

A scenic landscape at sunset. The sun is low on the horizon, casting a warm, golden glow over the scene. In the foreground, there is a field of tall, green grasses. In the background, there are several layers of mountains, with the closest ones appearing in shades of green and brown, and the more distant ones appearing in shades of blue and purple. The sky is a mix of orange, yellow, and light blue.

# Sustainability Report 2022



# Introduction

Presenting the Sustainability Report 2022, the update issued by Green Minerals AS. This report reflects our commitment to transparency and provides information to our stakeholders on progress towards our sustainability strategy and goals.

## ABOUT THIS REPORT

Green Minerals' Sustainability Report 2022 brings its first update and covers initiatives from January 1 through December 31, 2022. Green Minerals anticipates issuing an update of this report annually. The report was produced in accordance with the Global Reporting Initiative standards. The Sustainable Development Goals and the Ten Principles of the UN Global Compact are used as the main frameworks for our ESG work.

The report will be issued on April 21, 2023, in conjunction with the company's annual report.

With guidance from the Board of Directors, Green Minerals has deliberated over external assurance and has decided not to seek it in this first update. The subject will be discussed again for the next update.

The company has established that any error or outdated information shall be corrected or updated in the next report.

The purpose of the report is to strengthen our sustainability framework by informing our stakeholders about the company's ESG strategy and open a new channel of communication, which allows for more contribution and makes room for improvements.



We welcome feedback on our sustainability report. To share questions or comments, please contact [ir@greenminerals.no](mailto:ir@greenminerals.no)

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## MESSAGE FROM THE EXECUTIVE CHAIRMAN

In the pursuit to accomplish its mission to deliver minerals necessary to the green energy transition in a responsible and sustainable manner, Green Minerals takes responsibility for establishing many «firsts». Our Sustainability Report first published in 2021 is one such. The updated 2022 report reflects our core values and establishes an ambitious and bold program. Our endeavor is to cover our activities in a holistic manner by letting no stone unturned. We believe this is the only way for our activities to be genuinely sustainable. The Green Minerals Sustainability Report sets the foundations on which our research and development will build upon to ensure sustainable exploration and production.

But sustainability demands continuous improvement, and reporting on our impacts helps us to identify many opportunities. Therefore, we are excited to see that there has been important improvements in the standardization within ESG reporting, which includes our contribution in the development of a handbook for the industry that will facilitate comparability and increase transparency and credibility.

2022 was an eventful year for Green Minerals, by receiving major data and consolidating partnerships that will be essential in delivering on our full value-chain approach and thus in maintaining the Company's leading position in the industry.

Green Minerals is in a good position to capitalize on the strong market developments for key battery metals as the green energy transition gathers pace. The Company has chosen a large license on a global scale in the CCZ and the Norwegian Continental Shelf as the most attractive areas to kickstart marine minerals exploration and harvest from.

The Company maintains a relentless focus on maintaining the highest possible environmental standards in our approach to exploring for and harvesting this rich resource to the benefit of the entire planet as the green energy transition gains traction and demand for critical minerals grows.

We believe it is irresponsible to leave the insufficient supply chains of these minerals as they are, with a large dependency on areas of the world with geopolitical tensions. The two areas of key strategic interest to Green Minerals both have the benefit of not only making a meaningful contribution to the worlds need for critical minerals, but also lowering the geopolitical tensions in the hunt for what may turn out to be the most important bottleneck for the worlds Net Zero ambition.

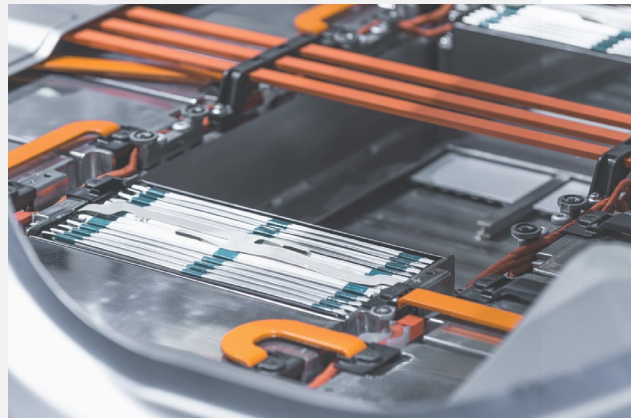
Green Minerals will continue incorporating its sustainability culture in its processes with focus on respecting human rights, prioritizing safety, preserving the environment and biodiversity, and delivering value to its stakeholders.



Ståle Rodahl  
Executive Chairman  
Green Minerals



# ABOUT US



## ABOUT GREEN MINERALS

Green Minerals AS is a public company listed in the Oslo Stock Exchange. The company has the strong backing from its partner SeaBird Exploration including an agreement on administrative and managerial resources, as well as a shared entrepreneurial energy and spirit when it comes to sharing geological and geophysical competencies across the organization.

The company is headquartered in Asker, Norway, and is a global pure marine minerals play actively pursuing license opportunities in several locations, both in Norway and internationally.

Green Minerals is a research and development company supported by a capital-light partnership strategy across the entire value chain. The company timeline has been established with all the currently available information and makes provision for exploration activities as early as 2024 and production activities as early as 2026 towards a full-scale production in 2028.

## MISSION

To deliver minerals necessary to the Green Shift in a responsible and sustainable manner.

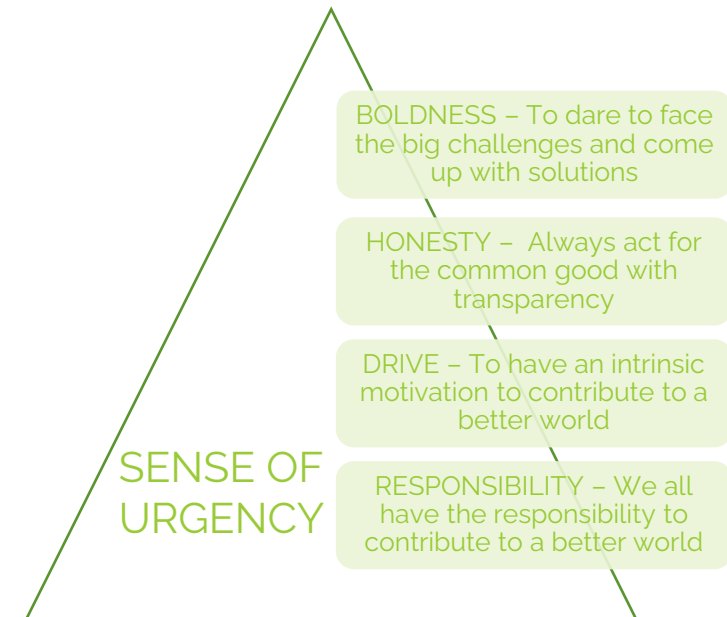
- Deep sea mining of minerals and rare earth elements (REE) is key to the green energy transition, eliminating the huge social costs in onshore mining while reducing the environmental footprint by more than 90%.

## VISION

To be a pioneer in offshore mining and the leader in Marine Minerals on the Norwegian Continental Shelf

## VALUES

Our values are permeated by the sense of urgency that we all must have to start acting towards the meaningful changes our planet and people need.



**BUSINESS STRATEGY**



**The challenge**

Many studies have confirmed the huge discrepancy between demand and supply of critical minerals essential for key clean energy technologies needed to meet the global climate ambitions. The onshore mining industry leaves an unsustainable environmental footprint to extract the marginal tonne of mineral, as ore grades decline, deforestation increases and waste per tonne ore soars. Moreover, terrestrial mining exhibits significant social costs. Because mineral supply is currently concentrated to a few countries, sourcing critical raw materials has also become a national security matter for the EU and the USA.. The following questions arise: how can we mine the metals needed for the green energy transition in a sustainable manner and where should they come from?

**Our solution**

70% of our planet is covered by the oceans. The seafloor contains vast amounts of the minerals needed for the green shift. Careful deep-sea mining of these raw materials can reduce the environmental footprint in mining up to 90%, while solving the challenges related to social costs and the strategic supply to the EU and USA. With an estimated resource potential of more than NOK 1000bn combined with the vast knowledge of deep-water operations acquired through decades of offshore activity and a high quality, stable regulatory framework, the Norwegian Continental Shelf is the most attractive area in the world to kickstart the deep-sea mining industry from.

Side-by-side comparison offshore vs onshore mining (impact of minerals to 1 bn electric cars)

	ONSHORE	OFFSHORE	%CHANGE
CO2 EQUIVALENT EMISSIONS, Gt	1,5	0,4	-70%
ORE USE, Gt	25	6	-75%
DEFORESTATION, km2	66.000	5.200	-92%
SOLID WASTE, Gt	64	0	-100%
FRESHWATER ECOTOXICITY, 1,4-DCB equivalent Gt	21	0,1	-99%
MEGAFAUNA WILDLIFE AT RISK, TRILLION ORGANISMS	47	3	-93%
Source: Paulikas et al 2020			



# SUSTAINABLE DEVELOPMENT

Sustainable development is a concept intrinsic to our business. Providing the minerals critical to the green energy transition in a responsible and sustainable manner addresses both the current needs and the capacity of future generations to satisfy their own needs.

Our sustainability strategy has two dimensions:

- **External:** we deliver critical minerals to mitigate climate change by enabling entire industries to create products that will generate significant positive impact on a global scale, like renewable energy production and electrical vehicles.
- **Internal:** where we identify the impacts from exploration and production activities, aiming to improve our own environmental performance, to create value to our stakeholders, including local communities where we operate and to promote a safe, equitable, diverse and inclusive workplace.

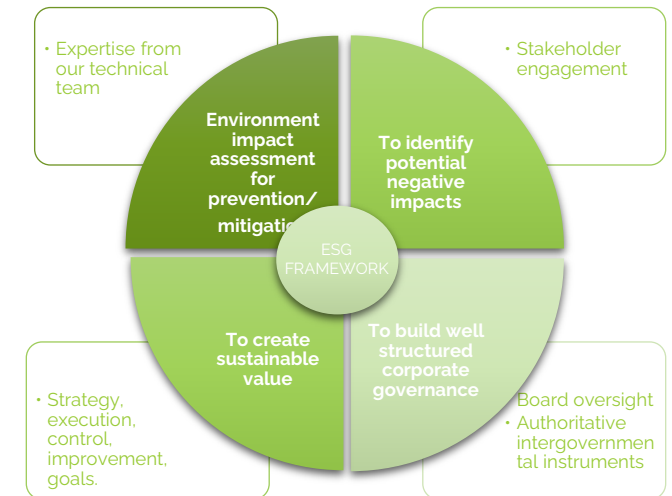
Our ESG framework allows us to control our processes and manage their impacts. Through stakeholder engagement, Green Minerals identifies potential negative impacts. Based on international authoritative intergovernmental instruments and internal expertise, the company develops policies and procedures to prevent and mitigate these impacts. This process enables us to identify opportunities and threats and to develop corporate sustainability strategies.

To realise our ambitions, we commit to systematically integrate sustainability across our business and throughout our operations and value chain.

Our policies and procedures reflect how the company sustainably performs its business. We expect our business partners to comply with our policies and procedures, to respect regulations and to act with high moral and ethical standards. It is in progress the development of processes to outline our expectations

for our partners to commit to ambitious climate targets and to respect human rights.

A vital part of the company’s strategy for sustainable development is environmental impact assessment. The project Ultra, announced in 2021, through research cruises, provide data with relevant information on impact on the environment. For example, one of our PhD students’ work on alteration of extinct seafloor massive sulphide will produce information that can be used for an environmental base study prior extraction to identify metals that are toxic if released. These information will be used to define strategies for the exploration phase which is anticipated to start in 2024. Full scale production is expected to start in 2028.

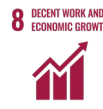




The 2030 Agenda for Sustainable Development was adopted by all United Nations Member States in 2015 and has 17 Sustainable Development Goals, which aim to guide society to a better future for all. Companies play an important role in the achievement of the Goals due to the relevance of the impact they have on the economy, people, and the environment. As a responsible company, Green Minerals has the ambition to act on all the Goals, but focus on the following:



By contributing to increase the share of renewable energy.



By creating decent jobs and sustainable economic growth



By sustainably supply rare earth elements and base metals



By reducing waste generation and enabling the green energy transition



By reducing CO2 emissions through multiple actions, like promoting the use of energy efficient technology combined with renewable energies



By making assessment of potential negative impacts from deep-sea mining and creating effective actions for prevention and mitigation, aiming to protect the oceans and biodiversity



By creating tools to ensure that all our value chain acts in accordance with the law, respects human rights and encourage people to report any deviation.

**WE SUPPORT**



In December 2022, Green Minerals became a participant of the United Nations Global Compact, a voluntary corporate sustainability initiative to align strategies and operations with universal principles on human rights, labor, environment, and anti-corruption, and take actions that advance societal goals. Green Minerals' participation is an opportunity to continuously enhance its ESG program, through valuable support and information on how to turn strategies into action. The company must report to UNGC on its progress yearly.

More about the Ten Principles [here](#).

Visit our page on UNGC [here](#).



# STAKEHOLDERS



The activity of the company currently consists of research & development. The company has performed an initial stakeholders identification based on its internal experience and expertise. A comprehensive stakeholders analysis report will be carried out at a later stage as the complexity of its activities grows. The company will update this report as required when new data is available. The identified stakeholders of the company are represented here.



**STAKEHOLDER ENGAGEMENT**

The engagement with stakeholders supports the company with identifying relevant impacts both actual and potential. This activity also provides the company with opportunities for improvement. Transparency is a core value for the company, and we consequently want to keep our stakeholders informed about the company's results and strategy.

# Our vision : creating the entire value chain of marine minerals



With reference to the numbering presented in the previous page, the main segments of the marine minerals value chains are:

**1. Exploration and Engineering:**

The goal of exploration and engineering is to discover marine mineral resources and establish mining plans to sustainably mine the metals necessary for final users to produce e.g. wind-turbines, solar panels, electrical vehicles (EV) or electrical grid components.

The first step of exploration consists in identifying areas where marine minerals accumulation can be present i.e. prospective areas. When prospective areas have been identified, the company must engage with the authorities responsible for the stewardship of the prospective areas. In the context of marine minerals, the prospective areas can be found in:

- Exclusive Economic Zone (EEZ) e.g. Japan, the Cook Islands or Papua-New Guinea
- National jurisdiction e.g. the Mohn-Knipovitch Ridge as part of Norway's extended continental shelf
- International areas (also called "The Area") which are regulated by the International Seabed Authority (ISA)

mandated by the United Nations (UN).

Generally, the right of exploring a prospective area is granted to the company through a license delivered by the competent authorities. After being granted an exploration license, the company will start exploration works at regional scale using large scale information such as bathymetry and sub-surface expression which will enable the geologists to concentrate their efforts on smaller targets. These smaller targets will then be sampled:

- to confirm the presence of mineralisation of interest and
- to define the size of the mineral deposit and the quality of the ore contained within it

In parallel, environmental baseline surveys are performed to determine:

- the environmental conditions at the deposit (local)
- the characteristics of the ecosystem present at the deposit (local) and its relationships with other ecosystems (regional)

The geological (resource) and environmental information will support the mining engineers in determining if the candidate resource can be mined in a sustainable

manner through a cycle of studies which encompass technical, environmental, and economic criteria. The result of this studies supports the mining plan and Environmental Mitigation and Monitoring Plan (EMMP) necessary for the company to obtain a mining authorisation from the competent authorities. In parallel of the feasibility studies, the company engages with local communities to understand its impact on the local society and tackle grievance issues as early as possible.

As part of the mining plan, the company defines in tight collaboration with suppliers and 3<sup>rd</sup> party verification bodies:

- the mining system
- the mining procedures and related logistic plan (ore transportation and offshore operations support)
- the mineral processing route or flowsheet determining how the metal commodities will be produced
- the environmental procedures and equipment necessary for executing the EMMP



**2. Offshore Production:**

This part of the marine mineral value chain focuses on extracting mineral ore from the seafloor, transport it to the surface, and transfer it to bulk carriers for transportation to land. The offshore production system i.e. the mining system, consists of:

- The mining machines responsible for excavating the seabed;
- The monitoring and support equipment, typically embodied by Remote Operated Vehicles (ROV);
- The vertical transportation system e.g. a vertical riser pipe and the pumping system ensuring the convection of the excavated material to the surface;
- The surface processing equipment responsible for receiving the excavated material when it reaches the surface, handling and storing the excavated material within the cargo hold of the mining vessel;
- The offloading system equipment responsible for transporting the excavated material from the cargo hold of the mining vessel to the bulk carriers;
- The mining vessel, the central asset which provides power and control to the equipment mentioned above.

The company will engage in monitoring activities to ensure the mining activities are carried-out within the criteria established within the EMMP. Prior to start the full-scale production of marine minerals at a given deposit, the company will execute some pilot mining to:

- confirm the mining systems performance as per the specifications establish in the mining plan
- test the contingency and emergency procedures to ensure the adequacy of the Health, Safety and Environmental (HSE) working procedures towards:
- the safety of the working personnel

- the safety of the mining equipment
- the respect of the EMMP
- identify ways of improving operational procedures, HSE routines and the EMMP.

In operation, the company will ensure that HSE is considered as the top-priority through the presence of dedicated HSE advisors responsible for the management and the continuous improvement of HSE working procedures.

The company currently intends to sub-contract the offshore production activity but will keep the overall responsibility for this activity to ensure the mining operations comply with the international and local regulations and the upcoming guidelines and best practices.

The company will also ensure that maximum value is created for the local communities by:

- engaging with local stakeholders such as fisheries
- behaving transparently towards environmental actors either public or NGOs
- promoting a local training and hiring process



**3. Offshore Logistics:**

Offshore logistics ensure:

- The transport of the mineral ore from the offshore worksite to a dedicated shore location
- The transport of personnel from/to the offshore worksite
- The delivery of fuel and equipment to the mining system

The offshore logistics function is central to the value created by the mining system as it directly contributes to its performance.

The company intends to sub-contract the logistics activities but will keep the overall responsibility for this activity to ensure the logistics operations comply with the international and local regulations as well as upcoming guidelines and best practices.

As for Offshore Production, the company will ensure that HSE is considered a top priority through constant monitoring of the selected suppliers' metrics through audits.

The company will also ensure that maximum value is created for the local communities by preferably selecting local suppliers or suppliers which engage with the local communities themselves.



**4. Onshore Production:**

During Onshore Production, the mineral ore, which has been excavated from the seabed by the mining system and transported to land by offshore logistics, is transformed through mineral processing and refining into sellable metal commodities. Onshore Production is generally achieved in two steps as follow:

- 1.Processing of the delivered marine ore into a concentrate i.e. mineral processing
- 2.Refining of the concentrate into a sellable commodity i.e. smelting and refining

These two steps are generally performed by different facilities at different locations. Mineral processing, in the frame of land mining, can be performed at the mine site in a dedicated processing facility. Smelting and refining are generally sub-contracted to smelting and refining facilities

.For mineral processing the company considers the following options:

- 1.Entering in a partnership with a mine complex including mineral processing facilities
- 2.Delivering the mineral ore to a partner processing plant

For mineral smelting and refining, the company intends to sell the concentrates produced by the mineral processing

plant to a smelter which is de-facto the company's final client.

When selecting its mining partner or mineral processing supplier, the company will consider the same ESG and HSE criteria as for Offshore Production and Offshore Logistics to ensure that the highest ESG criteria can be maintained through the value creation process of the company. In practical terms, the company will preferably select its partners/suppliers based on their ESG metrics but also looking at the most sustainable options accounting for:

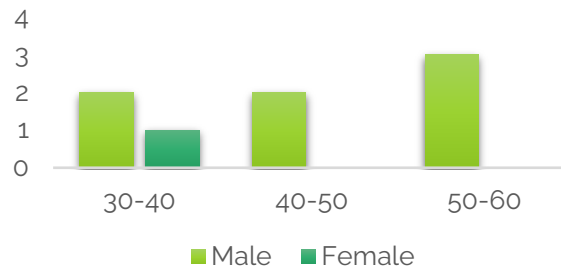
- Location of the mineral processing plant:
  - to reduce the energy cost of transporting the ore from the Offshore Logistics harbour to the mineral processing plant
  - to ensure the lesser environmental footprint of the processing plant with regards to sensitive ecosystems, as a processing plant is a source of chemical waste which must be stored in vicinity of the plant itself (tailing ponds or dams)
- The most attractive mineral processing route which minimises the energy footprint, the required chemicals, and the amount of mineral waste to be stored (tailings)
- The source of energy for the mineral processing plant itself by preferring facilities powered by renewable energies as opposed to e.g. coal-fired power plant

# OUR PEOPLE



At Green Minerals, there is a total of 8 professionals passionately engaged to contribute to the Green Shift. The company relies on their expertise and motivation to drive us towards our goals, until ultimately transforming into a truly circular economy business model. Our technical team is made up of 3 full-time employees working from our headquarters in Asker, Norway, while supported by the SeaBird administrative team in Asker and Bergen. There is one female worker who is engaged through a consultancy agreement and whose work is controlled by the company. She performs administrative work, social medias, maintenance of website and assists the management team.

Number of associates per age group



## Diversity and Inclusion

Green Minerals believes that a diverse work team is key to keep developing. Respect for everyone free of discrimination based on race, gender, sexual orientation, disability, and other personal characteristics is a solid base of our culture. The company acknowledges the importance of taking action to promote and ensure equal opportunities and works toward a balance between the genders, increased diversity and inclusion in all levels of the business. Three different nationalities from very different parts of the world are represented in the team, ensuring all the benefits of multiculturalism.

Green Minerals did not open for new hirings in 2022, but as reported in the previous year, Green Minerals has tried to hire women for management positions but was not successful. The company is aware of the challenges to hire people in an industry that is still under development, so as the company grows, it will focus on gender diversity. To make it possible, work to identify areas of improvement in this regard is in progress.

It is important to highlight that Norwegian laws for gender equality are very mature compared to other countries, assuring rights protection. Green Minerals bases its internal policies on the Equality and Anti-Discrimination Act.

## Flexibility

COVID-19 changed the way we work. The restrictions adopted as measures to fight the virus confirmed that it is possible to be more flexible in the way we organise our work. At Green Minerals, we believe that allowing for flexible working hours and remote working keep employees more productive, build a more positive working environment and support a healthy work and personal life balance.

## Well-being at work

Green Minerals' headquarter was chosen with the aim of supporting the well-being of our employees. The building offers perfect accessibility, comfortable common areas including massage chairs, a café, a restaurant and a gym.

## Training and development

In 2022, employees had access to the ESG training and development portal, and all of them have overfulfilled the minimum hour monthly requirement.

Training hours per department



## Occupational Health And Safety

The company is currently progressing on establishing its occupational health and safety management system as described in Disclosure 403-1. The major part of the work carried out by the company being anticipated as performed by suppliers, the company will establish procedures for reviewing the supplier's occupational health and safety management system and will allocate internal resources for monitoring that suppliers' HSE procedures are followed when work is performed on the company's worksite e.g. within an offshore license belonging to the company or in the frame of a project owned by the company. The company will also disclose the information required by the:

- *Disclosure 403-2 Hazard identification, risk assessment, and incident investigation* i.e. documents pertaining to the HSE section of the company's BMS
- *Disclosure 403-3 Occupational health services* i.e. the job descriptions of HSE related personnel as part of the company's BMS
- *Disclosure 403-4 Worker participation, consultation, and communication on occupational*

*health and safety* i.e. reporting the processes pertaining to this disclosure as described in the company's and suppliers' respective BMS

- *Disclosure 403-5 Worker training on occupational health and safety* i.e. reporting the description of any occupational health and safety training provided to workers, including generic training as well as training on specific work-related hazards, hazardous activities, or hazardous situations.
- *Disclosure 403-6 Promotion of worker health* i.e.
  - o an explanation of how the organization facilitates workers' access to non-occupational medical and healthcare services, and the scope of access provided especially for worksite where public medical and healthcare services are not available or not easily accessible.
  - o a description of any voluntary health promotion services and programs offered to workers to address major non-work-related health risks,

including the specific health risks addressed, and how the organization facilitates workers' access to these services and programs.

- *Disclosure 403-9 Work-related injuries* based on the company's HSE reporting which is common practice in industries such as Oil and Gas. The company commits to a Zero-target for work-related injuries.
- *Disclosure 403-10 Work-related ill health* based on the company's HSE reporting which is common practice in industries such as Oil and Gas. The company commits to a Zero-target for work-related illness.

### Proposed monitoring system

The company will ensure the information concerning its HSE performance is available by implementing the necessary procedures within its Business Management System.

### Aspirational Goals

The company has a zero-injury tolerance policy.

# HEALTH & SAFETY





# GOVERNANCE



## Board of directors

Green Minerals' Board of Directors is diverse in age, experiences, and field of expertise, with high knowledge in corporate management, economy, and geoscience, fulfilling the strategy at this phase of the company. All Board members are involved in matters that are significant to the company's financing, operational, ESG performance, and long-term sustainable development strategies.

## Nomination

The members of the Board are proposed by the shareholders and are appointed in the Annual General Meeting.

## Chair of the Board

The Chairman in Green Minerals is an Executive Chairman of the Board. This means that the Chairman is involved in some operational activities beyond normal board-level interaction with management. The arrangement has been put in place to strengthen the management team in matters of a strategic and tactical nature and create closer ties between management and the Board. Conflicts of interest are prevented through frequent Board meetings by telephone/Teams as well as interactions with the CEO and CFO.

## Overseeing the management of impacts and delegation of responsibilities

The Board of Directors has had direct participation in the process of developing and approving the organization's vision, values, mission statements, strategies, policies, and goals related to sustainable development. These measures shall all be reviewed every third year by the Board. If any change is proposed by senior management, it shall be taken to the approval of the Board.

Any information received by the company from relevant stakeholders through available channels of communication (see Stakeholder engagement on page 09) about actual or potential impacts that might affect sustainable value creation in the financial, social, or environmental dimensions, shall be taken to the Board. The Board has direct contact with shareholders through Green Minerals' website [Investors – Green Minerals](#)

Actual negative impacts are presented to the Board with an overview from the management team and possible actions for mitigation and its possible outcomes and deadlines, so the Board can discuss, approve a strategic plan, and follow up the results.

The responsibility for managing impacts shall be analysed and appointed by the Board for each case.

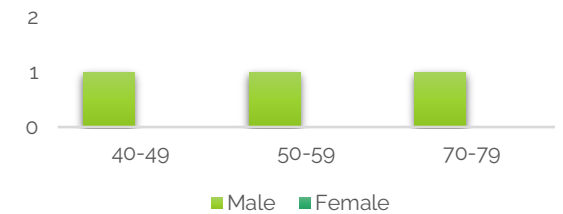
## The Board and the sustainability reporting process

The role of the highest governance body in sustainability reporting is structured as follows:

The first step is for the Board to approve the material topics that were identified as most relevant impacts through stakeholder engagement and the ones proposed by the management team in the beginning of each year.

When all the data for the year is available, the sustainability report team is responsible for collecting them, including communication with stakeholders, like supplier ESG assessment. The sustainability report team writes and sends the report to the Board for approval.

The Board of Directors by age group



**Conflict of interest**

If a director has an interest in a case under investigation by the Board, the director should immediately declare the interest and be considered inapt to attend meetings and prevented from voting or exercising any influence on the matter.

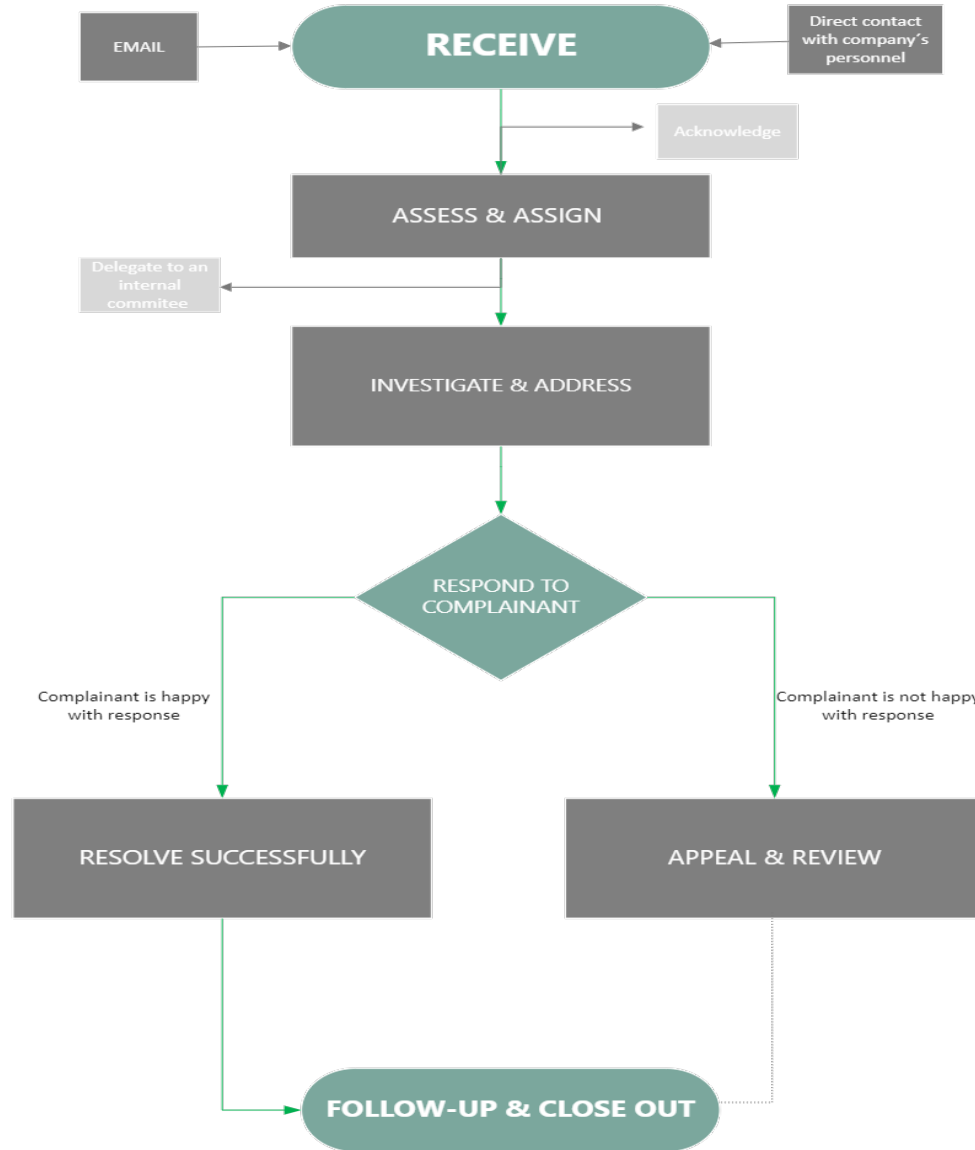
Other information about conflicts of interest are informed in our Code of Conduct available on our website, [www.greenminerals.no](http://www.greenminerals.no).

**Communication of critical concerns**

Green Minerals encourages everyone who wishes to make a communication of critical concerns to use our whistle-blower channel [whistle@greenminerals.no](mailto:whistle@greenminerals.no). A member of the highest governance body is part of the process of monitoring anonymous reporting lines to help identify concerns or issues from formal grievances, which gives more credibility to the process. The whistle-blower e-mail is now our only available tool for raising any type of concern anonymously, due consideration of the current activities of the company.

No critical concerns were communicated during the reporting period.

Following the Guidance grievance mechanism from ICMM, Green Minerals focus in making the mechanism accessible and predictable, so we describe our standard process through the next flowchart (the process might suffer alterations depending on the severity of each case):



**Remuneration policies**

Green Minerals aims to offer a level of remuneration that is fair, motivates, attracts and retains members of the Board and employees in accordance with the financial situation of the company, ensuring that remuneration supports and drives its strategic priorities.

The remuneration of the Board members is decided by the shareholders at the Annual General Meeting. The Board members do not receive variable payments.

The Board appoints the CEO and approves his/her remuneration and is further responsible for ensuring that management remuneration principles are aligned with the Company's objectives and shareholder interest.

Remuneration for the Chief Executive Officer (CEO) consists of:

- annual base salary (ABS)
- long term incentives (Employee ownership scheme)

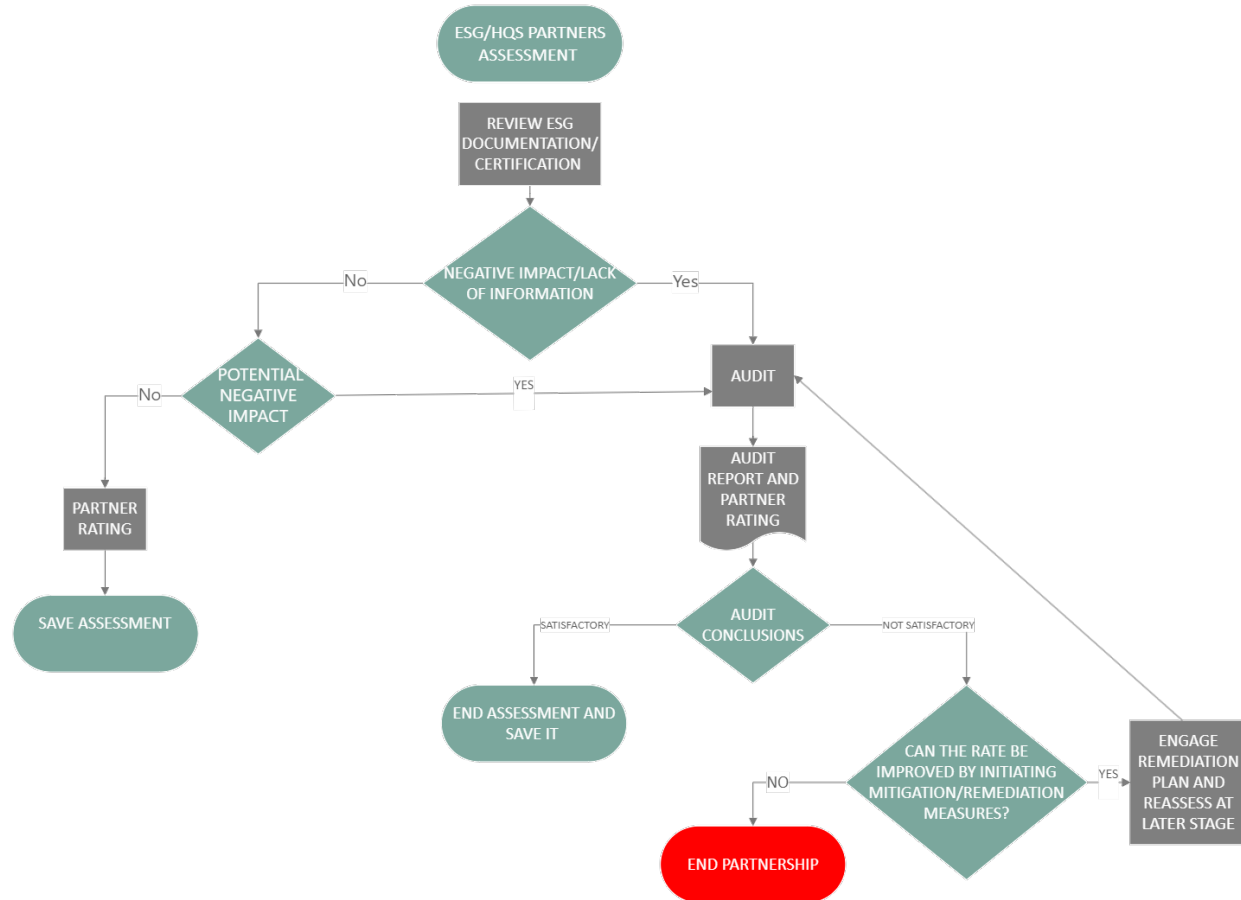
Green Minerals commits to sustain a responsible business conduct that respects people, society, and the environment. Our Human Rights policy and our Code of Conduct guide our activities and were written in accordance with the following authoritative intergovernmental instruments: Guiding Principles on Business and Human Rights, Due Diligence Guidance for Responsible Business Conduct, The International Bill Of Human Rights, International Labour Organisation Declaration on

Fundamental Principles and Rights at Work, United Nations (UN), Rio Declaration on Environment and Development, 1992. Following the 5-step Framework for Risk-Based Due Diligence from The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, the commitments stipulate a process for due diligence. The document is reviewed by top management and approved by the Board of Directors.



Being a lean and efficient organization means that it is vital for Green Minerals to partner with leading and upright companies. To ensure a thorough due diligence process, the company has developed the flowchart below. The initial step is an ESG/HQS partners assessment, with the purpose of getting partner familiar with the partner's ESG/HQS programs, commitments to International

recognised standards, certifications, potential or actual negative impacts and actions for mitigation or prevention. When negative impacts are identified or further information is needed, the process stipulates an audit. This assessment aims to identify early red flags and work closely with the partner on mitigation/remediation plans.



This Sustainability report is evidence of the company's application of the precautionary principle. Before the start of the exploration or production phases, the company is working to identify any potential environmental, social and financial risks, and studying the opportunities for prevention or mitigation for the potential negative impacts.

Green Minerals' policy commitments for responsible business stipulates respecting human rights and advocates the belief that all human beings must be treated with dignity, equity and empathy. The Human Rights policy and the Code of Conduct are available to all our employees and stakeholders on our website

[www.greenminerals.no](http://www.greenminerals.no) Employees are required to sign a read and understood for all the policies and procedures. The company is also creating procedures to ensure that all our value chain confirms their commitment to act in accordance with the law and respects authoritative intergovernmental instruments named in this report.

**Embedding policy commitments**

Once the commitments are approved by the Board, the management team makes sure that all employees have read and understood the commitments.

They are a support for our processes and relationships to our stakeholders.

**Processes to remediate negative Impacts**

Green Minerals is committed to provide for or cooperate in the remediation of negative impacts that the organization identifies it has caused or contributed to. The company works to identify potential negative impacts in its future operations and projects and how to address grievance. Green Minerals will always act in accordance with the law, with honesty and responsibility to account for any direct or indirect negative impact and its consequences.

**Mechanisms for seeking advice and raising concerns**

Anyone can seek advice or raise concerns by talking to our management team. In case of the employees, they are encouraged to talk to the line manager.

If, for any reason, the person wishes to be anonymous, they can communicate the concern through the email: [whistle@greenminerals.no](mailto:whistle@greenminerals.no).

The whistle-blower procedure applies to anyone who wishes to report a violation. Employees have access to our whistle-blower procedure in our intranet and must certify that they have read and understood it.

Suppliers, subcontractor and third-party personnel are informed about the procedure. The procedure is also available on the company's website.

All our employees and business relations have an obligation to report anything which he or she believes is a material violation of law or company policy or any questionable business practices by members of senior management or any other employees.

Human resources and a member of the highest governance body are responsible for monitoring the anonymous reporting lines, identifying issues from formal grievance and informing the CEO of any reported violations. An internal investigative committee will investigate concerns raised in accordance with company policies and, if required, retaining outside legal counsel or any other resource that the Committee reasonably believes is necessary for conducting a full and complete investigation of the allegations, and promptly reporting of investigation findings to the CEO and/or the Board, who will make a decision for next steps based on the law and the company's policies.

In case of projects that might impact local communities or vulnerable groups, the company plans to make the

mechanism clearer and even more accessible, by promoting it on an ongoing basis, as well keeping a good communication with community's representatives. If any serious impacts are identified, a third part free from any discrimination to the community, vulnerable groups or the industry will be invited to participate in the investigative committee.

The materiality assessment is key in the ESG program, as it guides the company to identify the most relevant economic, environmental and social impacts in relation to the stakeholders' interests. Hence engagement with our stakeholders is vital to prioritize impacts and allocate resources where they are most needed.

The material topics were determined based on a general concern about the potential negative impacts from deep sea mining on the environment and specifically pointed out by internal expertise after assessment of significance of the impacts. These concerns have been expressed by governments, academia, non-governmental organizations, financial institutions and shareholders through different channels: internet, traditional media and meetings.

After the assessment, the material topics were approved by the Board of Directors.

MATERIAL TOPICS	RELATION TO SDG	MINIMAL REQUERIMENT	POSSIBLE MOSTSTRINGENT REQUIREMENT
Emissions	13: Climate Action	IMO (Vessel Fuels)	NORSOK (Norway)
Water and Effluent	6: Clean Water and Sanitation 14: Life below Water 15: Life On Land		
Waste	15: Life On Land		
Biodiversity	14: Life below Water 15: Life On Land	ISA Future Mining Code	NORSOK or similar (Norway)
Environmental compliance	N/A	N/A	N/A
Supplier environmental assessment	6: Clean Water and Sanitation 13: Climate Action 14: Life below Water 15: Life On Land	IMO (Vessel Fuels) DNV GL (Classification of vessels) Mining Code?	
Occupational health and safety	3: Good Health and Well-Being	N/A	Arbeidstilsynet (Norway)

# ENVIRONMENT



With reference to the value chain illustrated on page 11, the company expects the following emissions:

- Exploration: burning of fossil fuels as marine fuel for exploration vessel
- Offshore Production:
  - burning of fossil fuels as marine fuel necessary for:
    - the mining production vessel and various subsystems ensure excavation, vertical transport, and surface ore processing
    - the bulk carriers ensuring the transport of ore from the offshore mining site to a shore facility
  - burning of fossil fuels as for if the shore facility is not the delivery point of the ore to the final client, the transport of ore from a shore facility to a mineral processing plant
- Onshore Production:
  - Electricity production/consumption for:

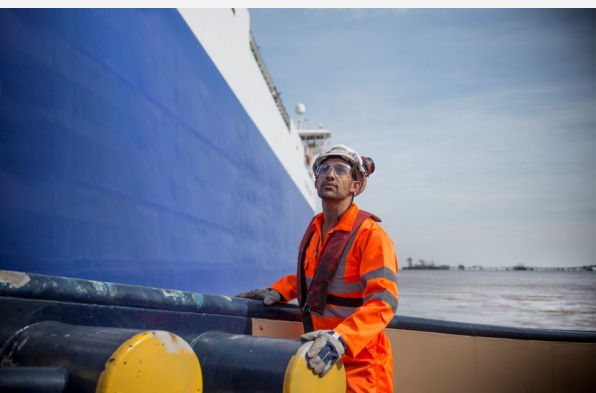
- Crushing and characterisation units transforming the ore into a feed
- Flotation or Separation units to beneficiate the metals present in the feed into a concentrate
- Transport of produced concentrate to a refining facility
- At present, the company does not have any plan for owning the above-mentioned activities following its CAPEX light strategy. Therefore, all emissions of significant impact are considered to be classified as Scope 2.
- Company intends to comply with IMO regulations i.e. MARPOL. Especially for emissions, MARPOL Annex VI is relevant. For any new ship which tonnage is higher than 400 gross tonnage the following applies:
- For new ships, the Energy Efficiency Design Index (EEDI) has been developed as a technical measure.

The objective of the EEDI is to ensure that ships are designed and constructed to be increasingly more and more energy efficient.

- The principal operational measure is the Ship Energy Efficiency Management Plan (SEEMP). Every ship of 400 gross tonnage and above is required to have a SEEMP. It is an on-board management tool and has two parts:
  - The first part sets out the requirements for energy efficiency management.
  - The second part is a requirement for monitoring and reporting the ship's annual fuel consumption.

Meeting both the EEDI and SEEMP criteria will allow the ship to be granted International Energy Efficiency Certificate, or IEEC. The company will favour working with marine assets which have been granted an IEEC when this option is available.

# EMISSIONS



The following yearly previsions have been estimated for future operations:

**Exploration from 2024**

As a base case the company foresees utilising exploration vessels for a combined duration of 93 days per year i.e., 3 campaigns of 1 months as described in Table 1

Per campaign	Days
Port call	4
Transit	6
Operations	21
Total	31
Total 3 campaigns (2024)	93

Table 1: Expected vessel days for 2024 Exploration activities

Exploration vessels are assumed to be similar to the ones used for oceanographic and seismic surveys. A major part of the energy consumption of this vessels relates to propulsion during transit and the station keeping while at sea.

Based on the ESG reporting from Seabird Exploration, a seismic service provider and partner of Green Minerals, predicted fuel consumptions and associated emissions have been calculated and are reported in Table 2 based on typical fuel consumption and emission factors presented in Table 3:

Per campaign	Days	Fuel consumption (t)	CO2 Emission (t)	NOx Emission (t)	Sox Emission (t)
Port call	4	2.8	9.094	0.107	0.002
Transit	6	33.3	106.575	1.257	0.018
Operations	21	75.5	241.586	2.849	0.040
Total	31.0	111.6	357.255	4.213	0.059
Total 3 campaigns (2024)	93.0	334.92	1071.764	12.640	0.178

Table 2: Expected emissions for 2024 Exploration activities

Activity	Daily fuel consumption (t)
Port call	0.71
Transit	5.55
Operations	3.60

Emission Type	Emission factor
CO2	3.20
NOx	0.04
SOx	0.0005

Table 3: Typical fuel consumptions and associated emissions for exploration vessels

The company highlights the fact that the marine fuel space evolves rapidly. The company's will challenge and encourage its future service providers to use renewable-based marine fuels e.g., green ammonia or biofuel to reduce the CO2 emission generated by exploration activities. The company is also considering other exploration platforms such as Unmanned Surface Vehicles (USV) which have by design reduced fuel consumption requirements and thus reduced CO2 emission.

**Offshore Production from 2026**

The company has started a conceptual study for its mining system thus the following information is given and may change in the future. Existing systems are experimental and little information is publicly available. The following figures have been established based on publicly available figures and the company's foreseen operations. The Offshore Production system consists of three main sub-parts:

- The Mining Supporting Vessel: supporting the excavation, vertical transport and essential processing function e.g., slurry dewatering
- The Ore Transport Shuttles: transferring the ore from the offshore mining site to a shore facility



- The Personnel Transport Vessel: transferring personnel to/from the Mining Supporting Vessel

Based assumption:

- Mining Vessel will be used 365 days per year
- Ore Transport Shuttles: one rotation every week, 96 hours of transit in and out resulting in a use of 208 days per year
- Personnel Transport Vessel: one rotation every two weeks, 96 hours of transit in and out resulting in a use of 104 days per year

**a. Mining Support Vessel**

- The energy required for propulsion and the supply of mining equipment will be ensured by the installed marine engines and association generators. The company assumes an onboard installed power of 40MW based on previously proposed concept by others associated with a utilisation rate of 60%.

The anticipated fuel consumption of such a vessel can be estimated using the Specific Fuel Oil Consumption (SFOC) of installed marine engines. In the absence of an established concept, the company considered the SFOC of currently available marine engines and assumed a typical value of 175g/kWh. The resulting anticipated emission for the Mining Support Vessel are presented in Table 4.

Mining Vessel characteristic	Value
Installed Capacity	40MW
Utilisation rate	60%
SFOC	175g/kWh
Fuel consumption	36.792t/year
Emission Type	Emission factor
CO <sub>2</sub>	3.20
NO <sub>x</sub>	0.04
SO <sub>x</sub>	0.0005
Predicted Emissions	Value
CO <sub>2</sub>	117.845t/year
NO <sub>x</sub>	1,389t/year
SO <sub>x</sub>	20t/year

Table 4: Expected emissions for 2026 and beyond Mining Vessel

**b. Ore Transport Shuttles**

Expecting an annual ore production of 1.5Mtpa, assimilating the oreshuttles to bulk carriers of type Handysize (DWT<35,000T) and using the Green Voyage spreadsheet provided by IMO<sup>4</sup> the estimated emissions for the ore transport shuttles from 2026 and beyond are presented in Table 5.

Ore Transport Shuttle (Bulk Carrier DWT<35,000T)	Value
Fuel consumption	3,528.3t/year
Yearly utilisation rate	57%
Emission Type	Emission factor
CO <sub>2</sub>	3.20
NO <sub>x</sub>	0.04
SO <sub>x</sub>	0.0005
Predicted Emissions	Value
CO <sub>2</sub>	6,436t/year
NO <sub>x</sub>	80t/year
SO <sub>x</sub>	1t/year

Table 5: Expected emissions for 2026 and beyond - Ore Transport Shuttles

### c. Personnel Transport Vessel

The company assumes that the Personnel Transport Vessel will be similar to the offshore supply and service vessels operating in the oil & gas and the wind offshore industries. The electrification of this vessels is underway and current hybrid vessels have reported emission cuts in the range of 20% compared to vessels operating only using fossil fuels<sup>2,3</sup>. Using the Green Voyage spreadsheet provided by IMO<sup>1</sup> and the emission reduction provided by the hybrid power system of the current and future generations' vessel, future emissions for the Personnel Transport Vessel have been estimated and are reported in Table 6.

Personnel Transport Vessel (similar to Offshore Service Vessels)	Value
Fuel consumption	1,362.3t/year
Yearly utilisation rate	28%
Hybrid Vessel emission reduction factor	20%
Emission Type	Emission factor
CO <sub>2</sub>	3.20
NO <sub>x</sub>	0.04
SO <sub>x</sub>	0.0005
Predicted Emissions	Value
CO <sub>2</sub>	244t/year
NO <sub>x</sub>	3t/year
SO <sub>x</sub>	0.04t/year

Table 6: Expected emissions for 2026 and beyond – Personnel Transfer Vessel

### Onshore Production from 2026

In the absence of a defined processing route, the company has made assumptions for the CO<sub>2</sub> emissions related to copper ore processing based on public information<sup>4</sup>. CO<sub>2</sub> emissions from various copper processing plants in the world have been estimated at a 2.6t CO<sub>2</sub>/ t Cu produced, with minimum value at 1t CO<sub>2</sub>/ t Cu produced and maximum 9t CO<sub>2</sub>/ t Cu produced. CO<sub>2</sub> emissions tend to be lower if the ore quality (grade) increases and when renewable energies are available to the mineral processing plants. Because the company assumes an ore grade of 6% copper (5 times the ore grade of traditional copper deposits on land) and a mineral processing in Scandinavia where the energy has a relative low CO<sub>2</sub> footprint, the company assumed a carbon intensity of 1t CO<sub>2</sub>/t Cu produced. The company's base case accounts for the yearly production of 81,000t Cu which would generate 81,000t CO<sub>2</sub>. The CO<sub>2</sub> emissions related to the onshore production are repeated in Table 7.

Onshore production – Mineral processing	
Ore processed	1.5Mtpa
Copper grade	6% wt
Copper production	81,000t
CO <sub>2</sub> intensity	1t/t Cu produced
Predicted Emissions	Value
CO <sub>2</sub>	81,000t/year

Table 7: Expected emissions for 2026 and beyond – Onshore Production

<sup>1</sup><https://greenvoyage2050.imo.org/fleet-and-co2-calculator/>

<sup>2</sup><https://www.equinor.com/en/magazine/battery-hybrid-supply-ship.html>

<sup>3</sup><https://www.danfoss.com/en/about-danfoss/news/dps/new-hybrid-vessels-deliver-impressive-20-emission-savings-and-flexible-transport-to-the-wind-farm-industry/>

### Proposed monitoring system

For vessels and as performed in previous sections, the emissions can be calculated from the amount of consumed fuel. The company will monitor the vessel related emissions by collecting the Daily Progress Reports (DPRs) which records the daily use of fuels for every vessel under its direct or indirect control.

In addition, the company will comply with IMO regulations which includes the reporting of the fuel consumption data to the Marine Environment Protection Committee (MPEC) as part of each vessel's SEEMP<sup>5</sup>.

### Aspirational Goals

#### A. Vessels:

The company has produced preliminary figures based on the current practices where most of the exploration and offshore construction vessels are powered using fossil fuels. The company has already started investigating other solutions to mitigate emissions such as:

- The use or mix of carbon free/neutral fuels:
  - green ammonia
  - green hydrogen
  - Biofuel

- Other electrification methods such as hybrid propulsion
- The use of carbon capture technologies to sequester CO<sub>2</sub> as it is produced by marine engines
- The use of less power-demanding assets e.g., unmanned surface vehicles for exploration

#### B. Onshore Production:

The company believes that the mineral processing activities for its products will be similar to those encountered in the Mining Sector. As such the company recognises the rapid pace of change within this industry regarding energy consumption and related emissions. The company believes carbon neutrality can be achieved by 2050 at latest (<https://www.reuters.com/business/sustainable-business/worlds-largest-miners-pledge-net-zero-carbon-emissions-by-2050-2021-10-05/>).

The company intends to enter a partnership with a mineral processing facility which does not allow the company to directly influence the design of the installation and thus the energy consumption by design. Nevertheless, the company will use the intensity of emissions as an evaluation metric for the partner selection process.

<sup>4</sup><https://www.mining.com/pathways-towards-zero-emission-copper-mines-report/#:~:text=Based%20on%20a%20literature%20review,extraction%20methodology%2C%20and%20ore%20grades.>

<sup>5</sup>[https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/278\(70\).pdf](https://www.wcdn.imo.org/localresources/en/OurWork/Environment/Documents/278(70).pdf)

# WATER & EFFLUENTS



## Water and the company's business

Exploration does not involve significant use of water as most of the water consumed and discharged during this activity is related to water consumption for sustaining life at sea (personnel i.e. freshwater) and the cooling of marine engines (seawater). Similarly for Offshore Production, the intended mining system relies on using on-site seawater for both transporting the excavated material from the seabed to the mining vessel and for the cooling of marine engines. Freshwater is used for human consumption at sea and comes either from land (stored in the freshwater tank of the vessel) or produced at sea through desalination process. Water consumption for both Exploration and Offshore Production are expected to be regulated according to IMO rules.

The main water consumer of the company's activities is the Onshore Production where ore mined offshore is processed from a raw material to a metal concentrate that is then sold for further smelting and refining. At present, the company intends to perform the Onshore Production through a partnership with a concentration plant either independent or through an existing mining operation.

Based on existing research activities and the opinion of experts, the company assumes that the SMS ore can be processed using flotation. A summary of the flotation process is given in Figure 2.

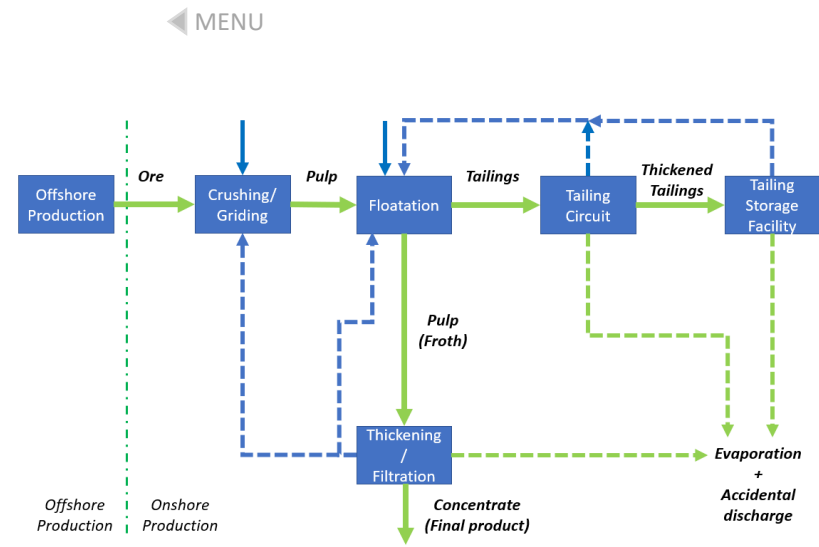


Figure 2: Flotation process. Thick blue arrows represent the input of fresh water. The dashed blue lines represent the water being reclaimed during various stages of the process for re-use. Dashed orange arrows represent water losses due to evaporation and seepage/leakage as well as accidental discharge of residual products.

The process of flotation involves the following steps:

1. **Crushing and grinding:** the ore delivered by the Offshore Production is crushed and added to water to produce a pulp (crushed ore slurry)
2. **Flotation:** the pulp is injected in a cell together with chemical products; air bubbles combined with agitation float the minerals of interest as a froth thus separating them from non-valuable minerals (tailings)
3. **Thickening and Filtration:** the froth produced during flotation is dewatered and filtered to produce a concentrate (residual moisture around 10%) – water is reclaimed and re-injected in the upstream

4. **Tailing circuit:** tailings produced during flotation are filtered and dewatered prior to disposal at the Tailing Storage Facility – water is reclaimed and re-injected in the upstream part of the ore mineral processing chain
5. **Tailing Storage Facility (TSF):** tailings are finally disposed in a dam and subject to sedimentation – overflowing water is reclaimed and re-injected in the upstream part of the ore mineral processing chain

Ideally water can be considered as a closed loop in such mineral process but losses to evaporation are inevitable and are highly depending on the process itself which can vary with the ore composition itself, the desired degree of mineral recovery and the site of the processing plant itself. In addition, some water may be lost due to accidental leakage and seepage at the TSF despite its water-retaining property as per design.

Fresh water input to the mineral processing activities can be achieved by pumping water from river, water catchment or be produced out of seawater through reverse osmosis (desalination). The choice of the fresh water source depends on the location of the mineral processing plant and can be a source of conflict with local communities and biodiversity.

**Onshore Production from 2026**

In the absence of an existing mining study or existing operations, the company used some publicly available information to establish some predictions of its water consumption. According to USGS figures for a copper mineral processing plant which specifications are reproduced in Table 7 along with its expected water balance reproduced in Table 8.

Engineering and operational parameters	Value
Daily plant capacity	50,000t
Operating days per year	350
Annual plant ore capacity	17.5Mt
Copper ore feed grade	0.5%
Annual concentrate production	292,000t
Final concentrate moisture content	10%
Final concentrate copper grade	27%
Tailing deposited in the TSF per year	17.2Mt
Solids contained in tailings slurry	50%

Table 7: Mineral processing plant specification assumed for this document (USGS, 2012)

Type of water use or water loss	Estimated total annual water requirements	Estimated percentage of total annual water requirement	Estimated water losses
Total annual process plant water requirement	44Mt	N/A	N/A
Flotation circuit process water requirement	2.5t/t of ore	N/A	N/A
Water contained in copper concentrate	0.03Mt	< 0.5%	< 1%
Water contained in tailings slurry and deposited in the TSF	17Mt	39%	63%
Water entrained in the TSF	6.9Mt	16%	40%
Water deposited in the TSF attributed to evaporative losses	3.4Mt	8%	20%
Water deposited in the TSF attributed to seepage losses	0.52Mt	1%	3%
Water losses attributed to dust control, evaporative losses from plant flotation cells, and thickeners.	0.17Mt	< 0.5%	< 1%
Water reclaimed from the TSF for process water	6.4Mt	15%	37%
Water acquired from other sources for process water (e.g. water catchment)	11Mt	25%	N/A
Total annual makeup water requirement	17Mt	40%	N/A

Table 8: Water balance for the mineral processing plant assumed in this document

To evaluate the water consumption and losses pertaining to the company's activities, the following information is considered:

- Annual ore delivery to the processing plant: 1.5Mt
- Copper grade average: 6%
- Mineral processing requires a rather steady input and thus the ore delivered by the company will have to be blended with the other ore treated by the processing plant. It is also possible that the higher-grade ore delivered by the company lead towards an increase of the design ore feed grade (0.5% in the assumed case). Company assumes that the water consumption for treated its ore should be equivalent i.e. 2.5t water per tonne of ore:

- Annual process water requirement: 3.75Mt which represents 8.5% of the process plant annual requirements
- Annual freshwater requirements: 0.94Mt
- Annual water disposal (seepage in the TSF): 0.04Mt

In the company's plan only 20% of the annual ore production capacity of the mining system is used in the first two years of the project. Accordingly figures for water consumption and disposal should be reduced for 2026 and 2027. A summary of the forecast water consumption and disposal is provided in Table 9.

Description	Year 2026/2027	Year 2028 onward
Annual freshwater requirements	0.19Mt	0.94Mt
Annual water disposal	0.008Mt	0.04Mt

Table 9: Expected annual freshwater consumption and water disposal

**Proposed monitoring system**

As the company intends to enter a partnership with a concentration plant, the company will rely on the reporting from the concentration plant operator. Nevertheless, and as a minimum, the company expects the concentration plant operator to provide operational data in order to the company to report results as per GRI 303's requirements. The company will also require from its mineral processing partner a regular reporting, monthly as a minimum, in order to allow for the early identification of deviation underlining possible technical issues which must be diligently dealt with.

**Aspirational Goals**

- The company will ensure through his evaluation of partners that mining processing plants are selected based on:
- An efficient water reclaiming process throughout the mineral processing,
  - A freshwater sourcing that is sustainable i.e. from a replenishable catchment and not conflicting with local populations and biodiversity,
  - A minimal amount of unwanted disposal through an efficient TSF design and a satisfactory maintenance program of the mineral processing plant,
  - A comprehensive quality system where

relevant data is collected and systematically analysed for remediation and improvement purposes. In addition to this, and apart from inevitable water loss due to evaporation, the company commits to a zero-target for water disposal due to seepage. This target is also linked to the fact that water that has been used for processing is not readily disposable in the environment as it can be contaminated with chemical and toxic elements.

# WASTE

## Waste and the company's business

Exploration does not involve a significant production of waste as it entails only marine operations and the processing of negligible amount of minerals coming from sampling activities. Waste produced during Exploration are expected to be regulated and reporting according to IMO rules.

As part of Offshore Production, the production of waste can be separated into two classes:

- Waste produced as part of vessel utilisation which is regulated and reported according to IMO rules
- Waste produced as part of the extraction of seabed material which is considered the most significant part of the waste produced during Offshore Production. This document will focus on this waste production for this activity.

As part of Onshore Production, waste is produced by processing the mineral ore from Offshore Production into a concentrate. This waste is referred to as tailings, see Section 3.2. As advised in GRI-306, the reporting of waste should focus on solid waste unless effluents must be integrated within the waste reporting due to either regulatory or industry specific reasons. Tailings includes a large amount of water, but this water is partially lost due to

evaporation and partially re-used as process water. In the absence of an available process flowsheet describing the type and amount of chemical necessary for the floatation process and given that any unwanted loss of process water will be reported in Section 3.2, this section of the document will only report waste as solid material (thus excluding the moisture weight).

A summary of the waste produced by the company's activities is presented in Figure 3.

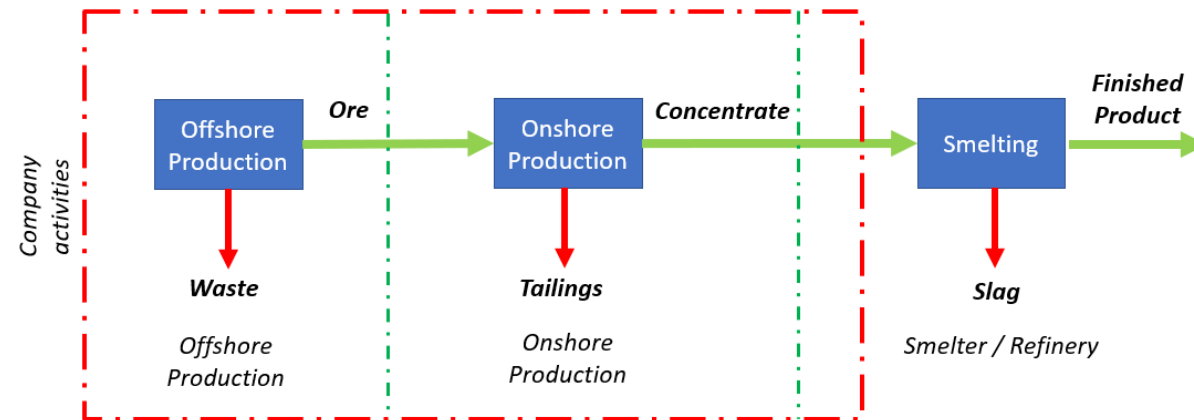


Figure 3: Waste produced by the company's activities. Waste flows are indicated by thick red lines. The activities which are under the control of the company or under the control of its direct partner are delimited by the dashed red box.

Offshore Production from 2026

At the start of the mining operation, some sediments and non-economical material may have to be displaced from the top of the deposit. This material is referred to as overburden. In the absence of a mining study for a real case deposit, the company has considered provisional figures from a similar mining operation (Solwara 1, Nautilus Minerals) where the average overburden was estimated to roughly 10% of the deposit tonnage. In mining operations, some parts of the mineral deposit are excavated but will not be processed because of their metal tenor is below an economical threshold known as cut-off grade. The process of determining the cut-off grade of a mine is complex and requires a dedicated mining study per site. Again, in the absence of a dedicated mining study, the company assumes that the value from previous mining studies for a similar study is relevant. In the case of Solwara 1, all the excavated material apart from the the overburden was qualified as ore i.e. exceeding the defined cut-off grade. A metric for estimating the ratio of produced mining waste and produced ore is the stripping ratio (SR) defined as such:

$$SR = \frac{Waste}{Ore}$$

And thus:

$$Waste = Ore * SR$$

Using the assumptions from Solwara 1 project, i.e.  $SR = 0.1$ :

$$Waste_{year} = Ore_{year} * 0.1$$

During the year 2026 and 2027 only 20% of the annual production is available as only pilot mining is performed. Full-scale production starts in 2028 i.e. 100% of the annual production is available. Using the formulas describe here-above and an annual production rate of 1.5 million tonnes the projected waste production is presented in Table 10.

Description	Year 2026/2027	Year 2028 onward
Annual waste production (Mining)	30,000t	150,000t

Table 10: Expected waste production during Offshore Production

The waste handling strategy of the company is not yet defined as the design of the mining system is not complete and no mining plan has been established for a real project. The company projects two options for the handling of waste:

1. Land storage: all the excavated material is lifted to the mining vessel and further transported to land where the ore and waste can be sorted. In this option, the mining waste are stored in a landfill under the responsibility of the processing plant owner.
2. Subsea storage (Seabed landfill):
  - a. All the excavated material is lifted to the mining vessel, then waste and ore are sorted using characterisation techniques. The waste is then disposed of to the seabed through the vertical transportation system.

- b. Waste and ore are sorted at the seabed and only the ore is lifted to the mining vessel. The waste is then stored on the seabed.

These options offer trade-offs in term of technical complexity, operational efficiency, and amount of impact on terrestrial land mobilised for landfill:

1. Option 1 – Land Storage: technically easier as characterisation is performed on land which is an already well-established technique but has the largest impact in term of terrestrial area mobilisation. In addition, storing mining waste from SMS deposits can lead to environmental challenges such as Acid Mine Drainage (AMD) and thus requires mitigation measure for draining and treating the effluents from the waste dump.
2. Option 2 – Subsea storage: no-impact in terms of terrestrial area mobilisation but is the most technically challenging as underwater characterisation techniques are not well-established. This option may also provide a less significant environmental impact as seawater lessens the potential of AMD.

Onshore Production from 2026

As explained in the Water and Effluents Section, the valuable minerals are extracted from the ore produced in Offshore Production to produce a concentrate. This process generates waste as tailings. Reminding the assumptions of this section, only solid waste is considered as waste. The following describes how the tailings production has been calculated for this document:

- The annual ore production from Offshore Production,  $Ore$
- The grade of the ore,  $grade_{ore}$



- The quantity of copper in the ore,  $Cu_{ore} = Ore * grade_{ore}$
- The recovery factor i.e., the quantity of copper recovered at the end of mineral processing,  $\epsilon_{processing}$
- The quantity of copper recovered from mineral processing,  $Cu_{concentrate} = Cu_{ore} * \epsilon_{processing}$
- The grade of the produced concentrate,  $grade_{concentrate}$
- The quantity of concentrate produced,  $Concentrate = \frac{Cu_{concentrate}}{grade_{concentrate}}$
- The quantity of tailings produced,  $Tailings = Ore - Concentrate$

The assumptions taken for the fixed values and the resulting tailings projections are summarized in table 11.

	Years 2026/2027	Year 2028 onward
Ore production	300,000t	1,500,000t
Ore grade	6 %	6 %
Processing mineral recovery	90 %	90 %
Concentrate grade	27 %	27 %
Concentrate production		
Concentrate	60,000t	300,000t
Copper in concentrate	16,200t	81,000t
Waste production		
Tailings	240,000t	1,200,000t

Table 11: Waste generated during Onshore Production (tailings)

For the years 2026 and 2027, only 20% of the nominal ore production has been accounted for as only Pilot Mining is performed.

**Smelting and refining from 2026**

Even though not controlled by the company it is possible to estimate the amount of indirect waste generated by the use of the company's product, the concentrate produced during Onshore Production, and data from the literature. According to generic data, the waste produced during the smelting process can contain 0.5 to 0.7% of copper and the amount of solid waste per tonne of produced copper does not exceed 3t. The following calculation has been considered for this section:

$$Copper_{concentrate} = Concentrate * grade_{concentrate}$$

$$Copper_{smelter} = Copper_{concentrate} * (1 - 0.07)$$

$$Waste_{smelter} = Copper_{smelter} * 3t$$

Using the figures presented on page 30, Onshore Production from 2026, and the assumptions given in this section, a provisional estimation of future waste production during Smelting and Refining is given in Table 12.

	Years 2026/2027	Year 2028 onward
Concentrate grade	27%	27%
Concentrate production	60,000t	300,000t
Copper loss	0.7%	0.7%
Waste per tonne of copper produced at smelter	3	3
Waste production		
Smelter waste (Slag)	45,198t	225,990t

Table 12: Waste generated during Smelting and Refining (slags)

copper slag has various applications and thus the waste produced during Smelter and Refining can be re-used for applications such as grit blasting, concrete production as a partial

replacement for sand and as a road construction material. Non-reusable slag is assumed to be stored in a landfill.

#### Proposed monitoring system

The waste generated during Offshore Production are intended to be recorded according to the data provided for the operational DPR of the Offshore Mining System.

The waste generated during Onshore Production are intended to be recorded according to the data provided by the mineral processing plant as part of its regular reporting to the company.

The waste generated during Smelting and Refining are intended to be recorded according to the quantity of concentrate delivered to the client smelters and calculated based on the ESG reports of the client smelters.

#### Aspirational Goals

The company intends to favour options for storing waste that are the most sustainable. As an example, the company already considers method for offshore pre-concentration of the offshore produced ore. Pre-concentrated ore would exhibit a higher grade when entering the Onshore Production activity which would be beneficial as it would reduce the amount of tailing produced by the mineral processing plant. From a balance perspective this would increase the quantity of waste produced during Offshore Production and reduce the quantity of waste produced during Onshore

Production. However, the company believes it would be a positive trade-off because Offshore Production's waste are not chemically treated and do not pose any threat to water catchment.

For Onshore Production, company will favour partnering with a mineral processing plant which present a high degree of ESG awareness and which TSF does not conflict with local communities and ecosystem.

For Smelting and Refining, the company will make efforts to discuss with its client smelters in order to ensure produced waste are re-used as much as possible.

For Onshore Production, company will favour partnering with a mineral processing plant which present a high degree of ESG awareness and which TSF does not conflict with local communities and ecosystem.

For Smelting and Refining, the company will make efforts to discuss with its client smelters in order to ensure produced waste are re-used as much as possible.

# BIODIVERSITY



**Biodiversity and the company's business**

As for other extractive industries, the marine minerals industry will entail interactions with various ecosystems and the company endeavours performing its activities in the most sustainable manner. Consequently, the company has a strong focus towards the protection of biodiversity and commits to collaborating with third parties in transparent manner to ensure that its activities do not threaten biodiversity and do not lead to irreversible damages.

As shown on Figure 4, the company intends to apply a precautionary approach to its extraction activities. Since the beginning of exploration, the company intends to acquire environmental and biological data to construct a baseline

which can be used as a reference for its Environmental Impact Assessment (EIA). Then prior to start full-scale production, the company intends to perform test mining which will support the elaboration of an Environmental Monitoring and Mitigation Plan (EMMP) which will describe how the company will monitor environmental deviations from the established baseline and react and mitigate these deviations. The EMMP is expected to be a requirement for the future production permit process as it is already the case in terrestrial mining. The company believes that this precautionary approach is the best guarantee for the protection of biodiversity.

**Expected disclosures**

When in operations, the company commits to disclose information according to the Disclosure 304-Biodiversity which includes:

**Disclosure 304-1** Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas:

Exploration and offshore production will be conducted in offshore licenses which are granted by the local authorities. At present, none of the areas which the company expects to operate in have been classified as protected areas of high biodiversity value. Nevertheless, due to the limited level of scientific knowledge of these areas, the company expects some prospects areas' classification to change in the future and will amend this report accordingly.

As previously mentioned, the company does not intend to own, lease, or manage mineral processing facilities. Nevertheless, the company will report on the location of its mineral processing partners.

**Disclosure 304-2** Significant impacts of activities, products, and services on biodiversity

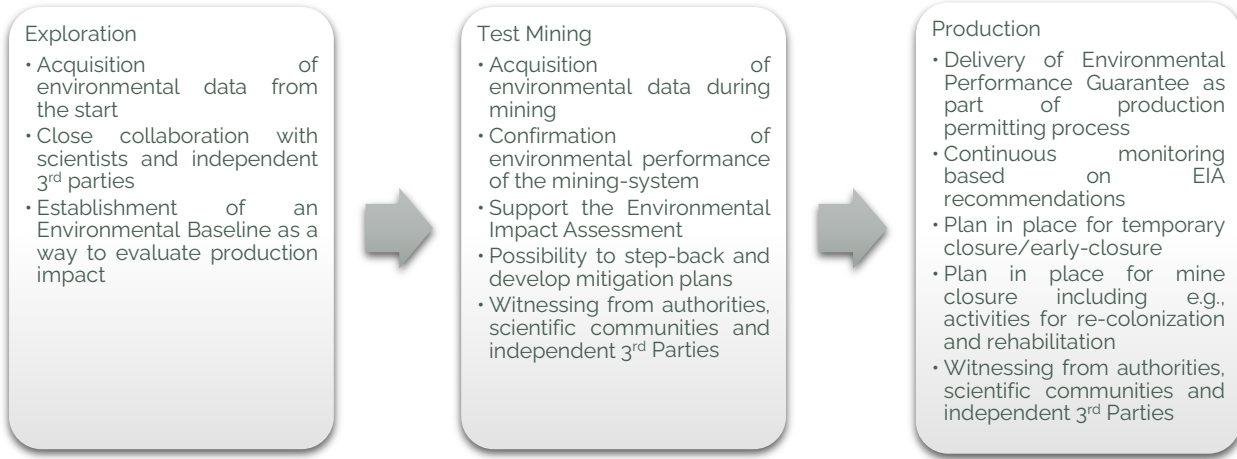
a. Nature of significant direct and indirect impacts on biodiversity with reference to one or more of the following:

i. Construction or use of manufacturing plants, mines, and transport infrastructure;

Typical subsea "mine" concepts do not include the construction or use of local infrastructures as it is found with terrestrial mines. The company does not intend at this stage to construct any processing plant. The company does not currently have any mining site but will report any future mining development.

ii. Pollution (introduction of substances that do not naturally occur in the habitat from point and non-point sources);

Exploration: The company has not identified any operation which would introduce substances that do not naturally occur in the habitat. Especially for the coring and drilling activities, the company does not intend to use reverse circulation techniques involving drilling mud as commonly encountered in the O&G industry.



Offshore Production: The currently considered mining system does not involve the introduction of substances that do not occur naturally from the habitat. For the vertical transportation of the excavated ore, the company's considered design uses local seawater for mixing the ore into a slurry. Following dewatering, the same local seawater is disposed at the seabed following filtration. Potential residuals in form of fine sediments will be minimised and are originating for the seabed where the original ore has been excavated, thus the potential sediment release comes from a natural occurring source. It is possible that similarly to other underwater activities, technical failure of subsea machinery may lead to hydraulic fluid spillage. The amount of such spillage are usually very small and do not lead to major change of water chemistry which could impact the local biodiversity. In addition, underwater machinery design are shifting towards full electrification and thus removes the forementioned oil spillage risks.

Onshore Production: Mineral processing uses chemical products which may be released either through slippage or as part of the tailing disposal process. Even though the company does not plan to own or manage such facilities, the company will report any relevant information related to the release of chemical products from its mineral processing partners.

iii. Introduction of invasive species, pests, and pathogens;

The company has not identified any risks of introducing invasive species, pests or pathogens to the biodiversity presents at the mining site. The environmental conditions of the subsea mining worksite has led to the development of a specific biodiversity which is specialised for surviving into the deep-sea environment. Should marine species be accidentally introduced from the surface equipment, it is unlikely that these individuals would survive the conditions of the deep-sea and present a threat to the deep-sea environment.

iv. Reduction of species;

Exploration: The company does not foresee any risk related to this type of operations.

Offshore Production: The threat of deep-sea mining to the deep-sea biodiversity is the main concern of biologist as per today. Mining involves the destruction of habitat by removal of the living substrate of sessile organisms which could lead to a significant disturbance of the local eco-system. Other

environmental risks involve the production of plumes i.e., clouds of particles, which could drift and threaten current-feeding organisms e.g., crinoids, which dwell in the vicinity of the mining site. The scientific research around plume production and dispersion is an ongoing activity and the company keeps a technological watch on that topic. Finally, the impact of generated plumes will be integrated within the EMMP of the company and will be part of its project development plan and will be monitored during mining as part of its operating procedures. Onshore production: Even though the company does not plan to own or manage such facilities, the company will report any relevant information related to the release of chemical products from its mineral processing partners.

v. Habitat conversion;

The company has not identified any risk of habitat conversion linked to its activities.

vi. Changes in ecological processes outside the natural range of variation (such as salinity or changes in groundwater level).

Exploration and offshore production activities are not foreseen as representing a risk of changes in ecological processes outside the natural range of variation. This will be updated in the future EMMP of the company.

Onshore production: Even though the company does not plan to own or manage such facilities, the company will report any information relevant to that topic.

b. Significant direct and indirect positive and negative impacts with reference to the following:

i. Species affected; The biodiversity of the deep-sea has not been fully mapped and for each potential mining site, the company will complete biological surveys to list the species present at the mining site and at the vicinity of the mining site. The results will be compiled in its environmental baseline reports and integrated in the Environmental Impact Assessment (EIA). These environmental surveys will be performed as part of the company's exploration activities. EIA and subsequent EMMP are necessary elements for the submittal of Project Development Plans to the competent authority and thus necessary for obtaining mining authorisation from the authorities.

- ii. Extent of areas impacted; Outside of the mining site itself, the company will assess the extent of disturbance due to noise and plumes. In addition, the company will assess the risk generated by operational contingency scenarios e.g., the leakage within the vertical transportation system which may release some sediments in the water column. This information will be presented within the company's EMMP as part of its Project Development Plan.
- iii. Duration of impacts; As no deep-sea mining activities have been performed on an industrial scale, it is impossible for the company to assess the time necessary for the mining to partially/fully recovery following the cessation of mining activity. The company will consider ways for rehabilitating the mining sites through e.g., supporting the recolonisation of the mining site by background biodiversity (re-implantation of deep-sea corals).
- iv. Reversibility or irreversibility of the impacts. Because the company does not intend to mine active vent-sites, the company's activities has not been assessed as posing a major threat to unique biodiversity as the one present around black smokers. Nevertheless, the company needs to continue its research activities to ensure that its mining plans mitigates the threat to regular deep-sea biodiversity by e.g., threatening the interconnectivity of sensitive species.

**Disclosure 304-3** Habitats protected or restored: Part of the company EMMP is to present to licensing authorities that its activities either during exploration or production does not present significant harm to the present biodiversity. According to current scientific knowledge, and to protect the common heritage of mankind, provisions are expected within the local regulations to preserve some of the areas as sanctuary where no industrial activities are allowed. In addition to this sanctuary areas, it is possible that the company protects additional habitats within its license portfolio according to EIA and EMMP. Habitats restoration would be considered during mine closure activities by performing activities favourable for recolonisation of the mined area by background biodiversity.

**Disclosure 304-4** IUCN Red List species and national conservation list species with habitats in areas affected by operations: At present, due to lack of scientific knowledge, species inhabiting the sites of possible future mines have not been classified according to the IUCN Red List apart from *Chrysomallon squamiferum*, which has recently been listed as 'Endangered' on the IUCN Red List. The company expects more species to be classified in the future and will update its reporting accordingly.

#### Proposed monitoring system

The company will establish an EIA based on the baseline resulting from its exploration activities. The EIA will identify the areas of concern related to the protection of the biodiversity. Typical areas of concern could be the risk of damaging neighbouring ecosystems e.g. through the production of plumes or the release of toxic elements in the seawater column. Through its EMMP the company will propose monitoring and mitigation action e.g. the monitoring of seawater turbidity near sensitive ecosystems in order to ensure that measurements are always below the acceptable threshold. In turn mitigation can be to change some of the operating parameters of the mining system (reducing the plume) or temporary stop the mining operations due to shifting current patterns (directing the plume to non-sensitive area). The company expects strong reporting requirements from the authorities and will report and environmental deviations as part of its sustainability reporting. In addition, the company will invite independent third parties to ensure transparency during the establishment of its EIA and EMMP. The company believes the sea is the common heritage of the humankind and strongly supports academic endeavours increasing the knowledge of the deep-water ecosystems. As such the company intends to transfer its environmental data to academic and public entities for the purpose of scientific research.

#### Aspirational Goals

The company will enforce a non-tolerance policy when it comes to threatening the biodiversity either on land or in the marine environment. This can be achieved only by abiding to the strongest environmental requirements. The company believes that such requirements will be a standard in its region of operation.

## Environmental Compliance

When in operations, the company commits to disclose information according to the Disclosure 307-Non-compliance with environmental laws and regulations administrative and judicial sanctions for failure to comply with environmental laws and/or regulations, including:

- international declarations, conventions, and treaties;
- national, sub-national, regional, and local regulations;
- voluntary environmental agreements with regulating authorities that are considered binding and developed as a substitute for implementing new regulations;
- cases brought against the organization through the use of international dispute mechanisms or national dispute mechanisms supervised by government authorities;
- cases of non-compliance related to spills as reported with GRI 303 – Water and Effluents and GRI 306: Waste

## Proposed monitoring system

The company will ensure the information concerning environmental compliance is available by implementing the necessary procedures within its Business Management System.

## Supplier Environmental Assessment

The company does not presently have suppliers. In future reporting, the company commits to disclose information according to the:

- Disclosure 308-1 - New suppliers that were screened using environmental criteria by reporting the percentage of new suppliers that were screened using environmental criteria.
- Disclosure 308-2 - Negative environmental impacts in the supply chain and actions taken by reporting:
  - Number of suppliers assessed for environmental impacts.
  - Number of suppliers identified as having significant actual and potential negative environmental impacts.

- Significant actual and potential negative environmental impacts identified in the supply chain.
- Percentage of suppliers identified as having significant actual and potential negative
- Environmental impacts with which improvements were agreed upon as a result of assessment.
- Percentage of suppliers identified as having significant actual and potential negative environmental
- Impacts with which relationships were terminated as a result of assessment, and why.

## Proposed monitoring system

The company will ensure the information concerning its supplier's environmental performance is available by implementing the necessary procedures within its Business Management System. Especially the company will establish a supplier screening procedure, a yearly review of its suppliers' sustainability reports and a comprehensive procedure for the execution and the reporting of audits led at suppliers.

## Aspirational Goals

The company has established the following goals for the screening and monitoring of its suppliers' environmental performance:

- 100 % of new suppliers screened using environmental criteria
- 100 % of ongoing suppliers screened using environmental criteria:
  - o Review of Sustainability report when available
  - o Audits of suppliers when no report is available
  - o Encourage suppliers to produce sustainability report
- 100% transparency by disclosing termination of contracts with suppliers due to negative environmental assessment.

STATEMENT OF USE: Green Minerals has reported in accordance with the GRI Standards for the period from 1 January 2022 to 31 December 2022.

GRI 1 USED: GRI 1: Foundation 2021

APPLICABLE GRI SECTOR STANDARD: Applicable GRI Sector Standard not available

**GRI 2: GENERAL DISCLOSURES 2021**

GRI DISCLOSURE	CONTENT INDICATOR	LOCATION
2-1	Organizational details	About Green Minerals - Page 05
2-2	Entities included in the organization's sustainability reporting	DO NOT APPLY
2-3	Reporting period, frequency and contact point	About this report - Page 03
2-4	Restatements of information	DO NOT APPLY
2-5	External assurance	About this report - Page 03
2-6	Activities, value chain and other business relationships	Activities: About Green Minerals - page 05 Value chain: Our vision: creating the value chain of marine minerals - page 11,12,13,14
2-7	Employees	Our people - Pages 15
2-8	Workers who are not employees	Our people - Page 15
2-9	Governance structure and composition	Governance - Page 17
2-10	Nomination and selection of the highest governance body	Governance - Page 17
2-11	Chair of the highest governance body	Governance - Page 17
2-12	Role of the highest governance body in overseeing the management of impacts	Governance - Page 17
2-13	Delegation of responsibility for managing impacts	Governance - Page 17
2-14	Role of the highest governance body in sustainability reporting	Governance - Page 17
2-15	Conflicts of interest	Governance - Page 18
2-16	Communication of critical concerns	Governance - Page 18
2-17	Collective knowledge of the highest governance body	NOT DEFINED - TO BE INFORMED
2-18	Evaluation of the performance of the highest governance body	The company has not yet performed an evaluation. The process will be described in future report.
2-19	Remuneration policies	Governance - Page 18
2-20	Process to determine remuneration	Governance - Page 18
2-22	Statement on sustainable development strategy	Sustainable development - Page 07
2-23	Policy commitments	Policy commitments - Page 19
2-24	Embedding policy commitments	Page 19 - Other processes related to embedding policy commitments will be developed and informed
2-25	Processes to remediate negative impacts	Policy commitments - Page 20
2-26	Mechanisms for seeking advice and raising concerns	Policy commitments - Page 20
2-27	Compliance with laws and regulations	No non-compliance with laws and regulations during the reporting period
2-28	Membership associations	No membership associations
2-29	Approach to stakeholder engagement	Stakeholders - Page 10
2-30	Collective bargaining agreements	

**GRI 3: MATERIAL TOPICS 2021**

3-1	Process to determine material topics	Material topics - page 21
3-2	List of material topics	Material topics - page 21
3-3	Management of material topics	From page 22 to page 39