

A large, open-pit quarry is shown in the background, illustrating the subject matter. The quarry walls are exposed, showing layers of earth and rock. A small white dump truck is visible on the left side of the quarry floor. In the distance, a dense forest of green and autumn-colored trees covers rolling hills under a blue sky with white clouds.

Guidance document on Non-energy mineral extraction and Natura 2000

A summary

Environment



All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at:

https://europa.eu/european-union/contact_en

Freephone: 00 800 67 89 10 11 (certain operators may charge for these calls).

Email via: https://europa.eu/european-union/contact_en

Information about the European Union in all the official languages of the EU is available on the Europa website at:
https://europa.eu/european-union/index_en

You can download or order free and priced EU publications from:

<https://publications.europa.eu/en/publications>

Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

Luxembourg: Publications Office of the European Union, 2019

© European Union, 2019

Reuse is authorised provided the source is acknowledged. The reuse policy of European Commission documents is regulated by Decision 2011/833/EU (OJ L 330, 14.12.2011, p. 39). For any use or reproduction of photos or other material that is not under the EU copyright, permission must be sought directly from the copyright holders.

ISBN: 978-92-79-99542-2

doi:10.2779/985239

KH-02-19-072-EN-N

About this leaflet

The Non-Energy Extractive Industry (NEEI) provides many of the basic raw materials for Europe's manufacturing and construction industries. Individual NEEI plans and projects can however come into conflict with nature conservation and in particular with the EU Habitats and Birds Directives.

This leaflet represents a summary of the "Non-energy mineral extraction and Natura 2000" guide, designed to provide guidance on how best to ensure that NEEI developments are compatible with the provisions of the two EU Directives. It focuses in particular on the procedures to follow under Article 6 of the Habitats directive and provides clarifications on certain key aspects of this approval process in the context of NEEI developments in particular.

The guide is addressed to competent authorities and developers, as well as consultants, Natura 2000 site managers and other practitioners involved in the planning, design, implementation or approval of mineral plans or NEEI projects. It can be of interest also for NGOs, international bodies, and the general public.

PHOTO CREDITS

cover: Limestone quarry, Luxembourg / Pxhere

page 3: Sea salt, Mallorca / Pxhere

page 4: Lake in a past bauxite quarry / Palickap

page 5: Quarry, aerial view / Pxhere

page 6: Barrois quarry today SCI / J.M. Pascolo

page 8: Machinery for mining / Pxhere

page 10: Abandoned mine / Pxhere

The non-energy extractive industry in the EU

The European NEEI sector is often divided into three main sub-sectors depending on the physical and chemical characteristics of the minerals concerned and, in particular, on their uses and on the downstream industries they supply:

- **"construction" minerals**, usually including aggregates in a range of particle sizes such as sand, gravel and various types of crushed rocks (e.g. chalk, limestone, sandstone), natural rock materials (such as marble and granite) plus a range of clays, gypsum and shale
- **"industrial" minerals** covering physical minerals (e.g. bentonite, borates, calcium carbonates, diatomite) or chemical minerals (e.g. salt, potash, sulphur) and
- **"metallic" minerals**, covering a wide range of ores which, following processing, yield metals or metallic substances such as aluminium, chromium, copper, gold, lithium, manganese.

The extraction of construction minerals and aggregates, in particular, represents the largest sub-sector of the NEEI industry with the EU in terms of value and volume.

Securing reliable and undistorted access to raw materials is an increasingly important factor for the EU's economic competitiveness. Recognising this, the European Commission

adopted, in November 2008, a Raw Materials Initiative, which sets out targeted measures to secure and improve access to raw materials for the EU.

The Raw Materials Initiative is based on three pillars: ensuring access to raw materials from international markets under the same conditions as other industrial competitors, setting the right framework conditions within the EU in order to foster a sustainable supply from European sources and boosting overall resource efficiency and promoting recycling in order to reduce the EU's consumption.

The second pillar represents a real challenge as the industry can only operate where the minerals are present and therefore cannot seek to operate only in areas where there would be no conflict with other land uses, the general public or areas of conservation, landscape or visual importance.

The need for access to particular parcels of land means that, whilst the amount of land required for non-energy extraction is relatively small in absolute terms (less than 1% of the EU territory), individual development projects may nevertheless come into conflict with competing land uses or broader societal interests, or they may have an unacceptably high environmental impact.



The EU policy framework

Like all other land users, the non-energy mineral extraction industry must operate within the framework of EU environmental laws, which include both the **Habitats and Birds Directives**. The EU 'Habitats' and 'Birds' Directives are the cornerstones of the EU's biodiversity policy. They enable all Member States to work together to protect and ensure the survival of Europe's most endangered and vulnerable species and habitat types.

The Directives have two main objectives:

- they protect species in their own right across the EU (through species protection provisions);
- they conserve certain rare and endangered habitat types or the core habitats of certain rare and endangered species in order to ensure their continued survival (through site protection provisions leading to the establishment of the Natura 2000 Network).

The Natura 2000 network includes currently more than 27,500 sites covering around 18% of the EU territory and more than 9% of its surrounding seas. It is not a system of strict protection reserves where all human activities are excluded. The Nature Directives provide a common legislative framework for all EU countries which ensures that human activities - *inter alia* NEEI activities - are undertaken in a way that does not adversely affect the integrity of Natura 2000 sites.

Article 6 of the Habitats Directive lays down the procedure to be followed for authorising plans and projects that are likely to have a significant effect on a Natura 2000 site. In essence, it requires that a plan or project likely to have a significant effect on a Natura 2000 sites undergoes an "**Appropriate Assessment**" (AA) to study these effects in detail and to see how they relate to the site's conservation objectives.



NEEI plans and projects may also be subject to the provisions of the Strategic Environmental Assessment (SEA) and the Environmental Impact Assessment (EIA) Directives.

The purpose of the **SEA Directive** is to ensure that the environmental consequences of certain plans and programmes are identified, assessed and taken into account during their preparation and before their adoption. If this is done, it usually allows for a more appropriate siting of future developments away from areas of potential conflict with nature conservation.

The **EIA Directive** operates at the level of individual public and private projects. A development consent for projects that are likely to have significant effects on the environment should be granted only after an EIA has been made and its findings are taken into account.

There are many similarities between the procedures for SEA or EIA and the Appropriate Assessment and their streamlining is therefore recommended. But there are also some important distinctions, so a SEA and or EIA cannot replace an AA as neither procedure overrides the other. One of the key distinctions, apart from the fact that the AA has a specific focus on the conservation

objectives of the Natura 2000 site is how binding is the outcome of the AA. Contrary to the SEA and EIA, if the AA cannot ascertain that the plan or project (including any necessary mitigation measures) will not adversely affect the integrity of a Natura 2000 site, the authority cannot agree to it (unless specific conditions apply, i.e. there are no less damaging alternative solutions, imperative reasons of overriding public interest are invoked, and compensation measure are established). The SEAs/ EIAs on the other hand are designed to make the planning authorities fully aware of the environmental implications of the proposed plan or project so that these are taken into account in their final decision.

Other EU environmental laws and policies that are of relevance to the NEEI activities include:

- Directive on the management of waste from extractive industries (2006/21/EC).
- Environmental Liability Directive (2004/35/EC).
- Water Framework Directive (2000/60/EC) and Groundwater Directive (2006/118/EC).
- Marine Strategy Framework Directive (2008/56/EC).
- EU Strategy on Sustainable Use of Natural Resources.
- The precautionary principle.



Potential impacts of NEEI on nature

By its very nature, the extraction of minerals invariably has an impact, frequently negative, on the land upon which it operates. But there are also a growing number of examples of where an extraction site has, over the course of its entire life cycle, delivered an overall net benefit for biodiversity. This is because more and more quarries, pits and mines are being rehabilitated at the end of their life, with biodiversity in mind. Where this occurs in an already impoverished natural environment, such rehabilitated sites have the potential to make a significant positive contribution to biodiversity by providing new habitats for wildlife.

When assessing the potential impacts of extraction activities on nature and wildlife it is important to bear in mind that these impacts may concern not just the extraction site itself, but also all associated installations such as access roads, conveyer belts, crushers, storage sites, spoil tips, lagoons and tailing ponds etc. They also concern all phases of the development proposal from the initial exploration and actual operation of the site (including site rotation/expansion) to its eventual closure and rehabilitation.

The type and degree of environmental impacts vary considerably from one site to another depending on a range of factors. Therefore they must be determined on a case by case basis.

Cumulative effects need also to be considered, as they may arise when several extraction sites are present within a given area, or as a result of combined impacts of extraction activities and other types of development (e.g. other infrastructure or industrial developments). So even if an individual extraction project may not be considered to have an adverse effect on a Natura 2000 site, project developers must nevertheless also consider the potential cumulative effects of this project in combination with other plans and projects in the area.

The potential effects of extractive activities on species and habitat types of Community interest include:

- **habitat loss and degradation:** the NEEI sector's primary impact on biodiversity is often through land clearance and the removal of surface features during the extraction of minerals or the building of associated infrastructures such as access roads, dumping sites



The importance of strategic planning

and tailings ponds. Through this process, existing habitats may be altered, damaged, fragmented or locally removed

- **species disturbance and displacement:** the NEEI extraction process may also cause significant disturbance to certain plants or animals. The impact may be temporary or permanent, direct or indirect, on-site or off-site and may come into play at different times during the project cycle. Animals can be disturbed by a range of factors such as noise, dust, pollution, human presence, regular movements (e.g. transportation of goods), etc. This may affect the species ability to breed, feed, rest or disperse and migrate.

The impacts of extraction activities on biodiversity can be caused by a number of factors, including:

- **land clearance:** land is often cleared to gain access to the minerals and to make space for all associated infrastructures including stock piling or dump sites, tailings ponds and physical structures such as conveyor belts, processing plants etc.
- **hydraulic disruptions** (alteration of hydrology/hydrogeology conditions): if de-watering of the ore-body or any other extraction site is required, extractive activities can potentially modify hydrological conditions in the extraction areas and in its surroundings, with consequent changes in the drainage network caused by a temporary imbalance in surface runoff, infiltration etc. In such cases, this could lead to impacts on nearby or distant springs and wetlands, both in terms of quantity and quality
- **changes in water quality:** some mineral extraction and production processes can cause pollution as well as other changes in water quality, which could either directly affect the aquatic habitats and species present in the site and/or indirectly affect other sites that are vulnerable to this type of change
- **habitat changes** that may promote invasive species colonization: ecological changes caused by mines and quarries may favour colonisation by pioneer species, some of which can become invasive
- **other factors** include noise and vibrations, movement-related disturbances, dust.

Strategic level spatial planning is a tool used by public authorities to help them establish a coherent sustainable development policy for their territory. It is one of the most effective means of identifying potential conflicts and minimising the impacts on nature and wildlife early on in the planning process. It not only leads to a more integrated, transparent and stable development framework for industry, but also reduces the risk of difficulties or delays for individual projects.

It is best done in consultation with all stakeholders and interest groups so that viable alternatives are explored.

In the case of the NEEI industry, detailed mineral maps are essential in identifying which types of minerals are located where and whether these are considered exploitable or not from a commercial perspective. Overlaying these mineral resources maps on Natura 2000 maps showing the location and boundaries of Natura 2000 sites can help to quickly identify areas where there is no or a low risk of potential conflicts and those where there is a higher risk. The detailed investigation of potential conflict areas can be done either by the industry itself as part of its own forward looking strategy or through the public authorities' mineral plan or spatial development/land-use plans. These can then be investigated further through SEA, EIA and AA.

Carrying out an appropriate assessment

Both plans (e.g. mineral plans) and individual projects may be subject to an Appropriate Assessment under Article 6(3) of the Habitats Directive.

The AA should consider the effect on the integrity of the Natura 2000 sites of the mineral plan/extractive project, alone and in combination with other plans or projects. This procedure is designed to:

- fully assess the impacts of plans or projects that are likely to have a significant effect on a Natura 2000 site;
- ascertain whether an adverse effect on the integrity of the site can be ruled out. If such is not the case, the plan or project can only be approved if mitigation measures or planning conditions can be introduced that remove or minimise the adverse effects on the site;

- provide a mechanism for approving, in exceptional circumstances, plans or projects for which it cannot be ascertained that they will not adversely affect a Natura 2000 site even after the introduction of mitigation measures, when these plans or projects, in the absence of alternative solutions, are judged to be of overriding public interest.

It lies with the competent national authorities, in the light of the conclusions of the AA, to approve the plan or project. Where reasonable scientific doubt remains as to the absence of adverse effects on the integrity of the site linked to the plan or project being considered, the competent authority will have to refuse authorisation and/or require incorporation of further mitigation measures such that the reasonable scientific doubt is removed.



Rehabilitation and biodiversity offset

If, on the basis of the AA, it cannot be ascertained that a plan or project will not adversely affect the integrity of the site concerned, the provisions of Art. 6(4) of the Habitats Directive apply to any subsequent decisions which are taken to continue with the project as proposed and establish a set of conditions which must be met for the competent authority to authorise it. It falls on whoever wants to make use of Article 6(4) to prove, as a prerequisite, that the conditions are met. These are as follows:

- the alternative put forward for approval is the least damaging for the integrity of the Natura 2000 site in terms of its qualifying interests, and no other feasible alternative exists that would not adversely affect the integrity of any Natura 2000 site;
- there are imperative reasons of overriding public interest concerning human health and public safety or overriding beneficial consequences for the environment, or, for other imperative reasons if, before granting approval to the plan or project, the opinion of the Commission has been given;
- all necessary compensatory measures have been adopted to ensure that the overall coherence of Natura 2000 is protected.

Compensatory measures should:

- contribute to the conservation of natural habitats and species of Community Interest within the biogeographical region concerned, or within the same range, migration route or wintering area for bird species (i.e. in case of sites designated under the Birds Directive) in the Member State concerned;
- address, in comparable proportions, the habitats and species of Community Interest negatively affected;
- provide functions comparable to those which had justified the selection of the original site, particularly regarding the adequate geographical distribution.

NEEI are making important efforts not only to reduce their impacts but also to contribute to biodiversity conservation, in particular through the rehabilitation of extraction sites and the implementation of biodiversity offsets.

Rehabilitation is the process of converting derelict land to usable land and may include engineering as well as ecological solutions. The rehabilitation plan is normally an integral part of the NEEI project and part of the permit conditions; if properly planned and implemented, it can contribute to mitigation or compensation of adverse effects.

The main criterion for rehabilitation to fulfil the requirements of a mitigation measure under Art.6.3 is that, at all times, it must be demonstrated that the integrity of the site is maintained. In particular:

- the rehabilitation measure has to address the habitats and/or species negatively affected (i.e. restoration of the same habitat type/species);
- the rehabilitation measure has to target the affected area;
- the rehabilitation must result in a significant reduction of the negative effects, in duration, extent and intensity. This reduction must be achieved in short time during extraction.

Biodiversity offsets represent a practice often used by the NEEI to compensate for unavoidable impacts on biodiversity resulting from their activities. They may include habitat creation, restoration or enhancement, and also purchasing an area of equivalent habitat for longer-term protection. In some cases translocations of species or plant communities may be undertaken. Offsets could offer some opportunity to provide compensation within the meaning of Article 6(4) of the Habitats Directive, when all the requisites set out in that Article are met.

NEEI in marine Natura 2000 areas

Aggregates' extraction in marine areas is becoming more and more important. Sand and gravel constitute most of the minerals dredged from the sea, but there are also other minerals, such as stone shell and metalliferous minerals.

Maritime spatial planning is a key instrument to optimise the use of marine space to benefit economic development and the marine environment. Adopting a zoned approach may provide the option of introducing marine aggregate extraction to an existing multi-use environment in a strategic manner, through the identification of areas where dredging is likely to be more appropriate or acceptable.

Aggregates' extraction may have potential impacts on marine environment, such as for example removal of benthos, increased turbidity of water, changes in sediment composition, changes in hydrodynamics/sediment transport, etc. The significance and extent of the effects will depend upon a range of factors including the location of the extraction area, the nature of the surface and underlying sediment, coastal processes, the design, method, rate, amount and intensity of extraction, and the sensitivity of habitats and species present in the Natura 2000 area.

The most significant effect of dredging is the lowering of seabed levels and the removal of seabed sediments, which causes a temporal alteration of seabed topography, sediment composition and structure, which in turn cause the destruction of the benthic biota. Studies have reported losses of 30-80% of the species diversity, population density and biomass of benthic invertebrates in dredged areas, the magnitude of the loss depending on the intensity of dredging over the area as a whole. These losses are not strictly confined to the dredged area itself, as the plumes generated by the dredging operations may extend a considerable distance beyond the worked area. Therefore some extractions outside marine Natura 2000 sites can have indirect effects on them.

Certain species may be particularly vulnerable if aggregate extraction activities coincide with areas where they breed or spawn. The prime risk of plume sediment deposition is smothering of fish eggs on spawning grounds, such as those of herring and sand eel. The consequences of the deterioration of the benthic communities have also to be considered in relation to food chains which are critical for protected species. For example sand eels are a key factor in marine food webs and of particular importance to seabirds and marine mammals.



Examples of mitigation measures in marine aggregate extraction

The dredging intensity period is limited to a specific number of hours per surface unit (ha).

In order to protect bird species that are sensitive to disturbances, no dredging activities are undertaken during certain months of the year.

No dredging activities are undertaken during the reproduction and nursery period of marine mammals, which are extremely sensitive to disturbances.

No-use buffer zones of sufficient size are established around special sensitive areas.

To minimize the area of the seabed dredged and thus the environmental footprint, the working areas are relatively small. In each concession a limited number of working areas are allowed. Only when one working area is completed can a new one be opened. A return to former dredged areas is not allowed in order to provide an optimal setting for natural regeneration.

The dredging depth of the sediment is limited.

To reduce the plume, the dredger channels the overflow underneath the bottom of the vessel into the sea.

Key recommendations

To support an overall effective and efficient process of assessment and implementation of NEEI activities:

the establishment of a monitoring plan to check the efficacy of prevention, mitigation, and, if necessary, compensatory measures.

the cooperation between competent authorities and proponents to discuss constraints and find the most appropriate solutions on a case by case basis.

an early and regular consultation between competent authorities, project developers and relevant stakeholders.

the consideration of existing provisions for the protection of species under the Birds and Habitats Directives.

Case studies

SPA designated in a quarry

The SPA Dubnické štrkovisko is located in an area where industrial gravel excavation was carried out in the Vah River (Slovakia). Thanks to incomplete excavation (i.e. leaving small islands) a natural site was created. Once the extractive activity was stopped, there was a rapid natural succession that led to the creation of a high quality area for wild birds. In Slovakia, this site (ca. 60 ha) is one of the three best nesting habitats of *Sterna hirundo*, a Birds Directive species depending on regular management of nature succession that, in this case, is carried out by both the State and non-governmental organisations. Six other nesting bird species can be found in the site, including *Ixobrychus minutus* and *Porzana porzana*.

The ancient quarry is also used for migratory species and for wintering. The site keeps its ecological character despite the fact that it is part of an authorised mining area and is located in a strongly man modified area, close to a town and a highway.

Ministry of Environment, Slovakia, 2008.

Good practices for marine aggregate dredging

Marine aggregates play an important part in the provision of high quality raw materials for both the UK construction industry and for coastal protection. The dredge areas are licensed for The Crown Estate following an extensive Environmental Impact Assessment (EIA) and stakeholder consultation process formerly regulated through Communities & Local Government (CLG) and the Department for Environment, Food and Rural Affairs (Defra) and now through the Marine and Fisheries Agency (MFA), an executive agency of Defra.

In 2002 the Government provided an additional source of funding by the imposition of a levy on primary aggregates from both land-won and marine sources. This Aggregate Levy Sustainability Fund (ALSF) has four main objectives:

- Minimising demand for primary aggregates
- Promoting environmentally friendly extraction & transport
- Addressing the environmental impacts of past aggregates extraction
- Compensating local communities for the impacts of aggregates extraction.

Marine aggregate extraction: Helping to determine good practice. Conference proceedings: September 2006. Editors: Newell and Garner.

Guidelines for mineral planning in England

Minerals Policy Statements set out the national minerals planning policies in England. Specific objectives are provided for different types of materials (aggregates, brick clay, natural building and roofing stone, oil and gas).

Where minerals development is proposed within, adjacent to, or where it is likely to significantly affect a Natura 2000 site, specific Planning Policy Statements and guidelines must be taken into account. These set out clear rules and conditions for the development of activities planned. The roles and responsibilities of the planning authority, the project developer and Natural England are identified.

The contents of an AA, the options for public consultation, the assessment of alternative solutions, the consideration of imperative reasons of overriding public interest and the conditions for the implementation of compensatory measures are covered in these guidelines.

National planning policy outlines how individual Mineral Planning Authorities (MPA) should undertake their mineral planning. Each MPA produces a Mineral Development Framework (MDF), which should:

- indicate the location of sites important for biodiversity, distinguishing between the hierarchy of international, national, regional, and locally designated sites; and
- identify any areas or sites for the restoration or creation of new priority habitats which contribute to regional targets.

<http://www.communities.gov.uk/publications/planningandbuilding/mineralspolicystatement5>

Mitigation measures for flying squirrels

A gold mine in southwestern Finland, including both open pit and underground mine, was designed and permitted. According to the naturalistic study carried out in addition to environmental impact assessment, 1- 3 male of flying squirrel (*Pteromys volans*), the most important mammal in the area protected under the Habitats Directive, and three breeding female live in the area. Each territory was studied in detail, also considering the possible connections between them and with other flying squirrel areas outside the mining site. The nearest Natura 2000 area was situated 5 km from the mine.

The applicant complemented its application concerning protection of flying squirrel after having consulted with the regional environmental authorities and the permit conditions included, among others, the following prescriptions:

- The edge of the open pit can extend at most to 40 m distance from the nearest nesting tree. Between the nesting tree and the pit the wood must not be logged except for 5 meters area between the pit edge and the wood, where cuttings may be allowed for mine safety reasons. Thus, a 40 m wide zone of forest would be preserved between the nesting tree in territory 1 and the edge of open pit.
- The breeding and nourishment trees in the flying squirrel territories in the area shall not be destroyed and sufficient shelter wood shall be preserved around the nesting trees in the territories. Wood shall not be cut from the routes of the flying squirrel within the mining area.

Euromines (Polar Mining Oy, Vammala, Finland).

For further reading

This publication represents a summary of the EC Guidance Document on "Non-energy mineral extraction and Natura 2000": http://ec.europa.eu/environment/nature/natura2000/management/docs/neei_n2000_guidance.pdf

The Commission has produced guidance documents to help people understand and apply the appropriate assessment procedure. They are available at the Commission's Natura 2000 website: http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC
http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art_.._nov_2018_endocx.pdf

The Habitats Directive: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043>

The Birds Directive: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147>

Overview on the main provisions of the Water and Marine Strategy Frameworks Directives, Birds, Habitats and Floods Directives: <https://publications.europa.eu/en/publication-detail/-/publication/cce60733-c81e-11e6-a6db-01aa75ed71a1>

Natura 2000 viewer: <http://natura2000.eea.europa.eu/>



Publications Office