



## Overview of seabed minerals

**This fact sheet explains the background to seabed minerals in the Cook Islands and how we will manage seabed minerals activities in our waters.**

### **What are seabed minerals?**

Seabed minerals are found on the ocean floors, including the seabed of the Cook Islands. The minerals of commercial interest in the Cook Islands are known as “polymetallic nodules” They are spherical (like a golf ball) to potato-shaped rocks, and are generally found on the seafloor at depths of 3,000-6,000 metres. They are called “polymetallic” because they contain several metal elements.

The Cook Islands nodules contain a number of strategic elements, including the target metal cobalt (used in rechargeable batteries and other industrial, high-tech, medical and military applications), as well as by-product metals also sought by extractive industries such as: nickel, copper, manganese, niobium, zirconium and rare earth elements.

### **How much of these resources are at the bottom of the sea?**

An estimate for nodules within the Cook Islands’ exclusive economic zone (EEZ) is that there are some 12 billion wet tonnes. This is generally considered the second largest deposit of metal-rich nodules.

Nodules do exist elsewhere in the world’s oceans, including the Clarion-Clipperton Fracture Zone in the Pacific Ocean, but these nodules are different in composition to the Cook Islands nodules – with lower cobalt but higher nickel and copper content. Cook Islands nodules are also found in greater abundances, sometimes up to 30kg/m<sup>2</sup>.

This doesn’t mean that all the Cook Islands nodules will be extracted. Only a relatively small proportion can be.

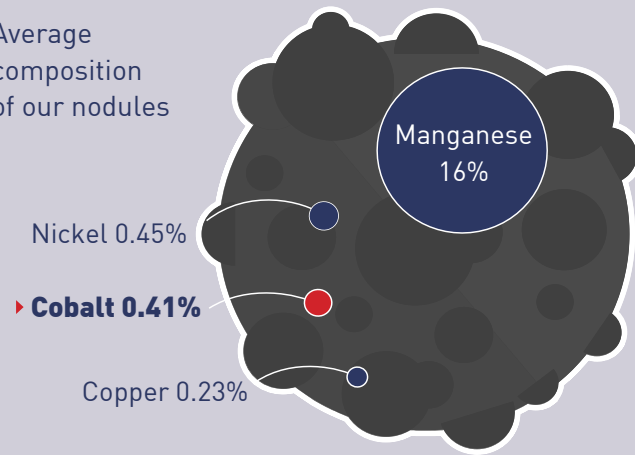
### **Who owns our seabed minerals?**

International law gives what are called “sovereign rights” to nations over the natural resources in their EEZs. This means countries can exclusively explore for and exploit their natural resources subject to certain international obligations like the protection of the marine environment.

In the Cook Islands these rights are held by the Crown and managed by the Authority through the Seabed Minerals Act 2019.

## COBALT, THE TARGET MINERAL FOR COOK ISLANDS

Average composition of our nodules



## Why extract nodules from the deep-sea?

We have a rapidly increasing global population. They are seeking a higher standard of living. This trend can only be supported through far more advanced clean technologies, including transportation and renewable energies, to keep our planet sustainable.

Metals like cobalt, nickel and manganese will be key to enabling this transformation. We can already see a rapidly growing demand for electric cars and this will place enormous pressure on nickel, manganese and cobalt, all of which are used in rechargeable lithium ion batteries.

Land-based sources for these metals are becoming more difficult to extract with increasing amounts of energy and water needed to recover them with corresponding impacts on the environment and our climate. Mineral resourcing and climate change are inextricably linked.

The social impacts of some land-based mining are increasingly controversial: child labour practices and human rights abuses are not uncommon in several resource-rich countries.

This has led to an increasing interest in offshore deposits, where homes and communities will not be disrupted, and supply chains can be governed in ways that are more responsible, accountable and transparent.

There are also economic drivers: deep seabed resources are believed to contain a higher concentration, and a higher number of different types, of valuable minerals in one deposit than their terrestrial alternatives.

## Can't metals be recycled?

They can and metal recycling and technological change will contribute to sustaining supply. However, extracting metals must continue and grow for the foreseeable future to ensure sufficient supplies to drive our transition to a cleaner future.

At some point in the future there will be a greater recycling of metals as we transition to a circular economy to address metal supply constraints. But for the near-term new supplies of metals are needed to resolve the challenges of clean energy and transportation.

## What is meant by "seabed minerals activities"?

Seabed minerals activities involves two main stages. Stage one involves exploration, and stage two the extraction of the nodules from the seabed. Comprehensive exploration must take place before any commercial extraction can be approved, including our understanding of the marine environment at these depths.

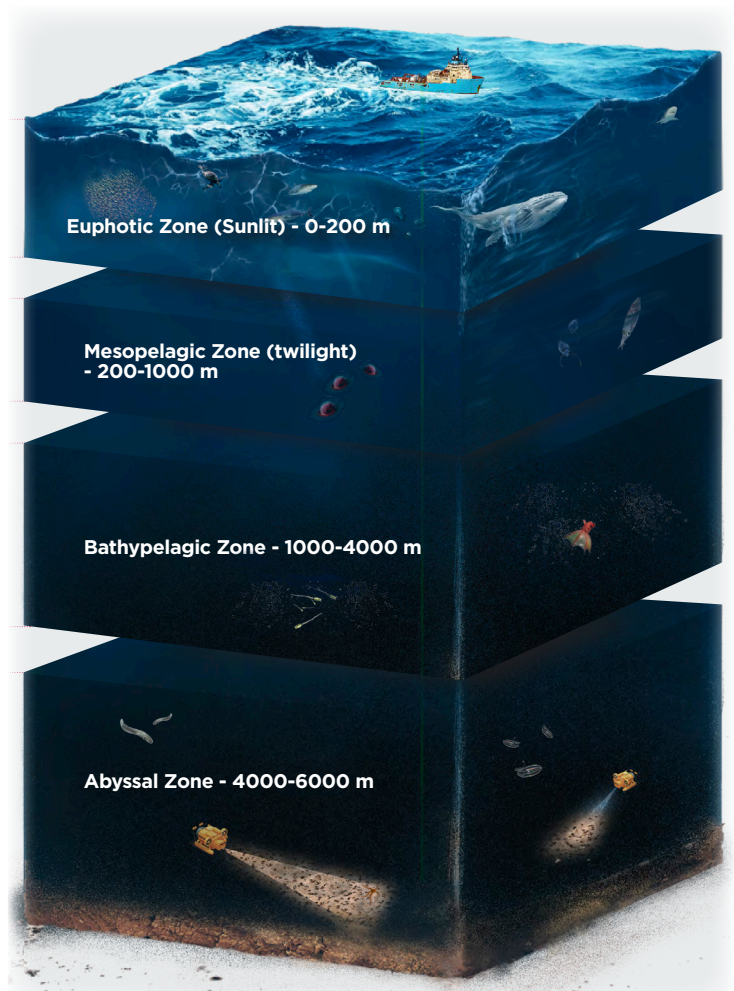
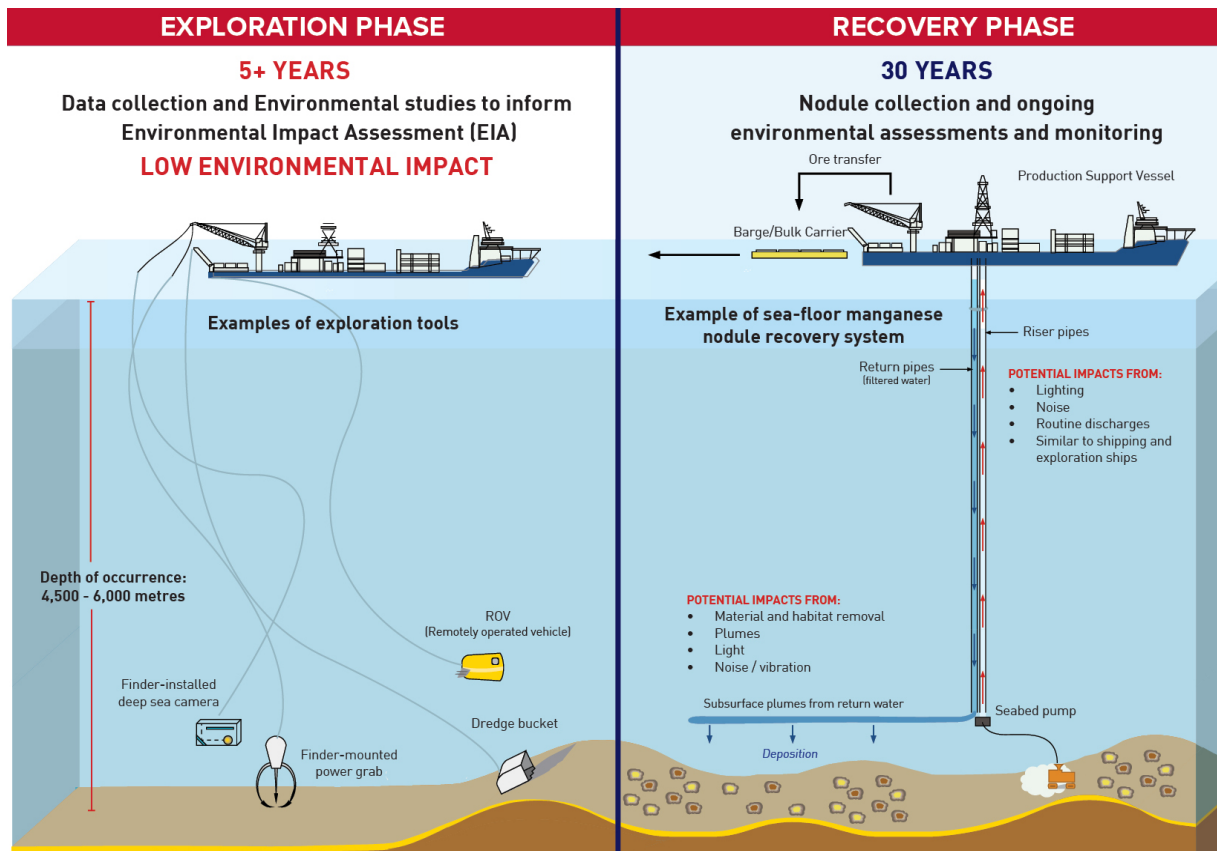


image courtesy of DeepGreen



### What happens in “exploration”?

Exploration is a very important first step involving research and gathering information and data. It will include:

- Assessing the quality and grade of the nodules, and the possibility for their commercial extraction
- Collecting environmental baseline data, identifying risk factors and conducting environmental impact assessment for future extraction operations
- Monitoring any impacts of exploration on the marine environment

Exploration will provide the Cook Islands with critical data and information not only in connection with seabed minerals activities but also to gain a better understanding of our Marae Moana and to better informed decision-making.

### What happens in “extraction”?

The extraction of minerals from the seabed is not completely new. Humankind has been extracting or dredging materials from the seabed for decades. However, the potential extraction of seabed minerals at the anticipated scale and depth is a new industry, with the technology to extract nodules still under development and testing. However, advances in extraction technology are promising but full-scale commercial extraction at these greater depths has yet to be proven.

One form of technology involves the use of a collector moving across the seabed to recover the nodules and hydraulic suction to carry sediment and the nodules to a

surface vessel. Another, a bucket system operating like a conveyer belt running from the seabed to the surface vessel.

Some processing will occur on the surface vessel involving the discharge of the seawater back to the ocean at an agreed depth.

During extraction operations, the marine environment will be continually monitored, with reporting back to Crown agencies to make sure that the licence holder is in compliance with the conditions of its licence, including environmental quality standards and objectives.

### Who can explore for or extract our nodules?

Only operators that hold a licence with the Authority can explore or extract nodules in the EEZ. Potential operators must apply to the Authority for a licence and have to demonstrate that they have the skills, financial resources and show a good compliance record before a licence is granted. Applying for a licence is a multi-step process. We have prepared a separate information sheet on the licensing process.



## What considerations have been given to the protection of our marine environment?

The Government has expressed its commitment to ensure that seabed minerals activities do not cause serious harm to the marine environment.

The Environment Act 2003 and the associated regulations will set the legal framework for the environmental management of seabed minerals activities.

These legislative instruments, as well as the Seabed Minerals Act and the Marae Moana Act, all require the application of the precautionary approach to seabed minerals activities.

Most marine biodiversity is located in Euphotic zone (0-200m below the sea), with seabed minerals activities taking place in the Abyssal zone (4,000-6,000m below the sea). See image. Further research will be required to better understand the interaction between the various zones.

Of importance is the need to protect representative areas of habitat and biodiversity of the type that will be subject to or potentially affected by seabed minerals extraction operations.

Such areas should be protected at a scale sufficient to constitute a baseline environment against which the impact of mineral recovery can be assessed and appropriate mitigation measures determined.

Most exploration operations will be similar to research activities and have a relatively low impact on the marine environment.

## How are seabed minerals activities regulated?

Multiple government departments and Crown agencies share the responsibility for managing seabed minerals activities in our EEZ. The Authority is the lead agency. We have prepared a separate information sheet explaining the different roles of the various agencies.

## Is an environmental approval required?

Yes, seabed minerals activities require approval from the National Environment Council. If an exploration or mining licence is granted, certain activities cannot start until an environmental approval is issued by the Council.

Activities under an exploration licence will require the prior consent of the Council.

Any activities that are likely to have a significant environmental impact, for example the large-scale testing of

equipment or extraction under a mining licence will need a project permit. To apply for a project permit a licence holder must prepare and submit an environmental impact assessment report which will be subject to public consultation.

An environmental approval may also have conditions attached to it such as monitoring and reporting conditions.

While a licence issued by the Authority gives access to the EEZ and the seabed minerals, the licence holder must have an approval from the Council to undertake the seabed minerals activities.

## Can seabed mineral activities take place within our Marae Moana?

Yes, seabed minerals activities can take place within Marae Moana as long as it is in line with the Marae Moana principles. In particular, the Authority must ensure that seabed minerals activities apply the principles of ecologically sustainable use. Ecologically sustainable use means conserving, using, enhancing, and developing the resources of the Marae Moana to enable people to provide for their social, economic, and cultural wellbeing, while—

- maintaining the potential of those resources to meet future generations needs
- avoiding, remedying, or mitigating any adverse effects of the use of those resources on the environment of the Marae Moana.

## How do I get involved?

The development of our seabed minerals sector is for the benefit of all Cook Islanders, current and future generations.

You will have the opportunity to make comments on licence application and environmental impact assessments as part of the regulatory process.

The Advisory Committee is also available to provide the Authority with community perspectives on this sector.

Licence holders will also be required to consult with the Cook Islands community. This will provide an opportunity to learn about the work they are doing, and to understand how that work impacts the marine environment.

Opportunities will also exist for training programmes for Cook Islanders as well as future employment opportunities.

## Where can I find out more information?

Please visit the Authority's website and join our Facebook page.



Visit [www.sbma.gov.ck](http://www.sbma.gov.ck)