EUROPEAN COMMISSION
DIRECTORATE-GENERAL
ENVIRONMENT
Directorate B - Circular Economy & Green Growth
Unit B3- Waste Management & Secondary Materials

Study supporting the elaboration of guidelines for best risk management approaches in the extractive sector

Technical Specifications

1. TECHNICAL SPECIFICATIONS

1.1.Background

The EU is dependent on the import of many raw materials that are necessary for value chains of strategic importance such as connected, clean and autonomous vehicles, smart health, low-carbon industry and hydrogen technologies. In order to improve the security of supply of raw material, the Commission adopted the raw materials initiative[1] in 2008. This initiative sets out a strategy for tackling the issue of access to raw materials in the EU. It aims to ensure the fair and sustainable supply of raw materials from global markets, the sustainable supply of raw materials within the EU as well as resource efficiency and supply of secondary raw materials through recycling. The Raw Materials Initiative is constantly updated with a list of critical raw materials. The most recent list of 2017 identifies 27 raw materials of high economic importance and at a risk of supply for the EU.

The Communication "Closing the loop - An EU action plan for the Circular Economy"[2] describes the 'circular economy' as an economy where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised. Directive 2006/21/EC[3] on the management of wastes from extractive industries requires Member States to ensure, inter alia, that operators prevent or reduce waste production and its harmfulness by considering waste management in the design phase and in the choice of the methods used for mineral extraction and treatment. The extractive sector contributes to the circular economy objectives not only by providing primary raw materials where necessary but also by increasing its resource efficiency and by providing secondary raw materials as demonstrated in the circular economy action plan[4] [5].

General and environmental legislation of the EU such as the directives on environmental impact assessment, water and habitats protection apply to the extraction of raw materials. Following a series of mining accidents, the EU adopted the Extractive Waste Directive in 2006. This Directive provides measures to prevent or reduce as far as possible any adverse effects on the environment and any resulting risk for human health that may result from the management of waste from the extractive industries. These measures shall be based, inter alia, on the best available techniques (BAT) without prescribing the use of any technique or specific technology, but taking into account the technical characteristics of the waste facility, its geographical location and the local environmental conditions. The European Commission has organised an exchange of information between experts from EU Member States, industries concerned, non-governmental organisations promoting environmental protection and the Commission in order to identify BAT. On 18 December 2018 the Commission

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52008DC0699
[2] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614
[3] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0021-20090807
[4] https://publications.europa.eu/en/publication-detail/-/publication/f18472f8-36aa-11e9-8d04-01aa75ed71a1/language-en/format-PDF/source-87989698,
[5] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC116131/20190506-d3-jrc-science-for-policy-recovery_of_rm_from_mining_waste_and_landfills_6_05_19_online.pdf

published the BAT Reference Document for the Management of Waste from Extractive Industries[6] (MWEI BREF).

The MWEI BREF identifies 57 different BAT addressing extractive waste management. These BAT are grouped into 10 generic and 47 risk-specific BAT. The risk-specific BAT require a proper environmental risk and impact evaluation in order to determine their applicability and to identify the relevant and appropriate technique among the techniques listed in each BAT. Although environmental risk and impact evaluation is outlined in BAT 5, this BAT does not further specify best risk management approaches. While the identification of risk management approaches is not within the scope of the MWEI BREF, the identification of risk-specific BAT necessitates guidelines on risk management, such as risk identification and risk assessment to identify the most suitable BAT.

As regards occupational safety and health (OSH), a large body of EU legislation exists with minimum requirements, whereby Member States are free to adopt more stringent protective measures. The main measure is the Framework Directive 89/391/EEC[7], and several related Directives have been adopted, including the Extractive Industries Directive 92/104/EEC[8] which addresses the exploration for and exploitation of minerals in surface or underground mines and quarries. Workers in the sector are likely to be exposed to particularly high levels of risk. Any risk management measures should be in line with these Directives, and as it is a high-risk sector, it is likely that several Member States have adopted stricter protective measures. Guidelines could only be a tool for employers to help them fulfil the obligations from the OSH Directives. It is important that the risk assessment and evaluation remains a dynamic, adaptable and flexible process according to the context. There is a risk that any fixed indications in this respect could possibly give rise to misunderstandings for employers.

Risk management of a mine or any other extractive facility is a holistic approach that takes into account all risks resulting from the construction and operation of a facility. This approach results from the need to optimise the overall safety and environmental performance of the facility. Therefore, this study addresses the risk management related to the entire life cycle of an extractive site by tackling all environmental and safety aspects of an extractive activity including measures to ensure the stability of a facility, including the waste facility, all processes for mineral extraction and treatment as well as the safety of workers.

The Hydrocarbons Guidance Document[9] identifies best risk management approaches and best available techniques for the oil and gas extracting sector. It provides guidance for the risk management of 13 onshore and 10 offshore activities of the oil and gas extracting sector that have the potentially highest impact on the environment and human health. In addition, it identifies best available techniques for the onshore and selected offshore activities.

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[6] https://publications.europa.eu/en/publication-detail/-/publication/f9265d2b-574d-11e9-a8ed-01aa75ed71a1/language-en/format-PDF/source-93598867

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31989L0391&from=EN

[8] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0104&from=EN

[9] http://ec.europa.eu/environment/integration/energy/pdf/hydrocarbons_guidance_doc.pdf

1.2.Objectives and purpose

The overall objective of this study is to support the Commission in the identification and promotion of best risk management approaches for the extractive sector. In doing so, the study supports the following needs:

- Providing guidelines for the integrated risk management of an extractive facility taking into account the most relevant risks resulting from the construction and operation of extractive facilities.
- Providing guidelines to operators and competent authorities for the application of the MWEI BREF in the licensing and permitting process of extractive waste facilities.
- Supporting social acceptance of mining projects by identifying the most relevant risks and by providing approaches to avoid or mitigate them.
- Fostering the sustainable supply of raw materials within the EU by identifying key activities most relevant to ensure sustainability of extractive operations
- Encouraging resource efficiency and the recovery of secondary raw materials.

The purpose of this study is to develop detailed guidelines for risk management in the extractive sector (thereafter called "the guidelines"). The development of the guidelines will include the following elements:

a) identification of key activities that should be addressed in the guidelines
b) collection of information on risk management approaches applied in the EU and worldwide in the extractive sector;
c) close interaction with a Technical Advisory Group on the scope and content of the guidelines;
d) where relevant and feasible, determination of quantitative indicators for risk management;
e) consideration of the entire life cycle of an extractive site from the planning phase to the post-closure phase;
f) specification, where relevant, of environmental and operational monitoring needs;
g) assessment of the economics of the application of best risk management approaches for the sector;
h) identification of best risk management approaches.

More detailed explanations of the tasks a) to h) are provided below.

The Commission will be fully responsible for drawing conclusions from this work as well as for any decisions regarding follow-up action.

1.3.Content / Description of the tasks

The overall scope of this study is to support the Commission in the identification of best risk management approaches for the extractive sector. The study will identify key safety and environmental issues and related activities including worker's safety (thereafter called "key activities") applying a risk based approach. Best risk management approaches will be identified for the activities most crucial for the management of environmental and safety risk management.

BAT for risk treatment have been identified in the MWEI BREF for the management of extractive waste. This study will provide guidance on risk identification and risk assessment to enable the use of the guidelines to identify the most appropriate elements of these BAT for risk treatment. For activities not addressed in the MWEI BREF, the study is expected to identify best risk management approaches including organisational or technical methods for risk treatment.

Task 1: Identification of key activities to be addressed in the guidelines

The objective of this task is to set priorities for the development of best risk management approaches for the onshore extractive sector, excluding oil and gas extraction. This task should identify key activities that are most crucial for the management of the risks of the extractive sector. The assessment should be carried out with a view to identifying best risk management approaches that are not site-specific and are applicable in principle in all EU Member States.

The study will cover the full spectrum of technical risk management of this sector. Excluded are non-technical risks such as uncertainties in the legal, fiscal or social framework conditions for the extractive sector or issues with limited relevance for the EU such as child labour.

The identified list of key activities should be underpinned with technical justifications based on the risks resulting from these activities. The report should rank or categorize proposed processes by priority (high, medium or low priority to ensure the environmental performance and safety of an installation). This list should be complemented with existing standards and guidance and describe the potential of measures to reduce or avoid risks and impacts associated with these activities.

The identification of the key activities is a crucial step in setting the scene and the scope of the study. Chapters 5 and 6 of a background paper[10] prepared for the Hydrocarbons Guidance Document illustrate the expected level of detail.

While the Hydrocarbons Guidance Document is a suitable reference for this study with regard to the conceptual approach, the following elements are not to be retained:

- Distinction between planned and unplanned releases: both scenarios are addressed by risk management;
- Distinction between BAT (for planned releases) and risk treatment (for unplanned releases): both scenarios will be addressed as risk treatment;
- Reference to plans such as extractive waste handling/transport, treatment and deposition plans, NORMs monitoring plan water, closure plans, physical stability monitoring plans, dam safety manual without further specification on how to manage risks in these plans: the study will cover these elements explicitly.

Task 2: Establishment of a Technical Advisory Group

[10] http://ec.europa.eu/environment/integration/energy/pdf/bat_background_paper.pdf

As outlined in the background section, the Commission plans to set up a Technical Advisory Group (TAG) with representatives of the Member States, industries concerned, including equipment and material suppliers and service providers, non-governmental organisations promoting environmental protection and organisations promoting workers health and safety. The contractor will contribute to the identification of members of the TAG in close cooperation with the Commission. TAG members should be selected based on their technical, economic, environmental and/or regulatory expertise (especially in permitting or inspecting of extractive sites) as well as on their ability to bring experience from the end-user perspective. The number of TAG members is expected to be around 40 and members should be prepared to provide advice from a broader perspective. Expertise limited to particular interests with a narrow regional or thematic scope is not desirable.

Task 3: Kick-off meeting of the TAG

The contractor will organise a kick-off meeting to launch the gathering and exchange of information to draw-up the guidelines.

The objectives of the kick-off meeting are to identify:

- the key activities for the extractive sector on which the data collection will focus,
- the life cycle phase(s) to be addressed for each key activity,
- commodities to be addressed, the overall structure of the guidelines (e.g. by commodity or by process) and level of detail,
- nature and extent of the information to be collected,
- data to be collected and elaboration of a data collection strategy,
- ways to ensure the representativeness of the data set needed to identify best risk management approaches,
- ways to deal with potentially confidential business information and sensitive information under competition law, conflicts of interests and related matters,
- timeline for the work,
- specific tasks to be carried out by the TAG members, especially the involvement in the data collection process.

The contractor will prepare the following documents ahead of the meeting:

- a background paper proposing the key activities identified in task 1 and outlining the process of how these issues were identified;
- a strategy for the data collection to elaborate best risk management approaches. This strategy should be based on a comprehensive list of existing references and standards for risk management. This allows to focus the role of the Advisory Group on their experience with the application of risk management protocols in order to identify best risk management approaches.

The contractor will invite the TAG to submit comments and suggestions on the background paper and the information collection strategy ahead of the meeting. The contractor will prepare an updated background paper considering the comments made (summary of comments, accept comments or provide reasons for not accepting them) to facilitate the discussion at the TAG. The updated paper will be sent to the TAG in advance of the kick-off meeting.

The kick-off meeting will be chaired by the Commission.

Task 4: Elaboration of the first draft of the guidelines

The contractor will produce a first draft of the guidelines based on the information collected for consultation with the TAG. The main objective of the consultation is to obtain feedback from the TAG members on the comprehensiveness of the information collected, its relevance, validity and timeliness as well as advice on issues not addressed in this draft.

The structure of the first draft should be as follows:

- Introduction: purpose of the document and context;
- Scope: description of activities covered by the document, interaction with other documents such as the BREF on management of wastes from extractive industries and potential relevance for the implementation of EU and national legislation applicable to the extractive sector;
- General information on risk management approaches in the extractive sector: Concise chapter summarising and describing risk management approaches in the extractive sector: introduction, regulatory context, risk management framework, risk management at corporate and operational levels such as corporate level approaches, operational level approaches, examples of risk management approaches. This document should identify the sector-specific approach for and language used in order to foster the acceptance of the guidelines by the sector. Chapter 3 on "Risk Management Approaches in Hydrocarbons Exploration and Production" of the Hydrocarbons Guidance Document should be used as a reference.
- Best risk management approaches for the key activities:
    - Based on the conclusions on the scope and the key activities drawn by the Commission following the kick-off meeting, the contractor will produce draft chapters for each key activity.
    - Each key activity should be addressed in a separate chapter containing the necessary information for use as a stand-alone document.
    - The chapter should describe the activity and elaborate best risk management approaches.
    - Risk management approaches will be described for all elements of risk management outlined in ISO 31000 (scope, context, criteria – risk identification – risk assessment - risk treatment – communication and consultation – monitoring and review) taking into account and applying the sector specific approach and language used as elaborated in the chapter "General information on risk management approaches in the extractive sector".
    - With regard to operational and environmental monitoring, the information collected should include, where applicable, information on the frequency of the measurement/sampling/monitoring, the averaging period, the period over which values have been collected, the monitoring method, an indication of measurement/sampling/monitoring uncertainties.
    - Specific questions and requests for additional information from the TAG should be spelled out in each chapter.
    - Relevant references are listed in each chapter.

- Glossary of terms and abbreviations;

The first draft will be shared with the TAG, inviting the group to address the specific questions and requests for additional information as well as to provide general comments and advice. The release of the first draft of the guidelines to the TAG is expected to trigger a phase of continuous exchange of information that will allow the contractor to gradually advance the guidelines. Interaction with the TAG will be via e-mail exchanges, exchanges on a shared platform to be provided by the contractor (e.g. sharepoint), video- and phone conferences and by physical meetings. The contractor will offer the TAG the possibility to gather information at the site of TAG members by targeted visits. The contractor should be prepared to carry out up to 10 such visits involving project team members. Furthermore, the contractor should be prepared to participate with the project team in up to 3 ad hoc workshops with several TAG members. Such workshops may be called for by members of the TAG on topics such as fostering a common understanding of the project or integrating and consolidating contributions in a joint effort.

Task 5: Elaboration of the second draft of the guidelines

The second draft will take into account the information provided by the TAG and will elaborate best risk management approaches in detail:

- Best risk management approaches should be described in sufficient detail to give a clear indication of the actions and options available, their risk reduction/prevention potential, cross media effects, technical considerations relevant to their applicability (e.g. geological context), economics and driving force for implementation. Abstract reference to plans without further specification to manage risks is not sufficient, instead essential elements of such plans are to be elaborated by the contractor.
- Risk treatment should be presented as a tool box sorted by ambition level and applicability without prescribing particular techniques for risk treatment in case of a given risk assessment. Reference to BAT in the MWEI BREF should be made wherever risk treatment is addressed in this BREF.
- The contractor should attempt to obtain quantitative parameters for risk identification, risk assessment and risk treatment, e.g. number of years of projected stability of a dam, expected dam failure rate, environmental performance of risk treatment options for releases to water, air and soil. The guidelines should not only elaborate available information but also identify knowledge gaps towards quantitative risk management.
- All essential elements related to the key activities, the associated risks and candidate best risk management approaches should be described.
- Candidates for best risk management approaches should be identified.
- Specific questions and requests for additional information from the TAG should be spelled out in each chapter.

Further elaboration of the second draft of the guidelines should focus on consolidating this draft, ensuring consistency of risk management approaches in the different key activities and assessing experience in the application of the approaches in practice.

For the latter, the contractor will gather risk management protocols for a limited but representative number of installations and perform audits of their performance. This action

will require visits to extractive sites. The contractor should be prepared to carry out up to 10 such visits involving senior staff members. The contractor will include the information obtained during these onsite visits in the elaboration of the 2nd draft of the guidelines.

As outlined in the chapter "elaboration of the first draft", the contractor should offer the possibility of gathering additional information by visits involving project team members. Furthermore, the contractor should be prepared to arrange participation of the project team in up to 3 ad hoc workshops with several members of the TAG. Such workshops may be called for by members of the TAG on topics such as integrating and consolidating contributions in a joint effort.

The second draft will be shared with the TAG inviting the group to address the specific questions and requests for additional information as well as to provide general comments and advice. Based on the input received from the TAG, the contractor will further elaborate the second draft for consultation with the TAG to prepare the final meeting of this group.

Task 6: Final meeting of the TAG and elaboration of the final version of the guidelines

The final meeting of the TAG aims at reviewing the second draft of the guidelines with a view to concluding the technical discussions within this group. At least four weeks in advance of the meeting, the contractor will provide to the TAG:

- a detailed background paper with an assessment of the comments received on the second draft;
- the draft final guidelines.

At the final meeting, the TAG will review the draft final guidelines and advise the Commission on the best approaches for risk management of the key activities. The final meeting will be chaired by the Commission.

Based on the conclusions of the Commission, the contractor will revise the draft final version of the guidelines. This version will be provided to the TAG for a commenting period of 4 weeks. The TAG will be invited to scrutinise the revised guidelines in order to ensure that the guidelines reflect the conclusions of the final meeting. The contractor will support this process by assessing the comments received and by proposing either adjustments to the text or justification for retaining it.

1.4.Project management

The contractor is responsible for the

- management of the project in close cooperation with the Commission.
- preparation of all meetings. The contractor will propose draft agendas, invitation letters and prepare the minutes. Furthermore, attendance lists and name tags are to be provided by the contractor.
- TAG members attend project meetings at their own expense. The Commission may cover the travel expenses of one representative of an environmental NGO and one representative of a union but this will not be financed within the scope of this contract

- Meeting rooms for the inception meeting, kick-off meeting, possible sub-group and final meetings of the TAG will be provided by the Commission.
- Organisation of phone conferences or video conferences with the Commission, if there is a need to discuss certain issues.
- Establishment of efficient communication tools for interaction with and within the TAG. This involves at least an internet platform for the sharing of documents such as sharepoint.

Travel costs of the contractor to Brussels, possible site visits and participation in workshops are to be covered by the contractor.

The contractor will include an additional meeting with the TAG or a subgroup in its contingency planning.

Main steps for drawing-up the guidelines, timetable and expected deliverables:

Step No	Project development step	Expected time for the step (months)	Accumulated time (months)	Deliverable / *Comments*
1	Inception meeting	1	1	Inception report
2a	Activate TAG	3	4	Draft list of members
2b	Identification of key activities	8	9	Background paper for kick-off meeting with scoping section
3	Kick-off meeting of TAG	2	11	Minutes of the meeting
4	Elaboration of 1st draft	5	16	1st draft
5a	TAG comments and gap filling			Table on comments and information received including assessment and follow-up action taken
5b	Elaboration of 2nd draft	8	24	2nd draft
6a	TAG comments and gap filling			Table on comments and information received including assessment and follow-up action taken
6b	Elaboration of final draft of the guidelines for TAG meeting	5	29	Final draft of the guidelines for TWG meeting, background paper
12	Final meeting of TAG	2	31	Minutes of the meeting
13	Elaboration of final guidelines	5	36	Final guidelines