitoring.

Title 2: Infrastructure (mainly IT systems/databases developement) – IT solutions are planned to be developed by the 2 additional TA in Title 1

The Title 3 costs is composed by the following itemisation of operational costs:

	2025 (EUR)	2026 (EUR)	2027 (EUR)
Design phase and first IT developments: development of register of contaminated sites, preparation for soil monitoring and ongoing maintenance.	60.000	110.000	35.000
Running costs of the reporting system	0	0	20.000
MS/Stakeholder (including EIONET) meetings 1 physical per year EUR 30 000	30.000	30.000	30.000
Support contracts for contaminated soil and land use expertise (service contracts, studies). Development of guidance documentation, clarification of definitions (bulk of work slit over years 1 and 2).	40.000	140.000	150.000

○ TOTAL operational appropriations	Commitments	(4)						
	Payments	(5)						
○ TOTAL appropriations of an administrative nature financed from the envelope for specific programmes		(6)						
TOTAL appropriations under HEADING 3 ENV+EEA of the multiannual financial framework	Commitments	=4+ 6	0,000	0,500	0,865	1,259	1,224	3,848
	Payments	=5+ 6	0,000	0,500	0,865	1,259	1,224	3,848

○ TOTAL operational appropriations (all operational headings)	Commitments	(4)						
	Payments	(5)						
TOTAL appropriations of an administrative nature financed from the envelope for specific programmes (all operational headings)		(6)						
TOTAL appropriations under HEADINGS 1 to 6 of the multiannual financial framework	Commitments	=4+ 6	0,000	0,500	0,865	1,259	1,224	3,848
	Payments	=5+ 6	0,000	0,500	0,865	1,259	1,224	3,848

Heading of multiannual financial framework	7	'Administrative expenditure'

This section should be filled in using the 'budget data of an administrative nature' to be firstly introduced in the Annex to the Legislative Financial Statement (Annex 5 to the Commission decision on the internal rules for the implementation of the Commission section of the general budget of the European Union), which is uploaded to DECIDE for interservice consultation purposes.

EUR million (to three decimal places)

		2023	2024	2025	2026	2027 and beyond	TOTAL
DG: ENV							
○ Human resources			0,528	0,699	0,699	0,870	2,796
○ Other administrative expenditure		0,031	0,062	0,110	0,110	0,110	0,423
TOTAL DG ENV	Appropriations	0,031	0,590	0,809	0,809	0,980	3,219

The cost per FTE (AD/AST) is calculated at EUR 171 000/y. The other administrative expenditure accounts for Committee and expert group meetings, missions and other costs associated with this personnel.

		2023	2024	2025	2026	2027 and beyond	TOTAL
DG: JRC							
○ Human resources			0,342	0,513	0,513	0,513	1,881
○ Other administrative expenditure							
TOTAL DG JRC	Appropriations		0,342	0,513	0,513	0,513	1,881

TOTAL appropriations under HEADING 7	(Total commitments = Total payments)	0,031	0,932	1,322	1,322	1,493	5,100

of the multiannual financial framework							

EUR million (to three decimal places)

		2023	2024	2025	2026	2027 and beyond	**TOTAL**
TOTAL appropriations under HEADINGS 1 to 7 of the multiannual financial framework	Commitments	0,031	1,432	2,187	2,581	2,717	8,948
	Payments	0,031	1,432	2,187	2,581	2,717	8,948

3.2.2. Estimated output funded with operational appropriations

Commitment appropriations in EUR million (to three decimal places)

Indicate objectives and outputs ⇩			Year **N**		Year **N+1**		Year **N+2**		Year **N+3**		Enter as many years as necessary to show the duration of the impact (see point 1.6)						**TOTAL**	
	OUTPUTS																	
	Type[77]	Average cost	No	Cost	No	Cost	No	Cost	No	Cost	No	Cost	No	Cost	No	Cost	Total No	Total cost
SPECIFIC OBJECTIVE No 1[78]…																		
- Output																		
- Output																		

[77] Outputs are products and services to be supplied (e.g.: number of student exchanges financed, number of km of roads built, etc.).

[78] As described in point 1.4.2. 'Specific objective(s)…'

- Output																		
Subtotal for specific objective No 1																		
SPECIFIC OBJECTIVE No 2 ...																		
- Output																		
Subtotal for specific objective No 2																		
TOTALS																		

3.2.3. Estimated impact on EEA's human resources and administrative appropriations

3.2.3.1 Estimated impact on EEA's human resources

– ☒ The proposal/initiative does not require the use of appropriations of an administrative nature

– ☐ The proposal/initiative requires the use of appropriations of an administrative nature, as explained below:

EUR million (to three decimal places)

	2023	**2024**	**2025**	**2026**	**2027 and beyond**	**TOTAL**
Temporary agents (AD Grades)			0.235	0.479	0.489	**1.203**
Temporary agents (AST grades)						
Contract staff						
Seconded National Experts						
TOTAL			0.235	0.479	0.489	**1.203**

Staff requirements (FTE):

	2023	**2024**	**2025**	**2026**	**2027 and beyond**	**TOTAL**
Temporary agents (AD Grades)			2	2	2	
Temporary agents (AST grades)						
Contract staff						
Seconded National Experts						
TOTAL			**2**	**2**	**2**	

3.2.3.2 Estimated requirements on administrative appropriations in the Commission

– ☐ The proposal/initiative does not require the use of appropriations of an administrative nature

– ☒ The proposal/initiative requires the use of appropriations of an administrative nature, as explained below:

EUR million (to three decimal places)

	2023	2024	2025	2026	2027	**TOTAL**
HEADING 7 of the multiannual financial framework						
Human resources	0,000	0,870	1,212	1,212	1,383	4,677
Other administrative expenditure	0,031	0,062	0,110	0,110	0,110	0,423
Subtotal HEADING 7 of the multiannual financial framework	0,031	0,932	1,322	1,322	1,493	5,100

The cost per FTE (AD/AST) is calculated at EUR 171 000/y. The "other administrative expenditure" accounts for Committee and expert group meetings, missions and other costs associated with this personnel.

Outside HEADING 7[79] of the multiannual financial framework	N/A	N/A	N/A	N/A	N/A	N/A
Human resources						
Other expenditure of an administrative nature						
Subtotal outside HEADING 7 of the multiannual financial framework	N/A	N/A	N/A	N/A	N/A	N/A

TOTAL	0,031	0,932	1,322	1,322	1,493	5,100

The appropriations required for human resources and other expenditure of an administrative nature will be met by appropriations from the DG that are already assigned to management of the action and/or have been redeployed within the DG, together if necessary with any additional allocation which may be granted to the managing DG under the annual allocation procedure and in the light of budgetary constraints.

[79] Technical and/or administrative assistance and expenditure in support of the implementation of EU programmes and/or actions (former 'BA' lines), indirect research, direct research.

3.2.3.1. Estimated requirements of human resources

– ☐ The proposal/initiative does not require the use of human resources.

– ☒ The proposal/initiative requires the use of human resources, as explained below:

Estimate to be expressed in full time equivalent units

		2023	2024	2025	2026	2027 and beyond
20 01 02 01 (Headquarters and Commission's Representation Offices) - DG ENV			2	3	3	4
20 01 02 01 (Headquarters and Commission's Representation Offices) - JRC			2	3	3	3
20 01 02 03 (Delegations)						
01 01 01 01 (Indirect research)						
01 01 01 11 (Direct research)						
Other budget lines (specify)						
20 02 01 (AC, END, INT from the 'global envelope') – DG ENV			2	2	2	2
20 02 03 (AC, AL, END, INT and JPD in the delegations)						
XX 01 xx **yy zz** [9]	- at Headquarters					
	- in Delegations					
01 01 01 02 (AC, END, INT - Indirect research)						
01 01 01 12 (AC, END, INT - Direct research)						
Other budget lines (specify)						
TOTAL			6	8	8	9

XX is the policy area or budget title concerned.

The human resources required will be met by staff from the DG who are already assigned to management of the action and/or have been redeployed within the DG, together if necessary with any additional allocation which may be granted to the managing DG under the annual allocation procedure and in the light of budgetary constraints.

Those additional resources result to be needed after having considered all possible synergies in order to minimize the number of additional staff. The amount of additional staff required is justified by the need to set up several completely new systems with several very different elements, to be integrated with several other policies, under a high political and technical complexity, and where the Member States will need a very significant amount of support, guidance and scrutiny. This is reflected in the detailed tasks to be carried out.

Description of tasks to be carried out:

Officials and temporary staff ENV	Prepare and lead the development of technical guidance and provide support to Member States in the transposition and implementation of the initiative, in particular in the field of: soil health criteria, sampling, data, methodology, assessment, monitoring and analysis; soil districts; land take; register of contaminated sites. Sustain a dialogue on soil health with Member States, their competent authorities and EEA including in the framework of relevant expert groups and committees; report to EP and Council. Prepare and lead: the monitoring and verification of the transposition and implementation of the law by Member States; the adaptation of the EU Soil Observatory and its dashboard on soil health, integrating as well Member States data; the adaptation of the EU statistical survey LUCAS to the new requirements of the law. Prepare and lead the adoption of any new Commission implementing acts, updating annexes
External staff	SNEs to provide expertise on national systems, constraints and opportunities for the formulation of effective guidance and an effecive and efficient support to Member

	States on transposition and implementation
Officials and temporary staff JRC	Lead the upgrading of EUSO and Soil health dashboard to Directive's requirements Provide technical support for helping MS transposing and implementing the Drective Facilitate filling in the knowledge gaps related to the directive, interfacing with research programmes, e.g. for any needed update of the directive's annexes Provide the necessary relevant knowledge update for ENV policy tasks related to the directive Upgrade LUCAS Soil to make it consistent with Directive's requirements

3.2.4. Compatibility with the current multiannual financial framework

The proposal/initiative:

– ☒ can be fully financed through redeployment within the relevant heading of the Multiannual Financial Framework (MFF).

The additional tasks the Commission has to assume, require an additional needs for resources as regards the amount of the Union's contribution and the establishment plan posts of the European Environmental Agency. These will be offset from the LIFE Programme, budget line 09.0201 – LIFE Nature & Biodiversity. The costs foreseen under the budget line 09 02 01 will be borne by the LIFE programme and will be planned under the annual management plan exercises of DG ENV. The human resources required shall be preferably met by an additional allocation under the annual allocation procedure of human resources

- ☐ requires use of the unallocated margin under the relevant heading of the MFF and/or use of the special instruments as defined in the MFF Regulation.

– ☐ requires a revision of the MFF.

Explain what is required, specifying the headings and budget lines concerned and the corresponding amounts.

3.2.5. Third-party contributions

The proposal/initiative:

– ☒ does not provide for co-financing by third parties

– ☐ provides for the co-financing by third parties estimated below:

Appropriations in EUR million (to three decimal places)

	Year **N**[80]	Year **N+1**	Year **N+2**	Year **N+3**	Enter as many years as necessary to show the duration of the impact (see point 1.6)			Total
Specify the co-financing body								
TOTAL appropriations co-financed								

[80] Year N is the year in which implementation of the proposal/initiative starts. Please replace "N" by the expected first year of implementation (for instance: 2021). The same for the following years.

3.3. Estimated impact on revenue

– ☒ The proposal/initiative has no financial impact on revenue.

– ☐ The proposal/initiative has the following financial impact:

  – ☐ on own resources

  – ☐ on other revenue

  – please indicate, if the revenue is assigned to expenditure lines ☐

EUR million (to three decimal places)

Budget revenue line:	Appropriations available for the current financial year	Impact of the proposal/initiative[81]						
		Year **N**	Year **N+1**	Year **N+2**	Year **N+3**	Enter as many years as necessary to show the duration of the impact (see point 1.6)		
Article …….								

For assigned revenue, specify the budget expenditure line(s) affected.

[…]

Other remarks (e.g. method/formula used for calculating the impact on revenue or any other information).

[…]

[81] As regards traditional own resources (customs duties, sugar levies), the amounts indicated must be net amounts, i.e. gross amounts after deduction of 20 % for collection costs.

EUROPEAN
COMMISSION

Strasbourg, XXX
[…](2023) XXX draft

ANNEXES 1 to 7

ANNEXES

to the proposal for a Directive of the European Parliament and of the Council on (...)

[…]

[…]

ANNEX I

SOIL DESCRIPTORS AND INDICATORS, AND CRITERIA FOR HEALTHY SOIL CONDITION

Aspect of soil degradation	**Soil descriptor**	**Criteria for healthy soil condition**	**Land areas that shall be excluded from achieving the related criterion**
Salinization	Electrical Conductivity (deci-Siemens per meter)	<4 dS m−1;	Naturally saline soils; Soils directly affected by sea level rise
Soil erosion	Soil erosion rate (tonnes per hectare per year)	≤ 2 tonnes/hectare/year	Badlands and other unmanaged natural areas, except if they represent a significant disaster risk
Loss of soil organic carbon	Soil Organic Carbon (SOC) concentration (g/kg)	- For organic soils[1]: respect targets set at national level under Regulation (EU) XXX of the European Parliament and of the Council (*OP: please insert the reference of the Regulation on nature restoration after adoption (COM(2022)304*)[2]	No exclusion
		- For mineral soils: SOC/Clay ratio > 1/13; Member States may apply a corrective factor where specific climatic conditions would justify it, taking into account the actual SOC content in permanent grasslands.	Non- managed soils in natural areas

[1] The term 'organic soil' is defined in IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds).

[2] COM(2022) 304 final, article 4.1 together with article 4.2 for what concerns Annex I Group 1 - Wetlands, article 9.4.

<table>
<tr>
<td>Subsoil compaction</td>
<td>Bulk density in subsoil (B horizon[3]); Member States can replace this descriptor with an equivalent parameter (g/cm3)</td>
<td>
<table>
<tr><td>Soil texture[4]</td><td>range</td></tr>
<tr><td>sands, loamy sands, sandy loams, loams</td><td><1.8</td></tr>
<tr><td>Sandy clay loams, loams, clay loams, silts, silt loams</td><td><1.75</td></tr>
<tr><td>silt loams, silty clay loams</td><td><1.65</td></tr>
<tr><td>Sandy clays, silty clays, clay loams with 35-45%clay</td><td><1.58</td></tr>
<tr><td>Clays</td><td><1.47</td></tr>
</table>

In case a Member State replaces the descriptor “bulk density in subsoil” with an equivalent parameter, it shall adopt a related equivalent criterion.
</td>
<td>Non-managed soils in natural areas</td>
</tr>
<tr>
<td>Excess nutrient content in soil</td>
<td>Extractable phosphorus (mg/kg)</td>
<td>< “maximum value”;
The “maximum value” is to be laid down by the Member State within the range 30-50 mg/kg</td>
<td>No exclusion</td>
</tr>
</table>

[3] As defined in the FAO Guidelines for Soil Description, Chapter 5 (https://www.fao.org/3/a0541e/a0541e.pdf)

[4] As defined in Arshad, M.A., B. Lowery, and B. Grossman. 1996. Physical tests for monitoring soil quality. p.123- 142. In: J.W. Doran and A.J. Jones (eds.) Methods for assessing soil quality. Soil Sci. Soc. Am. Spec. Publ. 49. SSSA, Madison, WI.

Soil contamination	- concentration of heavy metals in soil: As, Sb, Cd, Co, Cr (total), Cr (VI), Cu, Hg, Pb, Ni, Tl, V, Zn (mg/kg for all except µg/kg for Hg) - concentration of a selection of organic contaminants defined by Member States and taking into account existing EU legislation (e.g. on water quality and air emissions)	Reasonable assurance that no unacceptable risk for human health and the environment exist from soil contamination[5,6]	No exclusion
Reduction of soil capacity to retain water	Soil water holding capacity (% of volume of water / volume of saturated soil)	The estimated value for the total water holding capacity of a soil district by river basin or subbasin is above the minimal threshold. The minimal threshold is set (in tonnes) by the Member State at soil district and river basin or subbasin level to mitigate the impacts of floodings following intense rain events or of periods of low soil moisture due to drought events.	No exclusion

Part C: soil descriptors without criteria	
Aspect of soil degradation	**Soil descriptor**
Excess nutrient content in soil	Nitrogen in soil (mg/kg)

[5] Member States are expected to obtain reasonable assurance from soil point sampling, identification and investigation of contaminated sites and any other relevant information

[6] Habitats with naturally high concentration of heavy metals under Annex I of Habitat Directive 92/43/EEC shall remain protected

Acidification	pH
Topsoil compaction	Bulk density in topsoil (A-horizon[7]) (g/cm3)
Loss of soil biodiversity	Potential soil basal respiration (µL O2/(g soil dry weight·hour)) Additionally, Member States may select other soil biodiversity descriptors such as: - Metabarcoding of bacteria, fungi and animals; - Abundance and diversity of nematodes; - Microbial biomass; - Abundance and diversity of earthworms (in cropland)

Part D: land take and soil sealing indicators	
Aspect of soil degradation	**Land take and soil sealing indicators**
Artificialization and soil sealing	Land taken (total km² and % of Member State surface) Net land take (average per year - in km² and % of Member State surface) Soil sealing (total km² and % of Member State surface) Additionally, Member States may measure other related indicators such as: Land fragmentation Land recycling rate Land taken for commercial activities, logistic hubs, renewable energies, surfaces such as airports, roads, mines Consequences of land take such as quantification of loss of ecosystem services, change in floods intensity

[7] As defined in the FAO Guidelines for Soil Description, Chapter 5 (https://www.fao.org/3/a0541e/a0541e.pdf)

ANNEX II

METHODOLOGIES

Part A: methodology for determining sampling points

Activity	**Minimum criteria for methodology**
Determination of soil sampling points (sample survey)	The sample survey shall be designed from a complete sample frame containing the best available information on the soil properties distribution, which shall include both national and LUCAS Soil measurements. The sampling scheme shall be a stratified sampling optimized on the soil health descriptors. The size of the national sample shall meet the requirement of a maximum percent error (or Coefficient of Variation) of 5% for the estimation of the area having healthy soils. The Commission sample (following Art 6.4) may contribute of up to 20% of the size of national samples. The size of the sample shall be determined by applying the Bethel algorithm (Bethel, 1989)[8].

Part B: methodology for determining or estimating the values of soil descriptors

Soil descriptor	**Reference methodology**	**Minimum methodological criteria**	**Validated transfer function required (if using a methodology different from the reference methodology[9])?**
Soil texture (clay, silt and sand content – needed for the determination of other descriptors and related ranges)	ISO 11277:1998 Determination of particle size distribution in mineral soil material - Method by sieving and sedimentation ISO13320:2009 Particle size analysis - Laser diffraction methods		YES

[8] Bethel, J. 1989. "Sample Allocation in Multivariate Surveys." Survey Methodology 15: 47–57.

[9] The description of the methodologies different from the reference methodology shall either be available in the scientific literature or publicly available.

Electrical Conductivity	ISO 11265:1994 Determination of The Specific Electrical Conductivity		YES
Soil erosion rate		Soil erosion rate estimation shall take into account all actions taken to mitigate or compensate the erosion risk, including post-fire mitigation measures. Soil erosion rate estimation shall include all relevant erosion processes such as erosion by water, by wind, harvest and tillage erosion. Soil erosion by water shall be assessed by considering the following factors: - soil characteristics (e.g. erodibility, soil crusting, soil roughness), - climate (e.g. rainfall erosivity - intensity and duration, considering relevant climate change projections for a given area), - topography (e.g. slope steepness and length), - vegetation cover, crop type, land use and management practices to control or reduce erosion - burned areas. Soil erosion by wind shall be assessed by considering the following factors: - soil characteristics (e.g. erodibility), - climate (e.g. soil moisture, wind speed, evaporation), - vegetation (e.g. crop type) and - management practices to control or reduce erosion (e.g. wind breaks).	N/A

Soil Organic Carbon (SOC)	ISO 10694:1995 Determination of organic and total carbon after dry combustion		YES
Bulk density in subsoil (B horizon[10]) or equivalent[11] parameter chosen by Member States	Option 1: LABORATORY: ISO 11272 for determination of dry bulk density Option 2: ESTIMATION: pedotransfer functions based on soil organic carbon and texture following the methodology described in the scientific article "Empirically-derived pedotransfer functions for predicting bulk density in European soils"[12] In case an equivalent parameter is chosen, the methodology shall be either a European or International standard when available; when not available, the methodology chosen shall either be available in the scientific literature or publicly available.		YES
Extractable phosphorus	ISO 11263:1994 for spectrometric determination of phosphorus soluble in sodium hydrogen carbonate solution (P-Olsen)		YES
- concentration of heavy metals in soil: As, Sb, Cd, Co, Cr (total), Cr (VI), Cu, Hg, Pb, Ni, Tl, V, Zn - concentration of a selection of organic contaminants	Potential environmental available content of heavy metals in soils based on **ISO 1756:2016** using dilute nitric acid	Use European or International standards when available; when not available, the description of	YES

[10] As defined in the FAO Guidelines for Soil Description, Chapter 5 (https://www.fao.org/3/a0541e/a0541e.pdf)

[11] Equivalent according to the EEA report: Soil monitoring in Europe – Indicators and thresholds for soil health assessments — European Environment Agency (europa.eu)

[12] https://doi.org/10.1111/j.1365-2389.2011.01412.x

defined by Member States and taking into account existing EU legislation (e.g. on water quality or pesticides)		the methodology chosen shall either be available in the scientific literature or publicly available	N/A
Soil water holding capacity	Methodology to determine the value for one sample point: Option 1: LABORATORY: ISO 11274:2019 for determination of the water-retention characteristic. Option 2: ESTIMATION: apply methodology described in the scientific article "New generation of hydraulic pedotransfer functions for Europe"[13] based on texture (or particle size distribution) and soil organic carbon.	Minimum criteria for estimating the total soil water holding capacity of a soil district on a river basin or sub-basin scale: - for the area of land not taken estimate the total value of soil water holding capacity - for the area of land taken, consider setting the water holding capacity of impervious areas to zero, attributing proportionately intermediate values to semi-impervious and other artificial areas.	YES (for point value)
Nitrogen in soil	ISO 11261:1995 for determination of total soil nitrogen using a modified Kjeldahl method		YES
pH	ISO 10390:2005 for determination of pH in H2O and CaCl2 extract (pH-H2O and pH-CaCl2)		YES
Bulk density in "topsoil" (A-horizon[14])	Option 1: LABORATORY: ISO 11272 for determination of dry bulk density Option 2: ESTIMATION: pedotransfer functions based on soil organic carbon and texture following the methodology described in the scientific article "Empirically-derived pedotransfer functions for		YES

[13] https://doi.org/10.1111/ejss.12192

[14] As defined in the FAO Guidelines for Soil Description, Chapter 5 (https://www.fao.org/3/a0541e/a0541e.pdf)

	predicting bulk density in European soils"[15]		
Potential soil basal respiration Additionally, Member States may select soil biodiversity descriptors such as: -Metabarcoding[16] of bacteria, fungi and animals; - Abundance and diversity of nematodes; - Microbial biomass; - Abundance and diversity of earthworms (in cropland)	Follow indications described in the scientific article "Microbial biomass and activities in soil as affected by frozen and cold storage"[17]	Use European or international standards when available; when not available, ensure the description of the methodology used is publicly available; when not available, the description of the methodology chosen shall either be available in the scientific literature or publicly available	YES For other soil biodiversity descriptors: N/A

Part C: minimum methodological criteria for determining the values of land take and soil sealing indicators

- The description of the methodologies chosen shall either be available in the scientific literature or publicly available.

15 https://doi.org/10.1111/j.1365-2389.2011.01412.x

16 Sequencing of DNA barcodes for measuring taxonomical and functional diversity of archaea, bacteria, fungi and other eukaryotes as done for LUCAS Soil Biodiversity based on https://doi.org/10.1111/ejss.13299

17 https://www.sciencedirect.com/science/article/abs/pii/S0038071797001259

ANNEX III

SUSTAINABLE SOIL MANAGEMENT PRINCIPLES

The following principles shall apply:

a. Avoid leaving soil bare by establishing and maintaining vegetative soil cover, especially during environmentally sensitive periods;

b. Minimise physical soil disturbance;

c. Avoid inputs or release of substances into soil that may harm human health or the environment, or degrade soil health;

d. Ensure that machinery use is adapted to the strength of the soil, and that the number and frequency of operations on soils are limited so that they do not compromise the physical soil health;

e. When fertilization is applied, ensure adaptation to the needs of the plant at the given location and in the given period, and the condition of soil and prioritize circular solutions that enrich the organic content;

f. In case of irrigation, maximise efficiency of irrigation system and management and ensure that when recycled wastewater is used, water quality meets the requirements of Regulation (EU) 2020/741 of the European Parliament and of the Council[18] and if irrigation water from other sources is used, it does not degrade soil health;

g. Ensure soil protection by the creation and maintenance of adequate landscape features at the landscape level;[19]

h. Use site-adapted species in the cultivation of crops, plants or trees where this can prevent soil degradations or contribute to improving soil health, also taking into consideration the adaptation to climate change;

i. Ensure optimised water levels in organic soils so that the structure and composition of these soils is not negatively affected;[20]

j. In the case of crop cultivation, ensure crop rotation and crop diversity, taking into consideration, different crop families, root systems and water and nutrient requirements;

k. Adapt livestock movement and grazing time, taking into consideration animal types and stocking density, so that soil health is not compromised and the soil's capacity to provide forage is not exceeded;

l. In case of land use change, avoid substantial losses in soil capacity to provide ecosystem services;

m. In case of known disproportionate loss of one or several functions that substantially reduce the soils capacity to provide ecosystem services, apply targeted measures to regenerate these soils functions.

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18 Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse (OJ L 177, 5.6.2020, p. 32).

19 This principle does not apply to forest soils

20 This principle does not apply to urban soils

ANNEX IV

PROGRAMMES, PLANS AND MEASURES REFERRED TO IN ARTICLE 10

(a) the national restoration plans prepared in accordance with Regulation [*OP : please insert Reference of Regulation on nature restoration when adopted]* of the European parliament and of the Council;

(b) the strategic plans to be drawn up by Member States under the Common Agricultural Policy in accordance with Regulation (EU) 2021/2115;

(c) the Code of Good Agricultural Practice and the action programmes for designated vulnerable zones adopted in accordance with Directive 91/676/EEC;

(d) the conservation measures and prioritized action framework established for Natura 2000 sites in accordance with Directive 92/43/EEC;

(e) the measures for achieving good ecological and chemical status of surface water bodies and good chemical and quantitative status of groundwater bodies included in river basin management plans prepared in accordance with Directive 2000/60/EC;

(f) the flood risk management measures included in the flood risk management plans prepared in accordance with Directive 2007/60/EC;

(g) the drought management plans referred to in the Union Strategy on Adaptation to Climate Change;

(h) the national action programmes established in accordance with the United Nations Convention to Combat Desertification;

(i) the information on LULUCF actions in accordance with Decision 529/2013/EU;

(j) the national air pollution control programmes prepared under Directive (EU) 2016/2284 and monitoring data about air pollution impacts on ecosystems reported under the same directive;

(k) the integrated national energy and climate plan in accordance with Regulation (EU) 2018/1999;

(l) the risk assessments and the assessments of the risk management capabilities developed in accordance with Decision No 1313/2013/EU;

(m) the national actions plans in accordance with Directive 2009/128/EC.

ANNEX V

INDICATIVE LIST OF RISK REDUCTION MEASURES

The following is a non-exhaustive list of risk reduction measures which Member States may choose to apply on contaminated sites.

In addition to this list, risk reduction measures may also include best available techniques referred to in Directive 2010/75/EU and measures taken by the competent authorities and industrial operators following a major accident, in accordance with Directive 2012/18/EU.

(1) Remediation techniques for in- or ex-situ (after excavation) remediation

(a) Physical remediation techniques

- Vapor extraction, air sparging;
- Heat treatment, steam injection, thermal desorption, vitrification;
- Soil washing and flushing;
- Electrokinetic extraction;
- Liquid layer removal;
- Surface capping, reactive barriers, encapsulation.

(b) Biological remediation techniques

- Stimulation of aerobic or anaerobic degradation: bioremediation, biostimulation, bioaugmentation, bioventing, biosparging, compost application;
- Phytoextraction, phytovolatilization, phytodegradation, phytostabilisation;
- Composting, landfarming, and bioreactor systems;
- Biofiltration, biotreatment wetlands, and biobeds;
- Natural attenuation.

(c) Chemical remediation techniques

- Chemical oxidation, stabilization, immobilization, solidification;
- Chemical reduction and reduction-oxidation (redox) reactions;
- Pump and treat of groundwater.

(2) Risk reduction measures other than remediation

- Restriction on the cultivation and consumption of crops and vegetables;
- Restriction on the consumption of eggs;
- Restriction on the access of pets or husbandry;
- Restriction on the extraction or use of groundwater for drinking, personal hygiene or industrial purposes;
- Restriction on the demolition, de-sealing, or construction on the site;
- Restriction on the access on or in the neighbourhood of the site (e.g. through fencing);
- Restriction on land use or land use changes;
- Restriction on digging, drilling or excavation;
- Avoid contact with the soil and apply precautions to protect human health (e.g. respirators, gloves, etc.);
- Avoid dust, air indoor spaces and promote regular wet cleaning

ANNEX VI

PHASES AND REQUIREMENTS FOR SITE-SPECIFIC RISK ASSESSMENT

The site-specific assessment of the risks for human health and the environment from contaminated sites typically follows the following phases:

1. Characterization of the contamination requires identifying the contaminants present at the site and determining their source, concentration, chemical form, and distribution in the soil and groundwater. The presence and concentration of contaminants is determined through soil sampling and investigation.

2. Exposure assessment identifies the path by which soil contaminants may reach receptors. Exposure pathways may include inhalation, ingestion, dermal contact, plant uptake, migration to groundwater or others. This information is combined with the frequency and duration of exposure and receptor characteristics such as age, gender, and health status to estimate the contaminant uptake. The source-pathway-receptor linkages are summarized in a graphic, schematic and simplified representation: the conceptual site model.

3. Toxicity or hazard assessment involves the evaluation of the potential health and environmental effects of the contaminants, based on the dose and duration of exposure. The toxicology or hazard assessment takes into account the inherent toxicity of the contaminants and the susceptibility of different populations, such as animals, micro-organisms, plants, children, pregnant women, elderly, etc. The toxicological information is used to estimate reference doses or concentrations, which are used for the risk characterization.

4. Risk characterization requires integrating the information from the previous steps to estimate the magnitude and probability of adverse effects of the contaminated site for human health and the environment. The risk characterization helps to prioritize the need for risk reduction and remediation measures. It can also help to define remediation or management objectives for a site, e.g. to achieve maximum acceptable limits or site-specific risk-based screening values.

ANNEX VII

CONTENT OF REGISTER OF POTENTIALLY CONTAMINATED SITES AND CONTAMINATED SITES

The design and presentation of the data in the register shall enable the public to track progress in the management of potentially contaminated sites and contaminated sites. The register shall contain and present the following information at site level for the known potentially contaminated sites, contaminated sites, contaminated sites requiring further action, and contaminated sites where action was taken or is being taken:

- Geographic coordinates, address or cadastral parcel(s) of the site;
- Year of inclusion in the register;
- Contaminating or potentially contaminating risk activities that have taken or are taking place on the site;
- Management status of the site (potentially contaminated site, contaminated site, contaminated site requiring further action, or contaminated site where action was or is being taken);
- Conclusion on the presence or absence, concentration, type and risk of the contamination (or residual contamination after remediation) when already available from the soil investigations and risk assessment respectively referred to in Article 17 and 18;
- Next actions and management steps required and referred to in Articles 17 and 18 including their timeline.

In addition, the register may contain the following information where available:

- Information on environmental permits approved for the site (e.g. starting and end year of the activity);
- Current and planned land use;
- Results of soil investigation and remediation reports such as concentrations and contours of the contamination, conceptual site model, risk assessment methodology, techniques used or planned, effectiveness and cost estimates of risk reduction measures.