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NAURU OCEAN RESOURCES INC.

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SCOPING DOCUMENT FOR A SOCIAL IMPACT ASSESESSMENT FOR THE NORI-D POLYMETALLIC NODULE COLLECTION PROJECT

Prepared for Nauru Ocean Resources Inc. by Prizma LLC
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List of Abbreviations

AfDB	African Development Bank
ABNJ	Areas Beyond National Jurisdiction
APEI	Areas of Particular Environmental Interest
Area	Areas Beyond National Jurisdiction
BGR	Germany's Federal Institute for Geosciences and Natural Resources
CAPEX	Capital Expenditure
CCZ	Clarion Clipperton Zone
CHH	Common Heritage of Humankind
CE	Cumulative effects
DLBPS	Developing Land-Based Producer States
DSM	Deep-sea mining
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ESG	Environmental, social and governance
ESIA	Environmental and Social Impact Assessment
FPIC	Free, Prior, and Informed Consent
GHG	Greenhouse gas emissions
GIIP	Good International Industry Practice
GSR	Global Sea Mineral Resources
GWP	Global Warming Potential
IEA	International Energy Agency
IFC	International Finance Corporation
IMO	International Maritime Organisation
ISA	International Seabed Authority
kg	Kilogram
ktpa	Kilotonnes (metric) per annum
LBM	Land-based mining
LTIFR	Lost time injury frequency rate
m^2	Square meter
Mtpa	Million tonnes (metric) per annum
MARPOL	International Convention for the Prevention of Pollution from Ships

Nauru	Republic of Nauru
NORI	Nauru Ocean Resources Incorporated
NORI-D	Nauru Ocean Resources Inc Contract Area D
NSMA	Nauru Seabed Minerals Authority
OECD	Organisation for Economic Co-operation and Development
OEMMR	Office of Environmental Management and Mineral Resources
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PCDP	Public consultation and disclosure plan (Stakeholder Engagement Plan)
Prizma	Prizma LLC (Limited Liability Company)
PRZ	Preservation reference zones
PS	IFC Performance Standards
PSIDS	Pacific Small Island Developing States
REMP	Regional environmental management plan
RKEF	Rotary Kiln-Electric Furnace
SDG	Sustainable Development Goals
SIA	Social Impact Assessment
SIDS	Small Island Developing States
TCFD	Task Force for Climate-related Financial Disclosure
TMC	The Metals Company
TOR	Terms of Reference
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNSDG	UN Sustainable Development Goals
VC	Valued component

I. About this Document

The purpose of this Scoping Document is threefold:

1. Inform stakeholders about the planned NORI-D Polymetallic Nodule Collection Project (the Project).
2. Solicit stakeholders' input in designing the Terms of Reference (TOR) for the Project's planned Social Impact Assessment (SIA) study.
3. Demonstrate that the Project has engaged with stakeholders to consider and incorporate their perceptions, expectations, and concerns into the Project's SIA process.

The Project is applying a conventional and phased social impact assessment process. A simplified concept diagram of the process for the ***SIA Scoping*** *phase* is depicted below. This document is drafted to support the SIA *Scoping* phase as depicted in Figure 1.

Figure 1: Conceptual SIA Scoping process used for the NORI-D Project

Source: Prizma, SIA - Social Impact Assessment, TOR – Terms of Reference

Scoping is the process of identifying and prioritizing the key areas of focus which will need to be investigated in a subsequent impact assessment[1]. Scoping helps focus impact assessments on the potentially significant positive and/or negative effects that should be considered by the decision maker when determining whether or not to approve a project, and in determining what conditions to apply to any approval.

This Scoping document is expected to be published in December 2022. A series of virtual and in-person engagements and consultation activities are being planned and will be announced. Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[2], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

Following the close of the scoping consultation period, feedback will be considered to inform the TOR for the subsequent SIA that will be undertaken by Prizma. The summary Record of Scoping and the TOR will be produced and published.

[1] IAIA, 2018. Fastips on Scoping, No 18, November 2018

[2] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

The SIA will also be subject to public consultation. The outcome of the SIA will be integrated into an EIS, which is required by the ISA as part of NORI's exploitation application for the Project.

As outlined in ISA's Template Table of Contents for an EIS, the Project's planned SIA will describe the obligation, goals, nature, methods, extent and outcome of disclosure and consultation activities with interested and potentially affected stakeholders. A summary of the stakeholders' key concerns and comments, and how these will be addressed, will also be provided. In addition, plans for continuation of the consultation process will be outlined.

NORI plans to submit its application for an exploitation contract for the NORI-D Project in H2 2023. This will also require the submission of an EIS to the ISA for approval. This will include the key findings of the SIA.

This document was generated by Prizma LLC (Prizma)[3] on behalf of Nauru Ocean Resources Incorporated (NORI[4]), a wholly owned subsidiary of The Metals Company (TMC[5]).

II. NORI & The Metals Company

A. NORI

NORI, which is developing the NORI-D Project, is a company registered in and sponsored by the Republic of Nauru, an island state. NORI was established in 2010 and is wholly owned by TMC. NORI is supported by TMC's experienced team of executives, senior management, and members of its board of directors.

Selected TMC team members are introduced below.

- **Mr. Grant Lindner** serves as Project Director for NORI-D. He brings extensive experience in delivering complex resource projects in the construction and mining industries and has delivered over $26 billion in project value during his 25-year career at leading engineering and construction group, Bechtel, and mining major, BHP. He has held senior executive roles for large-scale mining, smelter and refinery, material handling and marine projects, and has a record of building high-performing teams to ensure efficient project delivery.
- **Dr. Gregory Stone** serves as the Chief Ocean Scientist. He has authored hundreds of publications including in Nature and National Geographic, and published four books. Dr. Stone's accolades and professional associations include the Explorers Club, Pew Fellowship for Marine Conservation, National Geographic Hero, the US National Science Foundation/Navy Antarctic Service medal. From 2008 to 2018, he served as Chief Scientist for Conservation International and head of the Global Ocean Program.
- **Ms. Erica Ocampo** serves as Chief Sustainability Officer. Previously, she led the development of company-wide sustainability strategy at Sims Limited, a global leader in metal recycling and electronics recovery, and spearheaded sustainability projects across various business units at

[3] https://prizmasolutions.com/
[4] https://metals.co/nori
[5] https://metals.co/

DOW with focus on circular economy, climate change; and ESG standards, performance metrics, and reporting.

- **Dr. Michael Clarke** serves as Environmental Program Manager with over 25 years of experience in the field of environmental management and impact assessment. He is a certified Environmental Practitioner and Environmental Impact Assessor, and successfully delivered complex EIAs for large infrastructure projects around the world. As a marine biologist, he has also been involved in marine conservation programs and baseline studies in Egypt, Indonesia, Vanuatu, and Australia.
- **Mr. Corey McLachlan** serves as Head of Stakeholder Engagement. He is an experienced community and social performance manager with experience in South Pacific and the Canadian North. Mr. McLachlan started his career in government before joining Rio Tinto, leading their community relations team at the Diavik Diamond.
- **Mr. Jon Machin** is Head of Offshore Development and has 30 years of experience at the forefront of subsea engineering and technology, including in the deep-water sector. His experience includes designing and building remotely operated vehicles engaged in trenching for pipelines and cable laying, and deep-water dredgers. He holds numerous patents, published over 20 peer reviewed papers, and lectured widely on deep-water engineering.
- **Dr. Jeffrey Donald** is Head of Onshore Development with over 20 years of experience in mining and metallurgical business. This includes complex greenfield development, major expansions, environmental improvement and compliance, and commercialization of novel technologies. Previously, he worked with Hatch, INCO, Vale, and SNC Lavalin.

B. The Metals Company

TMC is a deep-sea minerals exploration company focused on the future collection, processing, and refining of polymetallic nodules (PMN) found on the seafloor in international waters of the Clarion Clipperton Zone (CCZ) in the Pacific Ocean. The company's common shares and public warrants are trading on the Nasdaq Global Select Market (Nasdaq) under the symbols "TMC" and "TMCWW". TMC holds exclusive exploration and commercial rights to three polymetallic nodule contract areas in the CCZ through its subsidiaries NORI and Tonga Offshore Mining Limited (TOML), sponsored by Nauru and the Kingdom of Tonga (Tonga, and island state), respectively, and exclusive commercial rights through TMC's subsidiary, DeepGreen Engineering Pte. Ltd.'s (DGE) contract with Marawa Research and Exploration Limited (Marawa), a company owned and sponsored by the Republic of Kiribati (Kiribati, also an island state). Additional information about TMC can be accessed here: https://metals.co/

III. Project Description

A. General Project Location

NORI plans to collect (also referred to as "mining," "exploitation" or "harvesting") polymetallic nodules (PMN) from the abyssal plains (seafloor at over 4,000 meters depth) within the Clarion Clipperton Zone (CCZ). These nodules are discrete rocks that sit unattached to the seafloor, occurring in significant quantities in the CCZ, and containing high concentrations of nickel, manganese, cobalt, and copper in a single rock.

The CCZ is located between Hawaii and Mexico in the Pacific Ocean – it is a geological submarine fracture zone of abyssal plains and other formations. The CCZ has a length of around 7,240 km and spans approximately 4,500,000 km^2. This means that the CCZ is approximately as wide as the continental United States, and its area represents approximately 1.2 percent of the global seafloor.

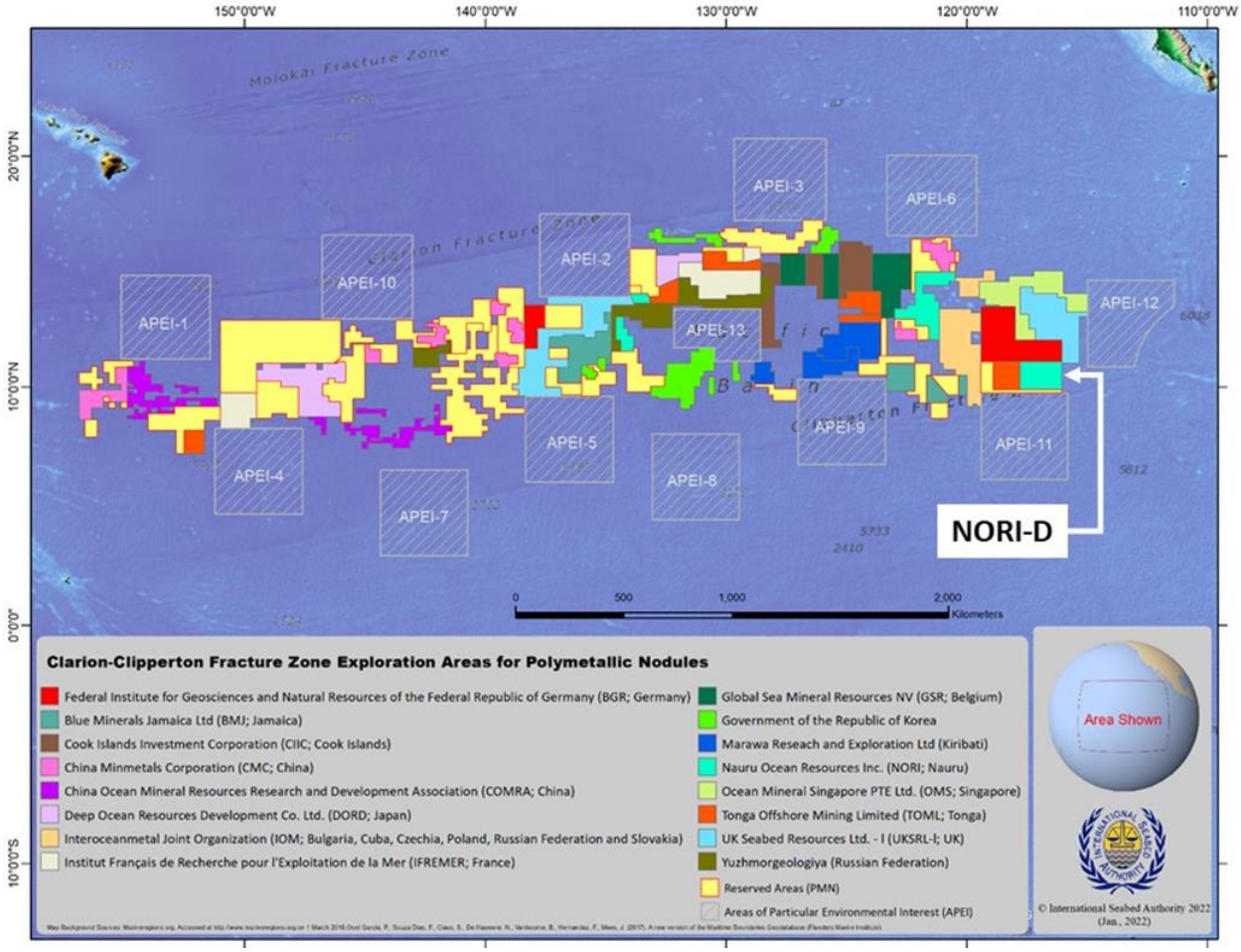
The CCZ features numerous exploration blocks, which are depicted in Figure 3. Other features include "Reserved Areas" (colored in yellow), which are available exclusively for developing countries. The map also identifies a series of protected areas designated "Areas of Particular Environmental Interests" (APEIs). These are intended to protect representative seafloor areas[6], are closed to mining, and intended to safeguard seafloor biodiversity and ecosystem functions across the region.

By December 2021, a total of 13 APEIs were designated pursuant to the ISA's Regional Environmental Management Plan for the CCZ[7], representing 1.97 million km^2 of protected seabed. This means that approximately 43% of the CCZ is protected.

The nearest protected area outside of the CCZ is Clarion Island, located at a distance of approximately 700 km from the NORI-D Project. The island is part of Mexico's *Archipiélago de Revillagigedo*, a designated UNESCO World Heritage Site[8]. It includes four islands, features two naval bases, but is otherwise uninhabited.

[6] https://isa.org.jm/node/20452
[7] https://www.isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone (accessed 4/19/2022)
[8] https://whc.unesco.org/en/list/1510/

Figure 2: Exploration blocks, reserved and 'no mining' (APEI) areas in the CCZ



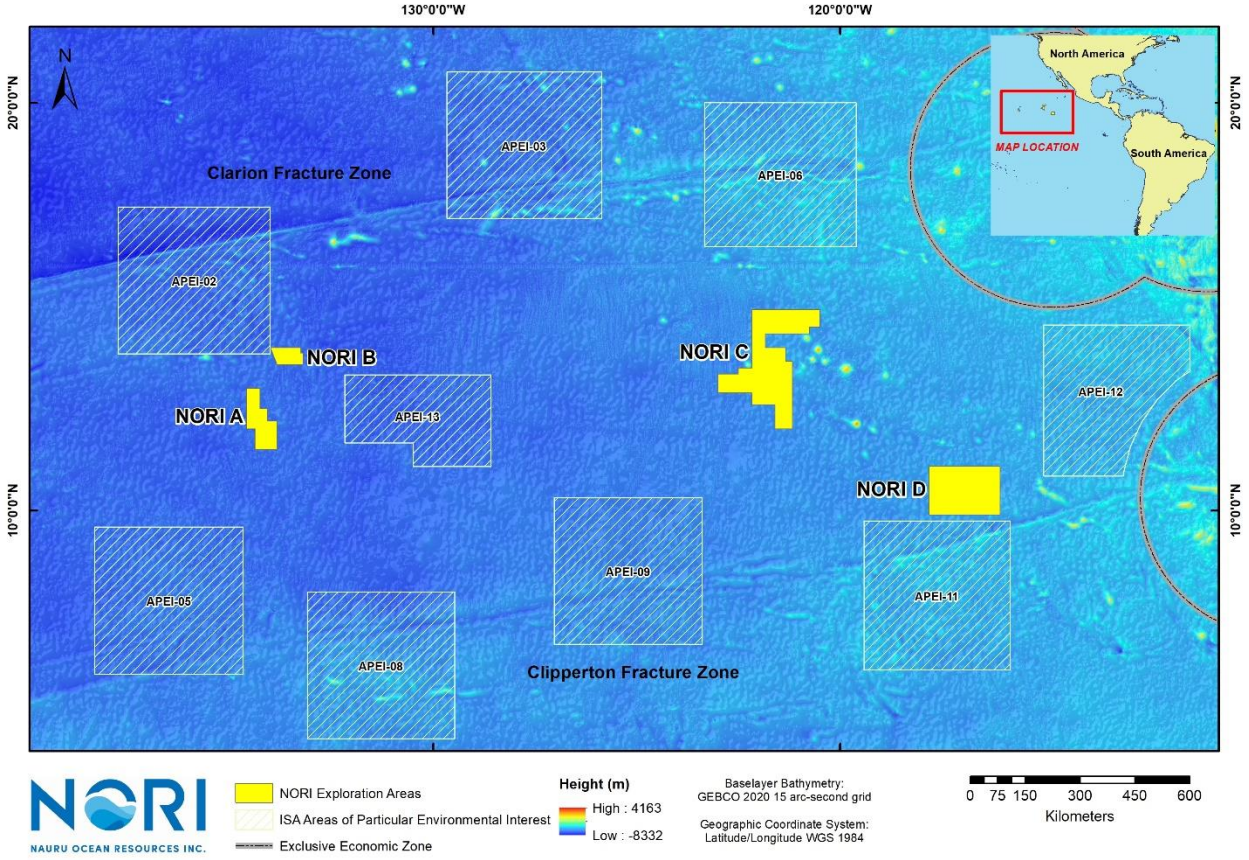
Source: ISA at https://www.isa.org.jm/index.php/map/nauru-ocean-resources-inc (accessed 26/3/2022). APEI - Areas of Particular Environmental Interest represent 1.97 million km^2 of protected seafloor set aside by the ISA pursuant to regional environmental management plans.

B. The NORI-D Project

In July 2011, NORI was granted a 15-year PMN exploration contract by the International Seabed Authority (ISA), which is described further in the regulatory section of this Scoping Document. NORI's contract areas within the CCZ – including the NORI-D Project– are identified in Figure 3.

In 2022, the NORI contract area was ranked by Mining.com as having the world's largest undeveloped nickel resource. The NORI-D Project involves a long-life PMN collection development. NORI-D is expected to be the first project to apply to commercially collect deep-sea polymetallic nodules in international waters which is subject to ISA's regulatory regime, and that of NORI's sponsoring State, Nauru.

Figure 3: Location of NORI's contract areas (yellow) and APEIs (shaded) within the CCZ



Source: NORI using shape files from ISA, APEI – Areas of Particular Environmental Interest

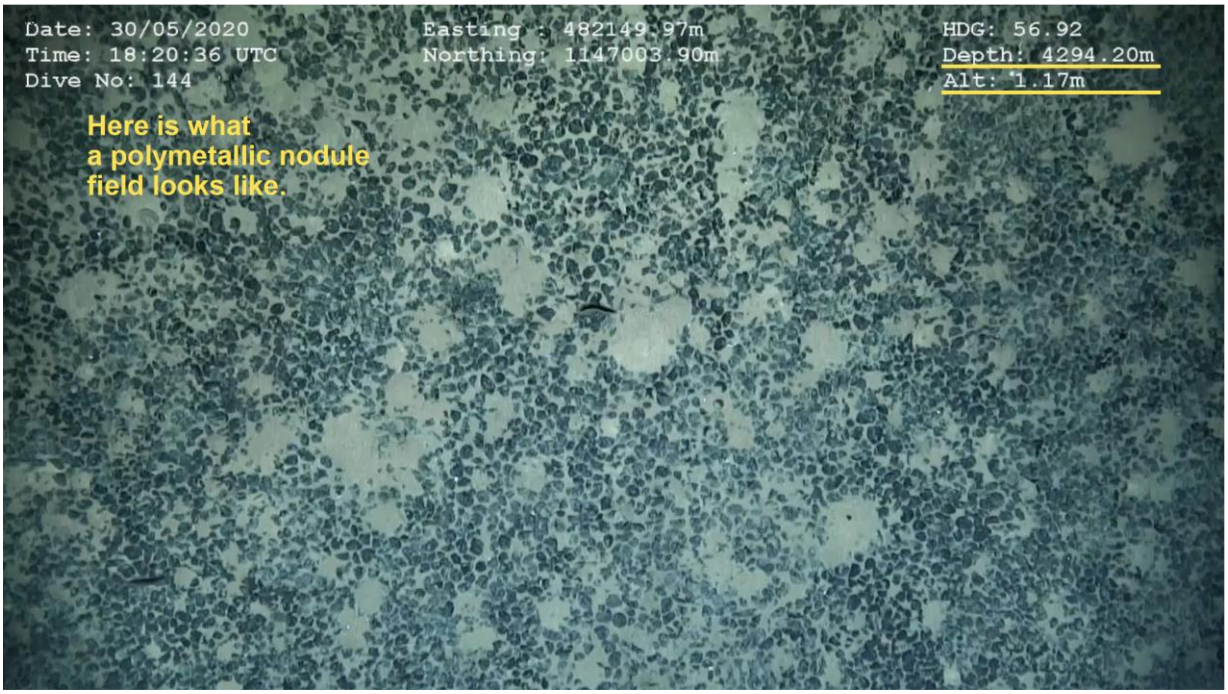
Table 1: NORI 2020 Mineral Resource estimate for NORI-D at 4 kg/m^2 abundance cut-off

Resource Category	Tonnes (Mt, wet)	Abundance (wet kg/m^2)	Nickel (%)	Copper (%)	Cobalt (%)	Manganese (%)	Silicon (%)
Measured	4	18.6	1.42	1.16	0.13	32.2	5.13
Indicated	341	17.1	1.40	1.14	0.14	31.2	5.46
Measured + Indicated	345	17.1	1.40	0.14	0.14	31.2	5.46
Inferred	11	15.6	1.38	0.12	0.12	31.0	5.50

Source: AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clipperton Zone, Deep Green Metals Inc., March 2021. Note: Tonnes are quoted on a wet basis and grades are quoted on a dry basis. Moisture content estimated at 24% w/w. Estimates presented on an undiluted basis without adjustment for resource recovery.

The resource estimate for NORI-D is presented in Image 1 below. The high-grade polymetallic nodules contain nickel, cobalt, copper and manganese, metals commonly used for Li-ion battery cathodes as well as other uses, such as electric wiring and steel making. The typically oblate nodules, ranging on average from 3-4 cm, are distributed, unattached on the generally muddy seafloor of the abyssal plain at a depth of over 4,000 meters below sea level within the CCZ in the Pacific Ocean (see Image 1). The CCZ abyssal plains are common habitats, which feature some of the lowest biomass on earth[9].

Image 1: Polymetallic nodules, on average 3-4 cm in size, laying unattached on the seafloor of the abyssal planes at over 4,000 meters depths



[9] Paulikas, D. et. al., (2020). Where should Metals for the Green Transition Come From? https://metals.co/download/237815/?tmstv=1668033071 page 110-112

Source: TMC

C. Phased Development

NORI proposes to implement the project in phases which allows for the ramp-up of nodule collection capacity as information is collected in the field and confidence in the technical and environmental performance of the system improves over time. This 'Adaptive Management' approach to the implementation of the commercial phase of nodule collection is considered best practice for a nascent industry with a relatively short history[10]. Phased development coupled with an adaptive approach to environmental management will provide learnings at small-scale which will be applied to support increases in scale of the development.

The NORI-D Project involves the following inter-related phased developments, as summarized further below:

1. Collector Test (sea trials completed)
2. Project Zero
3. Project One

The Project description used for this SIA Document, the SIA study, and subject to ISA approval, includes Project Zero and Project One, described further below. For additional context, outcomes of the Collector Test (expected to be completed in Q4/2022) are also summarized below.

1. Collector Test

Following ISA recommendation to commence testing, NORI and offshore partner Allseas commenced the Collector Test in September 2022. Following initial pilot system commissioning tests, a dedicated team of 130 crew and engineers aboard the Hidden Gem conducted a series of production runs in the NORI-D test area. Driving the pilot nodule collector over 80 kilometers, Allseas engineers put the system through a series of tests achieving a sustained production rate of 86.4 tonnes per hour. Approximately 4,500 tonnes of PMN were collected during the test, of which over 3,000 tonnes were transported to the surface production vessel, Hidden Gem, while the additional 1,500 tonnes of nodules were purposely left behind on the seafloor as part of the trials. The pilot system is expected to be scaled up to include additional collector heads and a wider diameter riser pipe in preparation for NORI's Project Zero.

Concurrently, aboard a dedicated monitoring vessel, marine experts and academic scientists conducted the first monitoring program of an integrated pilot collector system test. Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs) were used to survey, monitor and sample the sediment plumes generated by collector operations on the seafloor as well as the mid-water discharge of water from the riser system used to transport nodules from seafloor to the Hidden Gem. Over 40 subsea sensors on seafloor landers and mid-water moorings were deployed to continually monitor sediment plumes and noise generated by the nodule collection operations. The ongoing monitoring program will continue to survey environmental impacts and collect scientific data after the conclusion of the collector system test.

[10] https://www.sciencedirect.com/science/article/abs/pii/S0959652622001305

A short video showing selected elements of the collector test can be accessed here: https://www.globenewswire.com/NewsRoom/AttachmentNg/453aa06e-2539-4e43-a8f9-36c837e78cd0.

The Environmental Impact Statement and Environmental Management and Monitoring Plan, as well as related stakeholder comments received for the Collector Test can be accessed at https://www.metals.co/nori.

2. Project Zero

The pilot collector system (as described in the NORI-D EIS (NORI, 2022)) will be upgraded into a first commercial production system and commissioned for commercial operation in the NORI-D contract area. This first phase of the NORI-D commercial development is referred to as Project Zero.

On March 16, 2022 NORI and Allseas entered into a non-binding term sheet for the development and operation of a commercial nodule collection system. The plans envision the pilot system to be upgraded to produce a sufficient and continuous quantity of nodules to support a commercial operation of about 1.3 Mtpa (wet) nodules delivered to an onshore facility.

Project Zero is characterized as a commercial, continuous operation with the following primary objectives:

- Small-scale commercial production is necessary to demonstrate the feasibility and effectiveness of the proposed mitigation and monitoring measures as a precursor to scaling up commercial production to Project One;
- Demonstrate economic viability of commercial polymetallic nodule collection;
- Demonstrate the environmental performance of a continuously operating commercial nodule collector system at a small scale prior to advancing to full commercial production with Project One;
- Demonstrate the reliability of transshipment of nodules to an RKEF processing facility;
- Provide an extended period of continuous operation to further quantify and characterize the environmental impacts of a commercial operation prior to ramping up to a full capacity commercial collection system.
- Address any technical or environmental performance improvement opportunities with the prototype collector system not fully resolved during the short-duration prototype collector test;
- Test assumptions made by the EIS and predictive modeling prior to increasing the scale of commercial production by advancing to Project One;
- Allow for the testing and calibration of the Adaptive Management System developed for NORI-D prior to increasing the scale of commercial production by advancing to Project One;
- Demonstrate and refine the methods and measures described in the Environmental Monitoring and Management Plan developed for NORI-D prior to increasing the scale of commercial production by advancing to Project One.

While actual capital costs may differ from those currently anticipated, as of Q2 2022 the current estimates for costs to bring the Project Zero offshore system into production is $110 million. NORI and Allseas intend to equally finance all costs related to developing the first commercial system.

Project Zero entails:

- Refurbishment of a production vessel (the *Hidden Gem,* see Image 2)
- Nodule collection using one collector robot (1.3 million wet tonnes per year)
- Transshipment of the nodules to an existing or "brownfield" port facility (location yet to be finalized)
- Stockpiling and tolling the nodules through existing RKEF processing facilities

NORI has also engaged in several technical scoping studies to determine the potential for a first small-scale production plant location and outputs.

Image 2: The Hidden Gem, a converted 228-meter-long drillship

Source: Allseas (accessed 3/26/2022); prototype robotic collector highlighted in yellow circle

3. Project One

Subject to achieving the objectives for Project Zero, NORI will propose to ramp-up operations to Project One. Full implementation of Project One as currently planned would involve a three-step progression. As illustrated in Figures 4 and 5, these steps involve scaling up collection and processing from 1.3Mtpa to an approximate average of 12.5Mtpa of wet nodules at steady state production (expected 2030-2045).

As currently estimated, the steps to ramp-up entail: (1) the introduction of a second converted drillship (Drillship 2), with a capacity of up to 3.6 Mtpa (wet), (2) a further upgrade of the Hidden Gem to up to 3.6 Mtpa (wet), and (3) construction of a new purpose-built production support vessel (Collector Ship 1) with capacity of up to 8.2 Mtpa (wet), totaling a maximum annual capacity of 14.1 Mtpa (wet) and an annual average of 12.5 Mtpa (wet) over life of mine. Project One is expected to benefit from lessons

learned during the Collector Test and Project Zero. Prior to commencing Project One, NORI will provide the ISA with documentation detailing how the objectives for Project Zero have been achieved.

Processing Nodules

The processing of the nodules will also be ramped up in phases and NORI is considering several options.

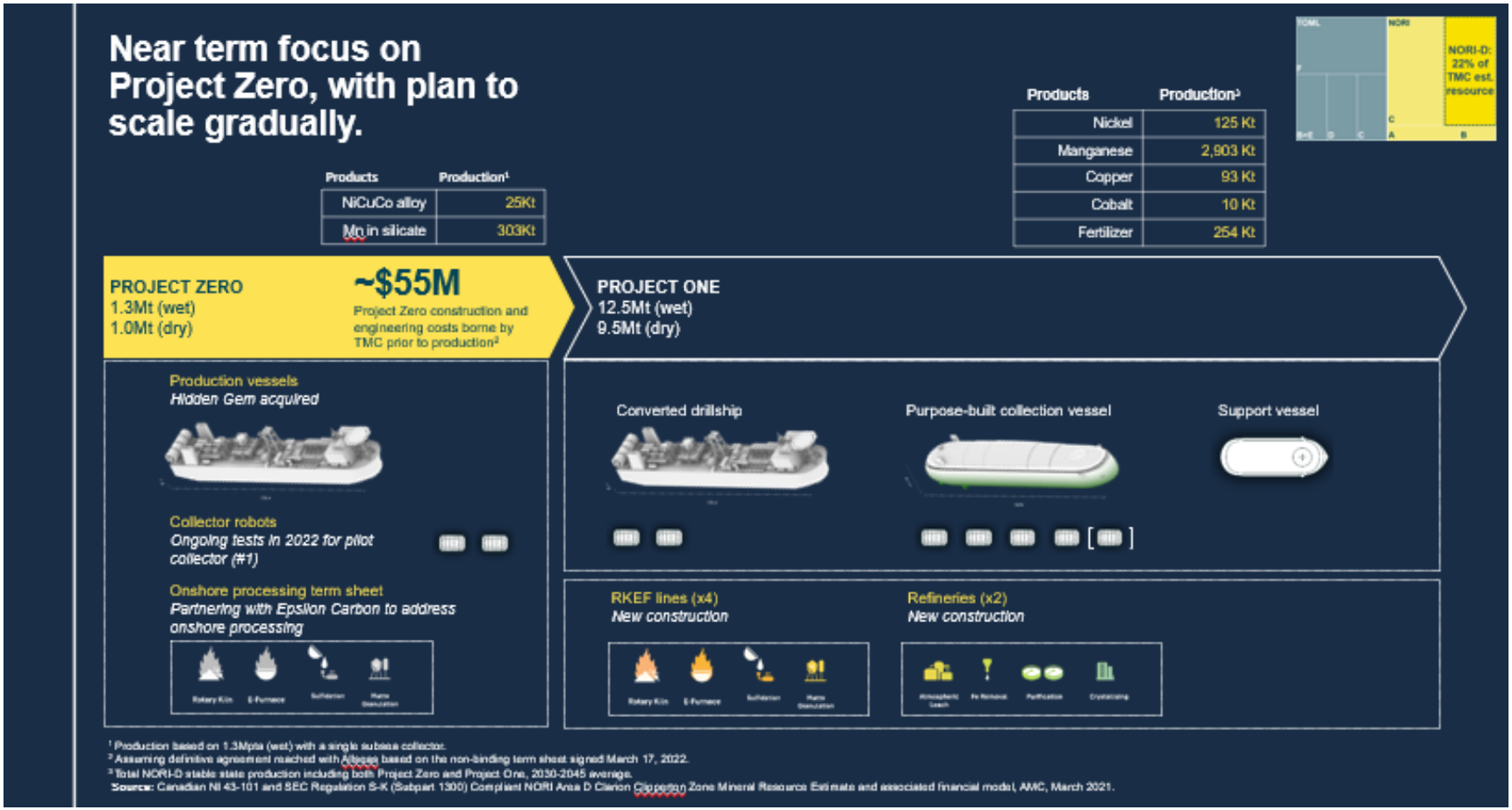
For Project Zero, NORI intends to toll-treat polymetallic nodules at existing Rotary Kiln-Electric Furnace (RKEF) facilities, utilizing excess industry capacity. NORI advises there is significant interest from several parties in Asia to utilize RKEF plants which have become stranded as a result of the Indonesian government nickel laterite ore export ban restricting supply of the nickel laterite feedstock that they currently utilize. These RKEF plants were originally built to convert nickel laterite to nickel pig iron and could be converted to toll-treat polymetallic nodules.

Simultaneously, NORI is examining a business collaboration with Epsilon Carbon Pvt[11]., LTD. to complete a pre-feasibility study for a commercial nodule processing plant powered by renewable energy to process 1.3 Mpta of wet nodules in India.

For Project One, the collected nodules are expected to be processed, either at a new facility to be constructed by TMC, or by potential processing partners, subject to available capital, and at third-party facilities pursuant to a toll-treatment model.

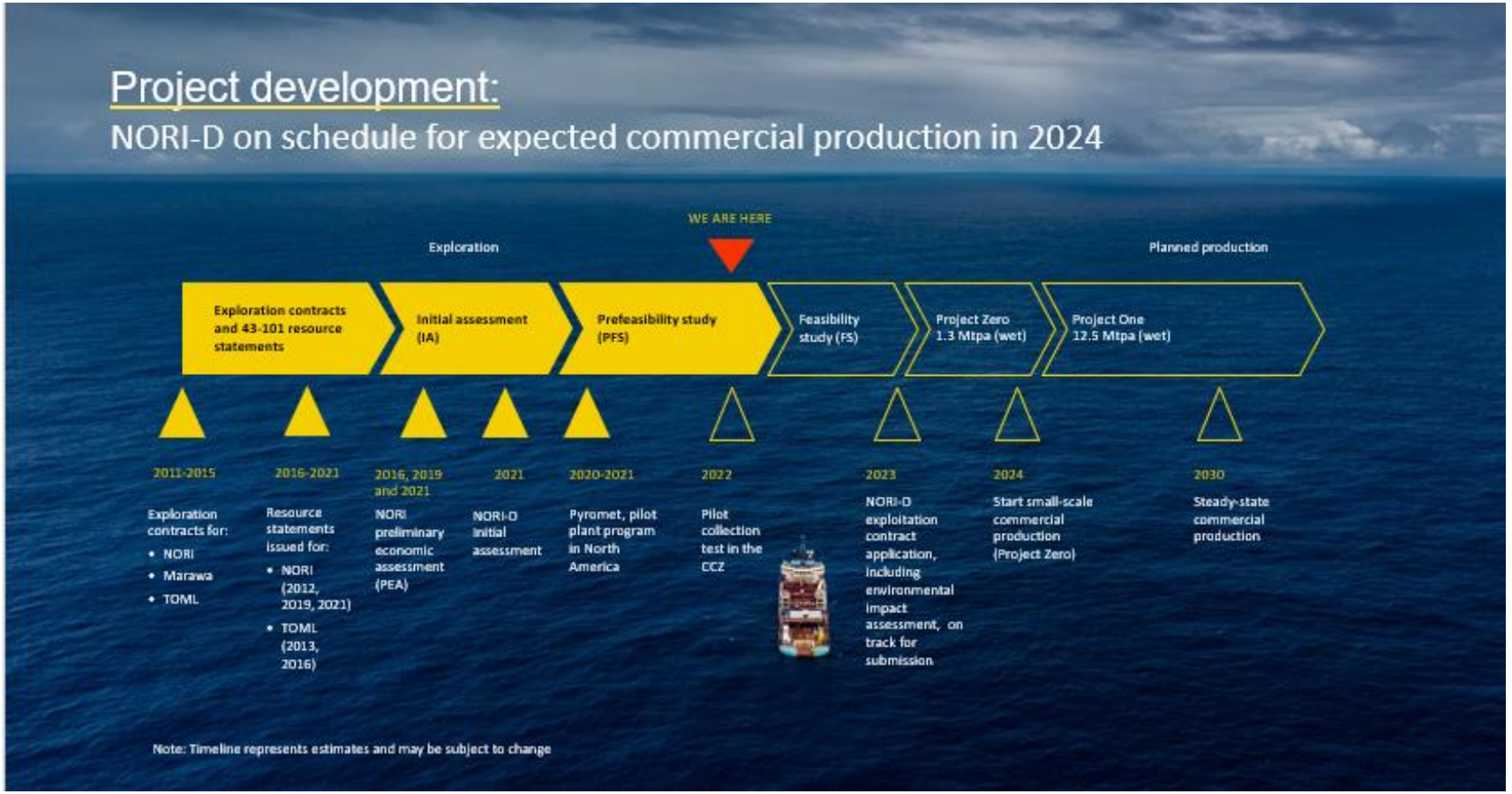
[11] The Metals Company Enters into Business Collaboration MoU with Epsilon Carbon to Complete A Pre-Feasibility Study For the World's First Commercial Polymetallic Nodule Processing Plant in India | The Metals Company

Figure 4: Illustration of NORI-D development plans



Source: Q1 2022 Update investor presentation. 1 Production based on 1.3 Mtpa (wet) with a single collector; 2. Assuming definitive agreement reached with Allseas based on the non-binding term sheet signed March 17, 2022; 3. Total NORI-D stable state production including both Project Zero and Project One, 2030-2045 Average Source: Canadian NI 43-101 and SEC Regulation S-K (Subpart 1300) Compliant NORI Area D Clarion Clipperton Zone Mineral Resource Estimate and associated financial model, AMC, March 2021

Figure 5: NORI-D project development schedule to achieve commercial production in 2024



Source: TMC. Note: Timelines represents estimates and may be subject to change and regulatory approval

D. Unique Attributes

As detailed further in this document, the Project's nodule collection has numerous unique attributes when compared to land-based mines. Typical attributes of a generic, large-scale mining operations are contrasted with the NORI-D Project's nodule collection. While this table shows that many typical concerns relating to construction and operation of a land-based mine are absent for NORI-D's Project, it is not implied that there may not be other types of impacts. These will be studied as part of the Project's environmental and social impact assessment.

Table 2: Comparing key aspects of generic land-based mines with NORI-D

Attributes	Mine	NORI-D
Multi-year construction of the mine and required infrastructure[12]	Yes	No
Co-location with local communities, and/or Indigenous People/Territories	Yes	No
Resettling of Affected Communities within mine footprint, required infrastructure, or buffer zones	Yes	No
Large-scale worker camps for construction and operation (hundreds to thousand of workers)	Yes	No
Arrival of up to thousands of workers from other regions or countries	Yes	No
Health, safety, and fatality risks at scales associated with mining projects[13,14]	Yes	No
Unplanned influx (in-migration) burdening local infrastructure	Yes	No
Potential for land conflicts, presence of child labour at/near mine sites and/or supply chains	Yes	No

[12] Construction of purpose-built vessels and other equipment may also take multiple years, but are expected to be completed within existing industrial zones, manufacturing facilities, and shipyards.
[13] See also selected country statistics in ICMM, 2019. Fatality Prevention, Eight Lessons Learned, at Table 1: Mining fatalities in selected countries 2008–2018, https://www.icmm.com/website/publications/pdfs/health-and-safety/2019/publication_fatality-prevention.pdf
[14] For a comparison of human fatalities associated with mining vs. offshore operations, see Paulikas, D. et. al., (2020). Where should Metals for the Green Transition Come From? https://metals.co/download/237815/?tmstv=1668033071, page 130-134.

Attributes	Mine	NORI-D
Construction of water collection, diversion, and supply systems, competing for water sources	Yes	No
Clearing (removing) flora and associated impacts on species with special conservation status	Yes	No[15]
Developing an open mine pit or underground mine	Yes	No
Building access roads	Yes	No
Erecting transmission lines, dedicated power plant	Yes	No
Drilling dewatering or water supply well fields	Yes	No
Tailings management facilities required for large volumes of tailings generated, waste rock dumps	Yes	No
Road, rail, or port linkages for export of concentrates/products	Yes	No
Large-scale entrenchment associated with mine closure	Yes	No

Source: Prizma

In contrast to land-based mining, the proposed nodule collection requires modification (refurbishment) of one or more drill ships and construction of purpose-built ships, development, and fabrication of remotely operated nodule collector vehicles, a riser system to lift nodules to the collection vessel, development and operations of adaptive management systems, and transshipment of nodules to shore-based processing sites.

The offshore nodule collection activities are expected to involve a relatively small peak operating workforce involving back-to-back shifts of a total of approximately 150 workers per vessel (one vessel during Project Zero, three vessels during Project One, total approximately 650 workers), and additional small crews (back-to-back shifts) for multiple nodule transport vessels totaling approximately 200 workers distributed over several vessels.

The Project's onshore processing facilities are expected to have certain attributes which may be comparable to conventional processing/smelting facilities. However, NORI is exploring with strategic partners construction and/or refurbishment of strategically located "brownfield" facilities, with access

[15] While there is no flora (plants) in the cold, dark and high-pressure conditions typical of abyssal plains, concerns have been raised about adverse impacts, including on biodiversity, and ecosystem services.

to renewable power, to further minimize the operation's greenhouse gas emission profile. The size of temporary (construction) and permanent (operations) workforce for these onshore facilities have not been fully defined at this stage and are expected to be approximately 1,650.

While Table 2, above, provides a more generic comparison, Table 3 compares selected attributes of the NORI-D Project with an operating mine and processing facility: the Ambatovy Nickel and Cobalt mine (Ambatovy) in Madagascar, as a comparative alternative source of target metals. Ambatovy was selected because it is a large-scale Nickel and Cobalt mining and processing operation, was financed by numerous development banks[16] which apply the IFC Performance Standards (or equivalent), and provides data visibility (not because Ambatovy is the "best" or "worst" operation).

As highlighted in Table 3, the unique attributes of the NORI-D Project include its unique regulatory context, the nature of resources which sit unattached on the seafloor and do not require most of the typical mining infrastructure, nor removal of overburden to access it, no presence of local affected communities at the nodule collection site (nearest island and populated landmass located at a distance of approximately 700 km and 1,700km, respectively), and substantially lower resource and GHG intensity.

Similar to extractive sector projects in frontier or offshore regions, biodiversity (and other) concerns have been raised by, for example, several non-governmental organizations (and others), including calling for a 10-year moratorium on deep-sea mining[17]. It is noted that no deep-sea mining has taken place in international waters to date, although it has been studied since the early 1970's.

[16] The Japan Bank for International Cooperation (JBIC), Export-Import Bank of Korea (KEXIM), the Export Development Canada (EDC), the European Investment Bank (EIB), and the African Development Bank.
[17] See, for example, WWF's Policy Position on Deep Sea Mining: https://wwfint.awsassets.panda.org/downloads/wwf_policy_position_deep_seabed_mining_2020_final.pdf, accessed 4/4/2022

Table 3: Comparison of Ambatovy and the NORI-D Project using selective criteria[18]

Attribute	Ambatovy	NORI-D
Location	• Ambohimanarivo, Madagascar	• Deep-sea PMN collection in CCZ, located in Areas Beyond National Jurisdiction (International Waters). • Onshore facilities: not fully defined at this stage
Applicable standards	• Madagascar's jurisdiction, applied also IFC Performance Standards, Equator Principles	• ISA regulatory regime applies to NORI-D's PMN collection and is expected to include the IFC Performance Standards and Equator Principles. • Due to location in the CCZ, the Project is subject to approval, monitoring and governance by the multilateral ISA, in addition to Nauru. ISA's voting members include 167 States, including Pacific Small Islands Developing States, and the European Union. • Unique context also includes Common Heritage of Humankind (see also Box 1) and distribution of economic benefits. • Onshore facilities will be subject to their host countries regulatory requirements (not the ISA). NORI plans to adopt GIIP.
Project cost	• US$9.0 billion[19]	• Estimated US$7.2 billion (NORI-D Project Zero and Project One, including offshore and onshore facilities)
Description	• Includes open-pit mining, slurry pipeline, leach process plant, tailings facilities, harbor expansion	• The phased NORI-D Project (comprising Project Zero and Project One) involves the deep-sea collection of PMN, transshipment to and through existing ports for toll-treatment at existing rotary kiln-electric furnace smelters, and/or future development of a new-built facilities and nodule processing plant.

Production	• 2021:
	  ○ Nickel: 29.3 kt
	  ○ Cobalt: 2.1 kt
	  ○ Ammonium sulfate: 93.4 kt
		Project Zero:
		• NiCuCo alloy: 25,000 tonnes/year; Manganese in silicate: 303,000 tonnes/year
		Project One (steady state, 2030-2046) annual production:
		• Nickel: 125 ktpa

[18] References: Dynatec Corp., 2006. Environmental Assessment Ambatovy Project Summary; Ambatovy Sustainability Reports 2010, 2017 - 2019; https://ambatovy.com/en/sustainability/environment/conserving-local-biodiversity/ accessed 4/15/2022; NORI (see also Figure 6 and footnotes); TMC draft 2021 Sustainability Report; health and safety statistics presented include TMC, NORI, GreenMetals and Contractors. LTIFR – time injury frequency rate. DSM – Deep-sea mining

[19] https://www.jwflegal.com/experience/mining/advice-on-us-8-5bn-ambatovy-project-financing-in-madagascar/, accessed 4/17/2022

Attribute	Ambatovy	NORI-D
		• Cobalt: 10 ktpa • Manganese: 2,903 ktpa • Copper: 93 ktpa • Ammonium sulfate: 254 ktpa
Tailings Management Facility	• Ambatovy's TMF and its consequence of failure classification not reported to/ available at the Church of England's Global Tailings Portal	• No tailings generated. NORI-D's collecting PMN from the deep-sea does not entail the construction of a TMF.
Other mining waste	• Industrial waste, including ash, Sulphur waste, and scrap metal	• It is expected that approximately 90 percent of the entrained sediments collected with the nodules will be separated and discharged at the seafloor level, with additional discharge of entrained sediment and nodule debris at a depth to be confirmed following the Collector Test and impact assessment studies (currently assumed 1,200 meters below surface).
Workers or Jobs created	• Construction: 18,000 • Operations: 3,500	**Project One** • Offshore construction (at existing fabrication and shipyards): assumed approx. 250 • Offshore operations: estimated 650 workers for collector vessels, 200 for transport vessels • Onshore operations: approximately 1,650 workers (strategic choices, locations under review)
Health, Safety & Security	• 2015 – 2019: • Fatalities: 3 in 2015, 1 in 2019 • LTIFR range: 0.02 to 1.31 • Significant security incidents reported annually	• TMC: 2018 – 2021 (incl. subcontractors, still exploration stage, focused on off-shore activities) • Fatalities: 0 • LTIFR: 0 • No significant security incidents. • NORI-D expects to adopt and apply GIIP for its future land-based operations and facilities.
Resettlement impacts	• 296 families	• None (0) expected for offshore component of Project Zero and One. None expected for undefined onshore facilities as expect to use of brownfield port facilities and RKEFs, at least initially (Project Zero), would suggest new resettlement impacts unlikely or very limited.

Attribute	Ambatovy	NORI-D
Biodiversity	• Madagascar is considered one of world's biodiversity hotspots[20]. Impacts forest/land 2,854 ha (28.54 km^2). Ambatovy reports presence of 109 flora species of concern, 118 species of birds, 92 species of amphibians, 69 species of reptiles. Over 50 endangered or critically endangered flora and fauna species. Developed an offset program and to achieve no net loss in biodiversity, preferably a net gain.	• NORI-D is located in generally common habitat (abyssal planes cover 70% of ocean floor[21]) –Total nodule collection/mine size area for NORI-D is approximately 25,000 km^2. • Within NORI-D, preservation reference zones (PRZ, approximately 10-14% of total NORI-D contract area) are designated "no mining" areas. NORI expects to identify and select these so that they represent key biotopes within NORI-D. NORI will also leave behind undisturbed nodules so that they can serve as "stepping stones" for connectivity across NORI-D. Currently, its is not definitively known how effectively the risk of biodiversity loss could be mitigated or reduced for deep nodule collection. • To safeguard seafloor biodiversity and ecosystem functions of the CCZ, the ISA designated "Representative Areas of Particular Environmental Interest" (which are effectively "no mining" areas) and cover about 43% of CCZ.
GHG Emissions	• 2021: approximately 1,621,000 tCO2 (includes operation's coal power plant contributing about 60%). • No project LCA-type GHG intensity data in public domain.	• An on-going life-cycle assessment (LCA) of the NORI-D's nickel indicates a Global Warming Potential (GWP) of approximately 0.51kg of CO_{2e} per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%, 78% and 68% lower GWP, respectively[22].

References: Dynatec Corp., 2006. Environmental Assessment Ambatovy Project Summary; Ambatovy Sustainability Reports 2010, 2017 - 2019; https://ambatovy.com/en/sustainability/environment/conserving-local-biodiversity/ accessed 4/15/2022; NORI (see also Figure 6 and footnotes); TMC draft 2021 Sustainability Report; health and safety statistics presented include TMC, NORI, GreenMetals and Contractors. LTIFR – time injury frequency rate. DSM – Deep-sea mining

[20] According to Conservation International, an NGO, around the world, 36 areas qualify as hotspots. Their intact habitats represent just 2.5% of Earth's land surface, but they support more than half of the world's plant species as endemics — i.e., species found no place else — and nearly 43% of bird, mammal, reptile, and amphibian species as endemics.
[21] https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-floor-features
[22] Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. At the time of drafting this document, BMI LCA Results are undergoing third party verification.

E. Project Justification

Economic Rationale

As detailed above (Project Description), NORI plans to collect PMN from the seafloor of the abyssal planes seafloor at over 4,000 meters depth, within the CCZ in the Pacific Ocean. These nodules contain metals commonly used for Li-ion battery cathodes as well as other uses, such as electric wiring and steel. The nodules contain nickel, cobalt, copper, and manganese—viewed as critical or strategic in many countries around the world given their role in enabling the clean energy transition.

According to TMC's October 2022 corporate presentation[23], the capital spent on the NORI property has been approximately $250 million since 2011, and the net present value (NPV_9) of the NORI-D Project is estimated at US$6.8 billion at CRU long-term metal prices (Feb 2021) and US$13 billion at more recent metal prices (October 12, 2022)[24].

Benefit Sharing

According to AMC's 2021 Initial Assessment[25], the Project will generate approximately US$7.2 billion in cumulative royalties, which is mostly payable to the ISA. The detailed modalities of such payments have yet to be finalized by the ISA. This compares to ISA's 2021-2022 budget of approximately $19.5 million[26].

The ISA is required to earmark revenues collected from the Area for the following three priority areas:

1. Provide for its administrative expenses (also replacing the contributions from ISA Member States),
2. Contribute to a fund to assist developing countries which may suffer adverse effects on their export earnings or economies due to deep-sea mining, and
3. Equitably distribute excess revenues for the benefit of humankind.

The ISA's largest and lowest five beneficiaries identified using models of equitable distribution of financial payouts from deep-sea mining royalty fund are tabulated below (see ISA's publications[27] for details of methodologies developed and applied).

[23] See "Latest Presentation" at https://investors.metals.co/, accessed October 14, 2022
[24] SEC Regulation S-K (Subpart 1300) Compliant NORI Area D Clarion Clipperton Zone Mineral Resource Estimate and associated financial model, 17 March 2021. NORI-D resource – 11 MT inferred @ 1.4% Ni, 1.1% Cu, 0.1% Co, and 31.0% MN and 15.6 kg/m2 abundance, 341 MT Indicated @ 1.4% Ni, 1.1 % Cu, 0.1% Co and 31.2% Mn and abundance 17.1 Kg/m2, 4 MT Measured @ 1.4% Ni, 1.1% Cu, 0.1% Co, and 32.2% MN and 18.6 Kg/m2.
[25] AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clippperton Zone, in accordance with the requirements of SEC Regulation S-K (subpart 1300), dated March 17, 2021
[26] ISA, 2022. Secretary General Annual Report 2022, Ensuring the Sustainable Management and Stewardship of the Deep Seabed and its Resources for the Benefit of Humankind, see https://isa.org.jm/files/files/documents/ISA_Annual_Report_2020_ENG_1.pdf.
[27] ISA, 2022. Equitable Sharing of Financial and Other Economic Benefits from Deep-Sea Mining, ISA Policy Brief 01/2022

Table 4: Largest and lowest five beneficiaries of deep-sea mining royalty funds

Country	Population (% of total)	Average GNI per Capita (US$)	Geometric Mean Formula (%)	Original Formula (%)
Indicative shares of the largest five beneficiaries (top 5 ranking varies by approach, so 6 listed)				
India	20.51	1,916	7.23	27.72
DR Congo	1.25	500	3.50	0.10
China	21.23	9,320	3.34	5.90
Somalia	0.22	107	3.19	5.41
Pakistan	3.19	1,535	3.18	5.38
Bangladesh	2.45	1,613	2.72	3.93
Indicative shares of the lowest five beneficiaries				
Tuvalu	<0.01	5,475	0.0125	<0.001
Palau	<0.01	17,418	0.0088	<0.001
Cook Islands	<0.01	19,983	0.0085	<0.001
Nauru	<0.001	12,026	0.0042	<0.001
Monaco	<0.001	180,859	0.0001	<0.001

Source: ISA Policy Brief 01/20022, Equitable Sharing of Financial and Other Economic Benefits from the Deep-Sea Mining, see Table 1, GNI – Gross National Income.

The ISA is also considering establishing a global fund, modeled after the Global Environmental Facility[28], to invest in knowledge and competence related to the Area[29]. This would include basic and applied research, capacity-building, and fostering other public goods related to the deep-sea.

In addition, over its lifetime, the integrated NORI-D project is estimated to pay a total of US$9.1 billion in onshore corporate tax, expected to be payable to the host nation of the processing plant[30]. Third-party service providers to the Project would also be paying additional taxes in their own jurisdictions.

Pursuant to its sponsorship agreement with NORI, which is subject to review from time to time, Nauru would receive a payment linked to quantity of nodules recovered from the exploitation contract area.

[28] https://www.thegef.org/
[29] ISA, 2022. Equitable Sharing of Financial and Other Economic Benefits from Deep-Sea Mining, ISA Policy Brief 01/2022
[30] AMC, 2021. Technical Report Summary, Initial Assessment of the NORI Property, Clarion-Clippperton Zone, in accordance with the requirements of SEC Regulation S-K (subpart 1300), dated March 17, 2021

NORI-D integrated project is estimated to be USD 9.2 billion in taxes over lifetime of the project. A share is attributable to offshore nodule collection and transport. Currently, NORI is not subject to CIT in Nauru because as a small island developing state, Nauru does not have in place reciprocal tax agreements. This could subject NORI to double taxation and disadvantage NORI when compared to land-based producers and ISA Contractors sponsored by larger more developed States. NORI and Nauru are working to resolve this issue.This could generate a significant additional financial benefit to Nauru. While both parties are committed to this outcome, it still requires finalization.

Averting Climate Crisis requires More Metals

A 2021 study by the International Energy Agency (IEA) notes that reaching the goals of the Paris Agreement would require a quadrupling of mineral requirements for clean energy technologies by 2040. A goal of reaching net-zero globally by 2050, would require six times more mineral inputs in 2040 than today[31]. This means that, at current scale and speed of metals production, it will not be possible to avoid catastrophic consequences of global warming and reach the Paris Agreement targets of keeping temperatures below or well below 2°C by the end of the century.

The above refenced study also highlights that increasing recycling would not eliminate the need for new supplies, as not enough stocks of these metals have been accumulated to date. The IEA estimates that by 2040, recycled quantities of copper, lithium, nickel, and cobalt from spent batteries could reduce combined primary supply requirements for these minerals by around 10 percent[32]. This means that around 90 precent of a continuously growing demand will require other sources for the foreseeable future.

According to a 2022 IEA study focused on the global supply chains for EV batteries[33], its supply chains will have to expand ten-fold to meet government EV ambitions. For nickel, IEA estimates that 41 to 60 additional mines (with average 38 kt of nickel production per year) will be required by 2030 to meet projected demand from the 2021 demand level.

Several challenges exist in obtaining the necessary metals on a timeline meaningful to mitigate climate change. As land-based ore grades continue to decline, extracting these metals requires more energy, exerts upward pressure on production costs, increases water stress, generates more greenhouse gas emissions[34], and impacts more areas with high biodiversity value, such as those located in Indonesia, New Caledonia, and the Philippines[35].

Reducing Dependency

The expected supply deficit is being exasperated by geopolitical, security, and other supply chain risks linked to dependencies on a few countries which dominate the mining and processing of battery metals today. For example, the world's three largest Nickel operations, ranked by resource size, comprise Nornickel (based in Russia), FeNi Halmahera (based in Indonesia, with offtake agreements with

[31] IEA, 2021. The Role of Critical Minerals in Clean Energy Transition.
[32] IEA, 2021. The Role of Critical Minerals in Clean Energy Transition.
[33] IEA, 2022. Global Supply Chains of EV Batteries
[34] Kregoir, Liesbet, 2022. Metals for Clean Energy: Pathways to solving Europe's raw materials challenge
[35] https://www.maplecroft.com/insights/analysis/mining-operations-face-growing-biodiversity-risks

Chinese companies[36]), and Jinchuan (China)[37]. Australia and Indonesia have the largest reserves of nickel globally with over one-fifth of all nickel deposits each. Nickel production from Indonesia has grown almost three times since 2017, and the country is now the largest producer with over 30% of the global production[38].

In 2021, the United States (US) government announced[39] a target of 50 percent electrical vehicle sales by 2030. At the same time, the Biden administration's 100-Day Review[40] of Critical Minerals Supply Chains estimated that fully electrifying US car sales would require 1,273 kilotons per annum (ktpa) of Class 1 nickel and 160 ktpa of cobalt. This compares with existing US-based primary production of 14 ktpa of Class 1 nickel and 0.5 ktpa of cobalt.

Low-carbon Metal Production

An on-going life-cycle assessment (LCA) of the NORI-D's project indicates a Global Warming Potential (GWP) of approximately[41] 0.51kg of CO2e per 1 kg of wet nodules collected, processed and refined into end-products (nickel sulfate, cobalt sulfate, copper cathode and manganese silicate). When compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the Nickel produced from NORI-D results in 94%,

[36] https://www.woodmac.com/reports/metals-pt-halmahera-persada-lygend-nickel-operation-517159/

[37] Global Nickel Industry Cost Summary, Wood Mackenzie, August 2020; inclusive of reserves; Asset Reports for Dumont, Wingellina, Araguaia, NiWest Laterite, Norilsk, FeNi Halmahera, Jinchuan and Koniambo, Wood Mackenzie

[38] Nickel Investing News, Top 9 Nickel-producing Countries (Updated 2022), Accessed on October 3, 2022

[39] https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/#:~:text=August%2005%2C%202021%20%E2%80%A2%20Statements%20and%20Releases%20President,and%20Advance%20Smart%20Fuel%20Efficiency%20and%20Emission%20Standards accessed 4/14/2022

[40] https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/08/fact-sheet-biden-harris-administration-announces-supply-chain-disruptions-task-force-to-address-short-term-supply-chain-discontinuities/ accessed 4/14/2022

[41] Source: NORI and Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. BMI LCA results are undergoing third party verification (November 2022)

78% and 68% lower GWP, respectively. The result of the LCA for NORI-D Project's emissions are depicted below and are still subject to third-party verification.

Figure 6: NORI-D Project CO2e emissions

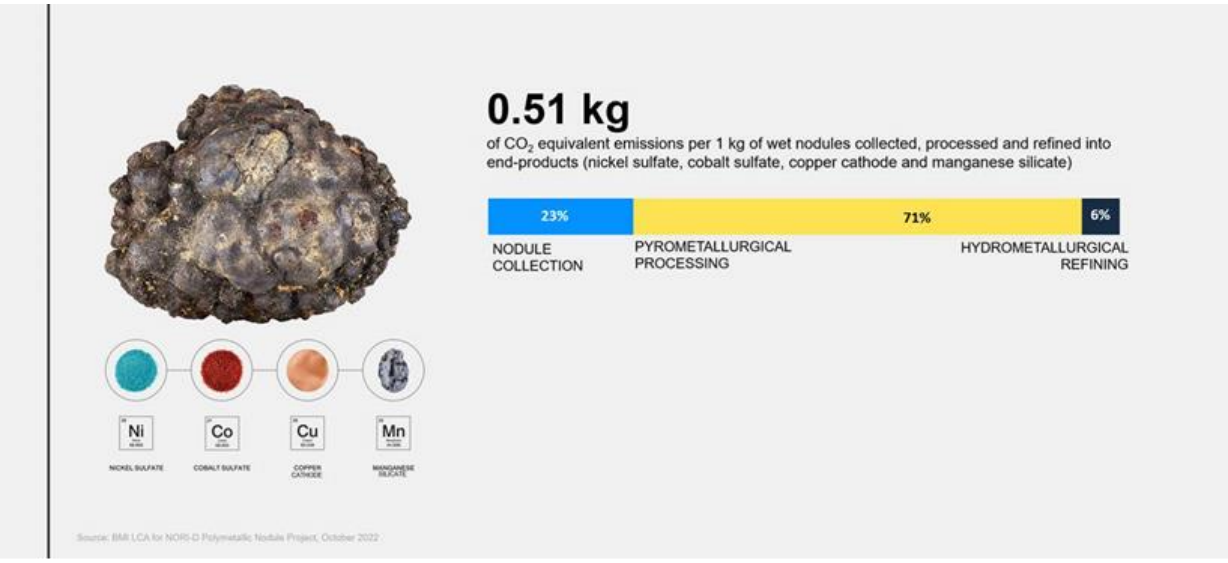
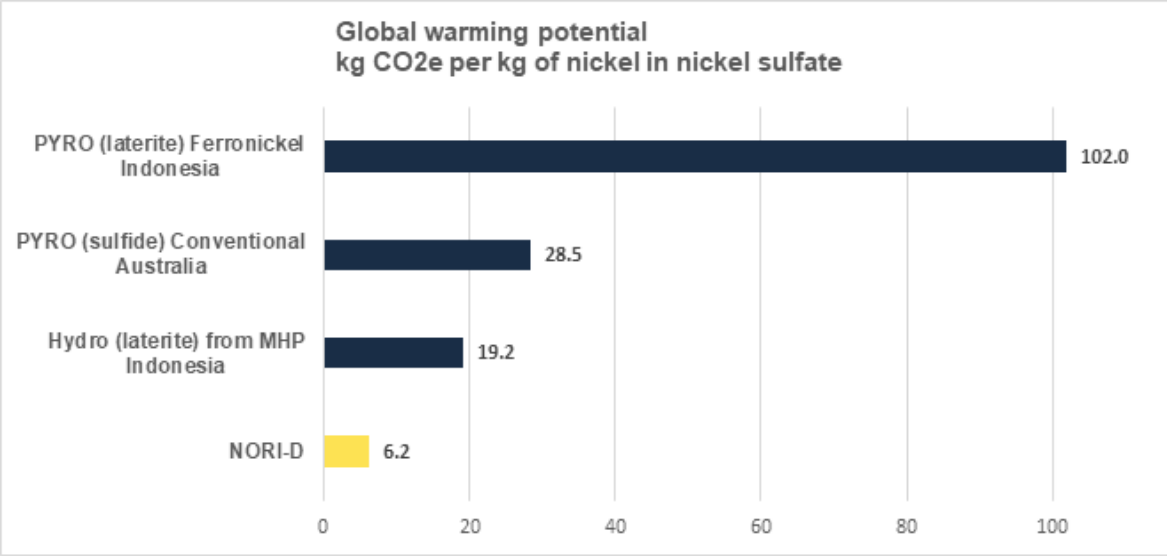


Figure 7: Global warming potential (kg CO2e per kg of nickel in nickel sulfate)



Source : NORI and Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022. BMI LCA. Results are undergoing third party verification (November 2022).

No Tailings Dams

The combination of higher grades found in nodules, no overburden[42] to be removed as the nodules sit unattached on the seafloor and developing a nodule processing flowsheet which features near-zero solid processing waste generation, means that NORI-D Project is expected to have a substantially lower resource intensity and does not require tailings dams typically used for land-based mining operations.

Social Impacts of Alternatives

Without contributions from deep-sea PMN nodule collection in the CCZ, the demand for energy transition metals will result in ongoing and/or additional expansion of existing and/or start-up of new land-based operations. According to a 2022 IEA study focused on the global supply chains for EV batteries[43], IEA estimates that 41 to 60 additional nickel mines (with average 38 kt of nickel production per year) will be required by 2030 to meet projected demand from the 2021 demand level.

Recent scientific and financial research publications outlined further below highlight the social challenges - especially in terms of Indigenous Peoples - associated with the development of energy transition minerals in both developing and developed countries.

At a global level, a 2022 article by Owen *et al.*[44] notes that energy transition minerals and metals mining (ETM) projects routinely require land that is already occupied or used for other purposes. The authors conclude that in the sample studied (n= 5,097), 69 percent of ETM projects are situated in areas with Indigenous Peoples' and peasant land.

For the USA, a 2022 MSCI Inc. article[45] highlights that 97 percent of Nickel, 89 percent of copper, 79 percent of lithium, and 68 percent of cobalt reserves and resources are located within 35 miles (56 km) of Native American reservations (Figure 8), and many such operations have been facing opposition.

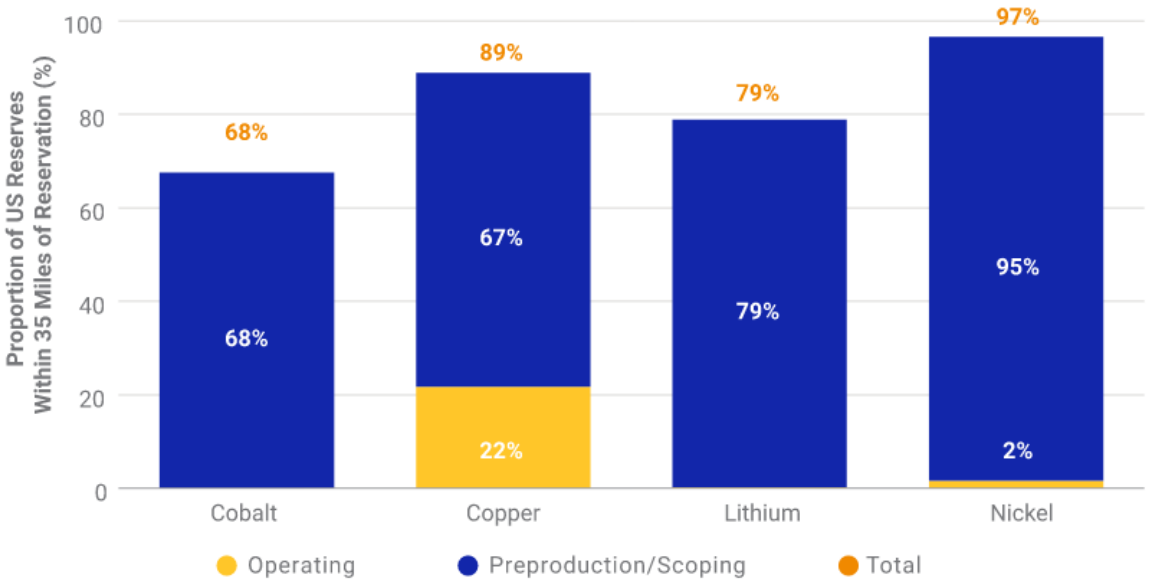
[42] Approximately 5cm of seabed sediments are expected to be entrained and collected during the nodule collection process. It is expected that approximately 90 percent of the entrained sediment collected will be separated and discharged at the seafloor level. The balance will be transported to the surface vessel to be separated and discharged back to the ocean at a depth to be determined. The scale and effect of the sediment plume generated by the collector vehicles will be tested, monitored, and analyzed during the Collector Test phase in Q3/2022.

[43] IEA, 2022. Global Supply Chains of EV Batteries

[44] Owen, J.R., Kemp, D., Lechner, A.M. *et al.* Energy transition minerals and their intersection with land-connected peoples. *Nat Sustain* (2022). https://doi.org/10.1038/s41893-022-00994-6

[45] https://www.msci.com/www/blog-posts/mining-energy-transition-metals/02531033947

Figure 8: US Transition-metal reserves within 35 miles of Native American Reservations



Source: Block, S., Mining Energy-Transition Metals: National Aims, Local Conflicts, Jun 3, 2021, ESG Research 4/14/2022

Biodiversity Opportunity Costs

Continued and sole reliance on land-based nickel and other battery metals mining operations will further increase well-known biodiversity risks (and on-going biodiversity decline[46]) without delivering the rapid battery metals supply required to enable transition towards a low carbon economy and halt global warming.

When considering the sustainability assessment of nickel mining, the 2022 KU Leuven study[47] highlights that 54 percent of global nickel production happens in areas with a high biodiversity risk, notably Indonesia, Philippines, and New Caledonia.

According to a recent article in Science[48], under business-as-usual global temperature increases, the marine systems are likely to experience mass extinctions on par with past great extinctions. However, reversing GHG trends would diminish extinction risks by more than 70 percent, preserving marine biodiversity accumulated over the past ~50 million years of evolutionary history.

The development of mitigation and monitoring strategies to avoid or reduce the risk to biodiversity loss in the CCZ and determine how long it will take for disturbed seafloor areas to recover naturally will form an important part of the operational EIS. It is noted that the total NORI-D's contract area of approximately 25,160 square kilometers (or 0.56 percent of the CCZ), will not be completely exploited. Approximately 10-14 percent of the contract areas will be set aside for preservation, and other areas are only partially exploitable for a variety of reasons, such as topographical constraints. This compares

[46] WWF Living Plant Report 2020
[47] Kregoir, Liesbet, 2022. Metals for Clean Energy: Pathways to solving Europe's raw materials challenge
[48] Penn, J., and C. Deutsch, 2022. Avoiding ocean mass extinction from climate warming, Science, 28 Apr 2022, Vol 376, Issue 6592, pp. 524-526, DOI: 10.1126/science.abe9039

to approximately 4,500,000 square kilometers comprising the CCZ. The ISA has already designated approximately 1,900,000 square kilometers or over 43 percent of the CCZ as “no mining” areas. The size of the protected “no mining” area within the CCZ is over 75 times the size of the NORI-D contract area.

The extent to which planned measures, such as leaving behind partial nodule cover and setting aside no-take zones inside contract areas would aid recruitment and recovery of nodule-dependent species in impacted areas and/or the CCZ more broadly are being studied. Such aspects have also been considered when ISA designated four additional Areas of Particular Environmental Interest (APEIs 10 - 13) in 2021[49].

Marine Scientific Knowledge and Capacity Building

The Project would also continue to contribute to the growing understanding of the deep-sea and its ecology. The datasets from scientific and other investigations by NORI are believed to be the largest by any contractor in the CCZ to date and have been collected at a cumulative expense of approximately $100 million[50]. Results of these scientific studies are provided to the ISA. Scientists deriving work from these samples are free to publish their findings.

Also, the ISA has developed DeepData, an open-source database to house all the scientific and environmental data collected by companies for the benefit of the scientific community. Data compiled as part of NORI’s EIS will be submitted to DeepData. To date, NORI has undertaken 18 offshore campaigns and over 100 studies to establish the baseline of the NORI-D license area. Data has been collected about the chemical, physical and biological characteristics of the water column and seabed in the NORI exploration area, down to 4.5 kilometers deep.

Pursuing a shared value approach and in line with ISA’s requirements, NORI also contributes to capacity building and training initiatives. In 2020 and 2021, such contributions included a scholarship for post-graduate work at University of the South Pacific, training and internship opportunities for two engineers, and 11 young scientists (of which 10 women) participating in offshore campaigns, one scholarship to Nauruan national to pursue undergraduate degree in marine sciences, and other school and literacy programs. NORI is also a co-sponsor of the ISA’s Secretary General’s Award for Excellence in Deep-Sea Research. NORI has also committed to increasing its initiatives in the coming years and once it moves into operation. Additional details about training and community development activities of NORI are provided in TMC’s 2021 Impact Report[51].

In 2022, an additional 7 students will be awarded undergraduate scholarships to study at the University of the South Pacific starting in 2023. Three have been selected through the ISA’s contractor training program[52] and another three scholarships have been advertised to be awarded by end of Q4 2022 via NORI’s in country scholarship program.

[49] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf
[50] https://investors.metals.co/news-releases/news-release-details/metals-company-completes-latest-deep-sea-research-campaign-path accessed 4/7/2022
[51] https://metals.co/wp-content/uploads/2022/05/Final_MetalsCo_ImpactReport_052522.pdf#page=55&zoom=100,131,188
[52] Nauru Ocean Resources Inc. | International Seabed Authority (isa.org.jm)

IV. Mining Process

A. Conventional Mining

Before considering the mining and processing envisioned for NORI-D, it is useful to consider what processes are commonly used to develop mining operations on land. Conventional mining typically involves open cast or underground mining methods involving the following key activities:

- building mine camps to accommodate a workforce often measured in thousands,
- removal of forests and topsoil,
- diverting water streams,
- relocation of overburden and waste rock to waste rock dumps to access the ore body,
- mining the ore body using a mobile mining fleet, sometimes with the aid of explosives,
- processing and beneficiation the recovered ore (often using chemical additives) to generate a marketable intermediate product and by-products,
- disposing large quantities of waste materials behind tailings dams,
- transshipment of concentrates and/or intermediate products, and
- further hydro- or pyro-metallurgical processing to arrive at intermediate or end-products used in production of, for example, batteries or steel.

At the closure stage, open-pit mine sites and related facilities have typically already permanently changed (converted) land use to one or more pit lakes with variable water quality, tailings storage facilities, some with associated long-term risks, and waste rock dumps, sometimes the source of effluents with poor water quality, which may require long-term monitoring and treatment.

B. Deep-Sea Collection of PMN

The relative high-grade nodules within the NORI-D Project area are distributed unattached on the generally muddy seafloor surface of the abyssal planes at over 4,000 meters below surface, approximately 700 kilometers from the nearest island (Clarion Island, part of a designated UNESCO World Heritage site[53], which features a naval base), and 1,700 km to the nearest mainland of Mexico.

The offshore collection system consists of collector robots on the seafloor, a riser and lift system, and a surface production support vessel. The nodules would be expected to be collected from the seafloor by self-propelled, tracked collector robots using seawater jets aimed at nodules in parallel with the seafloor. No rock cutting, digging, drill-and-blast or other breakage are expected to be required at the point of collection. The collectors would be remotely controlled and supplied with electric power via umbilical cables from the production support vessel. To test the system and assess its environmental impacts, a pilot trial of the collection system is being conducted during Q4/2022.

[53] https://whc.unesco.org/en/list/1510/

The scale and effect of the sediment plume generated by the collector vehicles, as well as numerous other parameters, is being tested, monitored, and analyzed during the Collector Test. It is expected that approximately 90 percent of the entrained sediments collected with the nodules will be separated and discharged at the seafloor level. See also section on Biodiversity Aspect further below.

At the surface production support vessel, the collected nodules will be separated from the sea water – containing any residual sediments, nodule debris, and exhibiting elevated oxygen and temperature – is discharged at a depth of approximately 1,200 meters below sea level during the collector test. Models show that this discharge is expected to mix with 500 – 1,000 times the volume of surrounding seawater within 500 m of the discharge pipe, returning the water characteristics close to background levels. The exact depth and other parameters are still subject to the outcome of the Collector Test phase (expected completion end of Q4/2022).

The location of NORI's PMN deposit means that it does not compete with alternative anthropogenic land use. There is no need for drilling, removal of plants, or overburden, use of explosives, recovering of ore from open pits or underground mining, or mine-site based beneficiation/processing, to generate higher-grade intermediate products.

Unlike conventional mines, the development of NORI-D's PMN collection process also does not require certain new infrastructure, such as tailings dams, access roads, rail lines, transmission lines, or ports, largely avoiding related impacts. Also, there will be no need for an extensive fleet of mobile mining vehicles which are displaced with sub-marine robotic collectors.

Some new facilities may be required for onshore facilities, such as Rotary Kiln-Electric Furnaces (RKEF), which may have impacts generally similar to other modern RKEFs.

C. Onshore Facilities

The collected nodules would be transported by transport vessels to onshore processing facilities. Initially, in Project Zero, this is expected to comprise existing deep-sea port and processing facilities, although final analysis, decisions, and site selections have yet to be made. NORI is also exploring the building of a commercial small-scale Project Zero processing plant and using existing RKEF facilities.

In March 2022, TMC announced[54] that it entered into Business Collaboration Memorandum of Understanding with Epsilon Carbon, India's leading producer of graphite materials for lithium-ion battery anodes with ambitions to enter cathode material production, to complete a pre-feasibility study for the world's first PMN processing plant in India. Epsilon Carbon intends to deliver a pre-feasibility report for a plant in India powered by renewable power and with the targeted processing capacity of 1.3 million tonnes per annum of wet nodules. In parallel, TMC is exploring potential toll-treatment options through existing RKEF facilities.

For Project One, the options being considered include the construction of a purpose-built processing plant, including pyrometallurgical and hydrometallurgical circuits.

[54] https://investors.metals.co/news-releases/news-release-details/metals-company-enters-business-collaboration-mou-epsilon-carbon

From a social risk and impact perspective, facilities that will process nodules collected from the NORI-D area can be expected to be generally similar to those generated by other Rotary Kiln-Electric Furnace (RKEF) or "heavy industry" facilities. TMC selection criteria bias includes existing industrial sites with established ports, available renewable power, available gas, and proximity to trained workforce and existing infrastructure.

As will be detailed in TMC and/or NORI's policies and commitments, the NORI-D Project is expected to meet or exceed host country regulatory requirements, as well as integrate ESG principles and guidelines, such as those set forward by the IFC Performance Standards and Equator Principles, the UN Sustainable Development Goals (SDGs), and the Task Force for Climate-related Financial Disclosure (TCFD).

D. Biodiversity Aspects

To better understand the CCZ ecosystem and establish a baseline, NORI has been working with numerous world-leading deep-sea research institutions. These organizations are independent of NORI (and TMC), and researchers contractually retain their academic freedom to publish results. Institutions include Sweden's University of Gothenburg; the UK's Natural History Museum, National Oceanography Centre, University of Leeds, and Heriot Watt University; USA's University of Hawaii – Manoa, Texas A&M University, Florida State University; and the Japan Agency for Marine-Earth Science & Technology. This work is part of NORI's ESIA program, consisting of more than 100 discrete studies throughout the water column, from seafloor to surface.

TMC has also entered into a research funding agreement with a consortium of institutions led by Australia's Commonwealth Scientific Industrial Research Organisation (CSIRO). These institutions are tasked to create a framework for the development of an ecosystem-based management and monitoring plan (EMMP) for NORI-D. CSIRO will collaborate with researchers from Museums Victoria, Griffith University, and the University of the Sunshine Coast in Australia, as well as the National Institute of Water and Atmospheric Research (NIWA) in New Zealand.

TMC is also working with Kongsberg Digital to develop a "digital twin" for subsea nodule collection, which is a core component of a broader Adaptive Management System designed to enable sub-sea operations within targeted environmental impact thresholds. This planned Adaptive Management System will generate data feeds from environmental and operating sensors, use machine learning to make environmental impact predictions and include an environmental dashboard for monitoring and reporting impacts.

NORI-D's contract area is approximately 25,160 square kilometers. The monitoring outcome of the integrated Collector Test will help determine what percentage of this area may need to be designated as Preservation Reference Zones (PRZ). It is currently assumed that this may range from approximately 10 – 14 percent of the contract areas, representing all biotopes within the NORI-D area. It is also anticipated that up to a percentage of nodules would be left behind in the NORI-D operational area to act as "stepping stones" (providing connectivity) across the NORI-D area.

NORI's contracting area compares to approximately 4,500,000 million square kilometers comprising the CCZ. The ISA has already designated approximately 43 percent (about 1,900,000 million square kilometers) of the CCZ as APEI. This will allow these areas to function as *refugia* and provide repositories of genetic diversity representative of the CCZ and areas affected by deep-sea mining. In

the ecological literature[55], *refugia* have been defined as habitats that convey spatial and temporal resistance and/or resilience to biotic communities affected by disturbances, or as places or times where the negative effects of disturbance are lower than those in the surrounding area.

Biodiversity issues – as well as other environmental topics – will be included in the environmental impact assessments process. Linkages which may lead to significant social impacts will also be assessed.

E. Closure

Prior research indicates that the density, diversity, and function of fauna representing most of the resident biomass (including mobile, pelagic, and microbial life) are expected to recover naturally over years to decades. However, a high level of uncertainty exists around recovery of fauna that requires the hard substrate of nodules for critical life function. The extent to which planned measures such as leaving behind partial nodule cover and setting aside no-take zones would aid recruitment and recovery of nodule-dependent species in impacted areas will depend on factors like habitat connectivity, which is an area that is still under study. The Collector Test (expected completion Q4/2022) will represent the first temporal data point in the long-term monitoring program for the Impact Reference Zone (IRZ) and Preservation Reference Zone (PRZ). IRZs and PRZs are important in identifying natural variations in environmental conditions against which the impacts of mining can be assessed. A post-test long term monitoring program for the IRZ will be included in the Environmental Management and Monitoring Plan (EMMP) to be developed for submission with the application for the exploitation contract.

[55] https://www.iucn.org/resources/issues-briefs/biodiversity-offsets

V. Feasible Alternatives

A. Introduction

According to the International Association for Impact Assessment[56], a review of alternatives requires consideration of projects of a similar technical character or functionality that will meet the specified objective. Alternatives could be different locations, sizes, technologies, design, time frames, or operational procedures. The alternatives process should consider different ways of achieving the same objective. The "no action" (also known as the "zero alternative") should also be part of the analysis.

Given the focus of this SIA Scoping Document on social and livelihood aspects (including related ecosystem services) of the Project, the key alternatives considered are those linked to social issues. The operational EIA – and additional future ESIA-type studies which may be required for onshore processing facilities - will also consider other types of alternatives and their impacts, which are not discussed in this document.

Examples of such significant alternatives which are not discussed in this Scoping Document include, for example, siting of onshore facilities to ensure access to renewable power to minimize the operational carbon footprint of the processing facilities. Onshore facilities will be subject to their host countries' regulatory requirements. They do not fall within the regulatory regime of the ISA, which is focused on the ABNJ.

B. Alternatives in Conventional Mining

Alternatives in ESIA processes for a new mining project typically include mining methods (such as open pit or underground), and ore processing. Such alternatives are often influenced or limited by ore types and their metallurgical characteristics, and ore-body characteristics, such as homogeneity and depths, prevailing technologies, and cost, among other factors.

Many other alternatives involving social consideration which can be influenced by area footprint, environmental and social constraints, or contextual issues (such as availability of grid power or workforce, or legacy issues, such unresolved Indigenous claims, or past conflicts), and site-selection decisions for numerous infrastructures typically required. These can range from (participatory) selection of suitable sites for relocation of resettlement communities to identifying suitable sites for placement of waste rock dumps and tailings storage facilities.

Tailings storage or management facilities have emerged as a major concern of land-based mining projects. For example, since Vale SA's Brumadinho tailings dam disaster in Brazil, which released nearly 12 million cubic tons of mining waste (tailings) and killed 270 people[57], the Church of England has led a campaign by institutional investors to disclose the scale of risk and improve its management related to approximately 3,500 active tailings storage facilities worldwide[58]. The NORI-D Project does

[56] https://iaia.org/uploads/pdf/FasTips_11_AlternativesinProjectEIA.pdf
[57] https://www.mining.com/web/sec-sues-vale-for-false-claims-tied-to-brumadinho-dam-collapse/
[58] https://www.churchofengland.org/about/leadership-and-governance/church-england-pensions-board/pensions-board-investments/investor

not require tailings storage facilities (and is not subject to related risks), nor many other typical infrastructures required for conventional mining projects.

For NORI-D's significant onshore installations, such as those related to the construction of bespoke hydro- and pyrometallurgical processing facilities, there is currently insufficient information available to conduct any meaningful analysis of alternatives. However, given that the resource is collected and transported on a ship, existing industrial complexes accessible by deep-water ports are expected to offer the most energy and cost-efficient option.

While onshore facilities fall outside the jurisdiction of the ISA, its guidelines indicate the need to include consideration of Product Stewardship. It is expected that TMC and NORI will commit to meeting applicable host country regulatory requirements, as well as the IFC Performance Standards and Equator Principles.

More recently, new mining projects have also started to review feasible alternatives of other fuel and power needs in an effort to materially reduce their carbon footprint and align with the Paris Climate Accord. Examples of alternatives range from switching from fossil fuel to low-carbon mobile equipment, to considering integrating renewable power and battery storage options.

Without any further action, the NORI-D Project would generally be expected to be among the lowest carbon intensive battery metals producing operations. The company's on-going or planned studies already include access to renewable energy sources as a search criterion and will be discussed in the ESIA or other studies related to those facilities. As detailed further in its 2021 Impact Report, TMC has completed an assessment of its historic CO_2 emissions from 2012-2021, which total approximately 38.5kt CO_{2e}. TMC plans to offset these in the future using standard and blue carbon credits, which would also support related projects in Pacific Island nations.

C. No Action and Counterfactual

A preliminary comparison of "positive" and "negative" social effects considering the "No Project" versus "With Project" alternative is provided further below. Table 5 also includes a "Counterfactual" scenario, as the "No Project" option scenario will likely trigger other actions with their own risks/effects to satisfy the growing battery metals shortage. In other words, "No Project" does not equal elimination of social (and other types of) risks. Instead, such risks can be expected to be shifted to other projects/operations elsewhere.

Table 5: Preliminary comparison of "With Project," "No Project" and "Counterfactual" scenarios

Category	With Project	No Project	Counterfactual
Socio-Economic impacts	CAPEX of US$7.2 billion combined for Project Zero and Project One. Total ISA and Nauru royalties over project life: US$7.2 billion (excess revenues and other economic benefits to be distrusted equitably for the benefit of humankind. Total onshore payments and taxes paid over project life (partly paid in Nauru): $9.1 billion. Third-party service providers to the Project would also be paying additional taxes in their own jurisdictions. Proof of concept of deepsea mining. New source of key battery metals that can help meet growing demand, limit escalation of cost for selected EV batteries. Development and expansion of ISA to reflect increasing responsibilities.	No positive economic ripple effects from major investments including employment, capacity building and training and social investments. No Project revenues for the Republic of Nauru, the ISA (humankind), shareholders, countries hosting onshore processing facilities, and offshore contractors and service providers. No potential negative impacts on Developing Land-Based Producer States' (DLBPS) export earnings or economies. Delaying deep-sea research and mining industry in the Area governed by the ISA. No additional new source of critical metals required for transition to low-carbon economies.	Expansion of existing or development of new conventional mining projects, for example, in Indonesia or other emerging markets. Continued drive to develop DSM within national exclusive economic zones, subject to national jurisdictions (and not subject to multilateral ISA regime). DLBPS continue to be subject to global market forces, with no potential DLBPS compensation opportunities. Limited economic diversification and growth opportunities for Nauru. Limited supply of battery metals with growing demand, exacerbated due to geopolitical events (and potential sanction of Russia, a major nickel producer/exporter), driving up costs, including for electric vehicles, disproportionality impacting those with lower-income, and slowing down transition to low carbon economy.
Livelihoods	No locally based communities for the offshore operations site (no related +/- impacts). Onshore (brownfields?) impacts to be determined. Procurement benefits tied to US$7.2 billion CAPEX for Project. Total wages, benefits relatively smaller when compared to land-based mines.	No negative livelihood impacts, including none potentially relating to tourism, shipping, fishing. No +/- livelihood risks or impacts from offshore or onshore facilities.	Expanding existing or developing new conventional mines, and planned and unplanned riverine and coastal discharges, or dam failures, will generate related +/- livelihood impacts, including in places with less stringent requirements and controls. Supply shortage for cobalt may magnify artisanal mining and risk of child labor, and appears to be undermining "no

Category	With Project	No Project	Counterfactual
	Ecosystem services social impacts require further analysis, considering also scale of Pacific Ocean.		child labor" certification systems[59] in the cobalt supply chain in the African Great Lakes region, including the DR Congo.
Health and Safety	H&S risks need to be managed. The Project activities to date have an exemplary record: no (0) fatalities, no (0) lost time incidents from 2018 to 2021. No child labor risks.	No risks related to safety at sea, or on shore. No risk to community health & safety for onshore operations (ports, smelters).	The skilled professionals who would be employed by or contractors to the Project will likely move on to other projects/operations. New or expanding land-based mining projects would have relatively higher numbers of workers and community health & safety risks (incl. child labor risks) compared to NORI-D's largely robotic mining activities.
Marine Scientific knowledge	Ongoing $100 multi-year deep-sea research program involving leading research institutions retaining academic freedom, including freedom to publish results. Scientific knowledge generated, published.	Curtailment or cessation of industry-supported deep-sea research in largely inaccessible areas and depths.	Research may adjust, slow down, and/or shift to other areas and activities, including in national exclusive economic zones which will not have the multilateral distribution of the ISA.
Capacity Building	On-going capacity building and, training, valued particularly highly by Small Islands Developing States.	No ISA/DSM related capacity building/training initiatives. Capacity building mandate of the ISA will remain underfunded and underutilized.	Capacity building mandate of the ISA will remain underfunded and underutilized.
Climate Change	Tapping into the world's largest undeveloped nickel deposit will help address the surge in demand for battery metals. Diverse sources of metals will be needed for the transition to low carbon economies. Lower GHG intensive mining, products.	Growing deficit of battery metals, resulting in increasing costs for critical metals, adding barriers to transitioning to low-carbon economy, and mitigating the Climate Change crisis. Entrenching dependencies, geopolitical and supply chain risks.	Demand for battery metals met from other sources, with their own +/- impacts, with potential delays and increased costs to consumers. Supply barriers continue for foreseeable future, delaying more rapid response to Climate Change crisis.

[59] Global Witness, 2022. The ITSCI Laundromat, How a due diligence scheme appears to launder conflict minerals. April 2022

Category	With Project	No Project	Counterfactual
	Reducing additional stress on water-scarce regions for ore extraction. A Life Cycle Assessment (LCA) study shows that, when compared to nickel produced via terrestrial routes such as Pyro ferronickel Indonesia, Pyro conventional Australia and Hydro MHP Indonesia, the nickel produced from NORI-D exhibits approximately 94%, 78% and 68% lower Global Warming Potential respectively[60].	Continued reliance on high GHG intensity battery metals production.	Transitioning transport sector to EV potentially slowed down, including due to escalating cost, resulting in additional GHG emissions. Entrenching dependencies, geopolitical and supply chain risks. Continued and growing reliance on high GHG and water intensity battery metals production.

Source: Prizma and NORI

[60] Benchmark Minerals Intelligence, LCA for NORI-D Polymetallic Nodule Project, October 2022 -* BMI LCA Results are undergoing third party verification

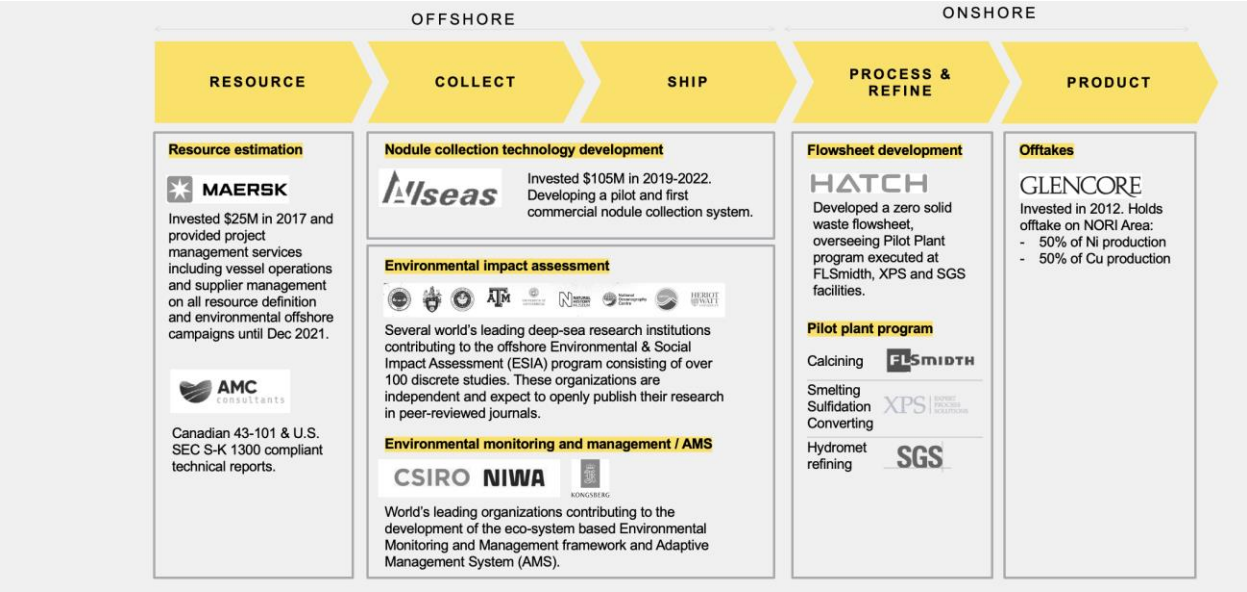
D. Onshore Infrastructure

As noted in Section IV.B above, the characteristics of deep-sea nodules, their collection and near-zero waste processing, does not require the construction of tailings storage facilities. However, other shore/land-based processing facilities will still be required. This may include, for example, construction of a dedicated hydro- and pyro-metallurgical processing facility, or use of spare capacity or modification of existing processing facilities.

As common to mining operations at the feasibility and impact assessment stage, NORI is still studying its strategic options (and related alternatives) for its significant onshore facilities for Project Zero and Project One.

The Project's options include leveraging its existing partnerships identified below.

Figure 9: Leveraging business and other partnerships for offshore and onshore activities



Source: TMC

In March 2022, TMC announced[61] that it entered into Business Collaboration Memorandum of Understanding with Epsilon Carbon, India's leading producer of graphite materials for lithium-ion battery anodes with ambitions to enter cathode material production, to complete a pre-feasibility study for the world's first commercial polymetallic nodule processing plant in India. Epsilon Carbon intends to deliver a pre-feasibility report for a plant in India powered by renewables and with a targeted processing capacity of 1.3 million tonnes per annum of wet nodules.

[61] https://investors.metals.co/news-releases/news-release-details/metals-company-enters-business-collaboration-mou-epsilon-carbon

In addition to exploring plant sites based on proximity to markets for byproducts, site selection is also expected to be based on access or proximity to renewable energy.

Table 6: Example of preferred options for selection of port facilities

Criteria	Preferences
Access to Power	Access to low carbon options, preferably hydroelectric
Distance to RKEF	Minimize need for haul trucks or rail transport
Material handling	Capability to load/unload shipments and store materials
Port size	Port size must be considered to determine size of ships that can deliver nodules
Access to markets	Proximity to markets for by-products
Geopolitical	Government partnership opportunities
ESG	Alignment with TMC's ESG values and commitments

VI. Regulatory Context

A. UNCLOS & ISA

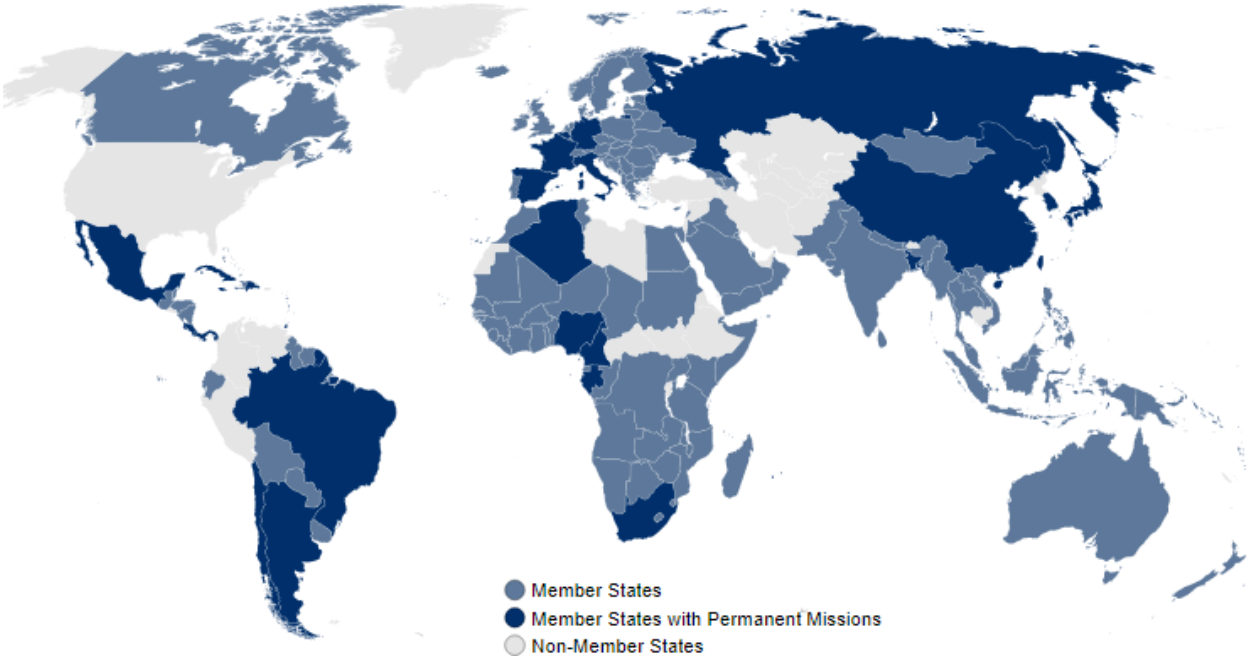
Exploration and exploitation of seabed minerals in international waters (The Areas Beyond National Jurisdiction – often referred to as "The Area") is regulated by the International Seabed Authority (ISA). It is an autonomous intergovernmental organization enabled by the 1994 Agreement Relating to the Implementation of the United Nations Convention on the Law of the Sea (UNCLOS) (the 1994 Agreement). The ISA provides the first example of developing an international regulatory regime before an industry has started. The presence of deep-sea minerals was one of the major drivers of establishing international ocean laws and regulations, dating back to the 1950s and culminating in UNCLOS.

The ISA organizes and controls all mineral-resources-related activities in "The Area" (where UNCLOS applies) for the benefit of humankind. This also means that the ISA does not organize, regulate or control onshore facilities or activities which fall within the jurisdiction of their host countries.

The ISA, headquartered in Jamaica, is financed and governed by 167 Member States, including all Pacific Small Island Developing States (see below), and the European Union.

As of 5 August 2022, ISA has 99 observers, including 37 non-governmental organizations (NGOs), which are listed in Annex 4, speaking to ISA's efforts aimed at transparency and engagement.

Image 3: Member States of the International Seabed Authority



Source: ISA at https://www.isa.org.jm/index.php/member-states

Box 1: The Common Heritage of Humankind (CHH)

The Common Heritage of Humankind (CHH) principle represents the notion that certain global commons or elements regarded as beneficial to humanity as a whole should not be unilaterally exploited by individual states or their nationals, nor by corporations or other entities, but rather should be exploited under an international arrangement or regime for the benefit of humankind as a whole. The application of the CHH concept is particularly important as our population and use of resources grow, and the world faces significant challenges, such as climate change.

This CHH principle is contained in UNCLOS[1], which governs the Area – the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction – and embraces the goal to contribute to the realization of a just and equitable international economic order that takes into account the interests and needs of humanity as a whole and, in particular, the special interests and needs of developing countries.

While there is no concise fully agreed upon definition of CHH, there are core elements of how to manage global commons and these are used in UNCLOS.

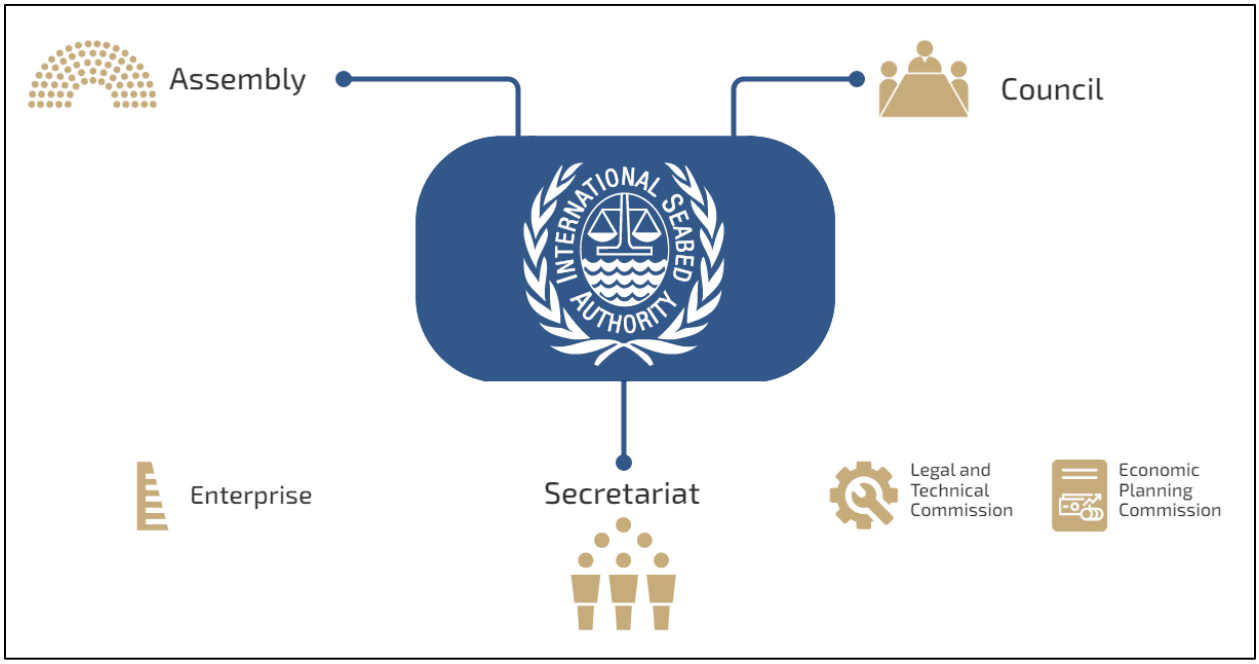
- **Non-appropriation**: No state or person can claim sovereignty or sovereign rights over any area deemed CHH or its resources.
- **Cooperative management**: The use of CHH shall be carried out in accordance with a system of cooperative management for the common good.
- **Sharing of benefits**: There will be an active and equitable sharing of benefits (including financial, technological, and scientific) derived from activities in an area deemed CHH.
- **Peaceful purposes**: The use of resources deemed CHH are reserved for non-military uses.

Source: modified from Oxford Bibliographies

B. Key ISA Organs

The key organs of the ISA are depicted in Figure 10, which is followed by a brief summary of their roles.

Figure 10: The Organs of the International Seabed Authority



Source: ISA, accessed December 6, 2022

Assembly - it comprises all members (167 States and the European Union), serves as the supreme organ, and establishes the general policies of the ISA. The power of the Assembly includes election of the members of the Council (see further below) and other bodies, as well as appointing the Secretary-General, sets ISA's two-year budgets, the rates by which Members contribute towards the budget using the assessment scale established by the United Nations for that body's activities. Following adoption by the Council, the Assembly approves the rules, regulations and procedures that ISA, including those which govern prospecting, exploration and exploitation in the Area.

Council – serves as the executive organ of the ISA, comprises 36 members elected by the Assembly, and stablishes specific policies in conformity with UNCLOS and the general policies set by the Assembly. The Council supervises and coordinates implementation of the regime established by UNCLOS to promote and regulate exploration for and exploitation of deep-sea minerals. The Council's tasks include approval of contract applications, overseeing implementation of the contracts, and establishing environmental and other standards. In cases where an environmental threat arises from seabed activities, the Council may issue emergency orders to prevent harm, including orders to suspend or adjust operations. The Council will also assume additional responsibilities once deep-sea mining commences, including action (including compensation) to protect land-based mineral producers in the developing countries from adverse economic effects of seabed production.

Secretariat – is the third principal organ of the ISA, headed by the Secretary General. The Secretariat's function includes implementation of the work programs and policies laid down by the

other principal organs and their subsidiary bodies, ensuring compliance with plans of work for exploration and exploitation contracts. The Secretariat includes an Office of Environmental Management and Mineral Resources (OEMMR), which provides scientific and technical input into the development and implementation of the rules, regulations and procedures for the conduct of activities in the Area. The OEMMR also supports the development and implementation of regional environmental management plans, environmental impact assessment and environmental monitoring, and the development of environmental standards and guidelines.

Legal and Technical Commission (LTC) – it currently comprises 30 members elected by the Council for a 5-year period. During the ISA's 27th session, a council decision was announcing relating to members of the elected members to the LTC for the new five-year period of 2023-2027[62]. 41 LTC members were selected for this new period, will commence in January 2023. The LTC reviews applications for plans of work, supervision of exploration or mining activities, development of environmental management plans, assessment of the environmental implications of activities in the Area, formulate and keep under review the rules, regulations, and procedures in relation to activities in the Area, and make recommendations to the Council on all matters relating to exploration and exploitation of non-living marine resources. In March 2019, the LTC submitted the Draft regulations on exploration of mineral resources in the Area to the Council for its consideration. The LTC is currently developing standards/guidelines for the exploitation activities in the area, as a priority matter.

C. Pacific Small Island Developing States

The United Nations recognizes 42 Small Island Developing States (SIDS). These are considered vulnerable due to their isolation, exposure to climate risks, and dependency on imports[63]. A sub-group of SIDS, the Pacific Small Island Developing States (PSIDS) are all voting members of the ISA (see Table 7). This means that they are informed, can directly represent their interests (including those related to intangible cultural heritage associated with the Pacific Ocean), and participate in ISA's governance structures.

Several PSIDS have become sponsors under the ISA regime for exploration activities in the Area. As shown in Table 5, two PSIDS have nominated representatives to serve as independent experts at ISA's Legal and Technical Commission (LTC).

In addition, several PSIDS, such as Cook Islands, Fiji, and Papua New Guinea, are also engaged in deep-sea mining exploration activities within their own Exclusive Economic Zones (EEZ), which are not subject to ISA's multilateral regulatory regime.

[62] ISBA_27_C_41_Add_1.pdf (isa.org.jm)
[63] https://www.un.org/ohrlls/content/small-island-developing-states

Table 7: All Pacific Small Island Developing States are ISA Members

PSIDS	ISA Member	ISA Legal and Technical Commission (LTC) 2023-2027[64]	Sponsorship in ABNJ
Cook Islands	Yes		Cook Islands Investment Corporation
Micronesia	Yes		
Fiji	Yes	Yes	
Kiribati	Yes		Marawa Research and Exploration Limited
Nauru	Yes		Nauru Ocean Resources Inc (NORI)
Niue	Yes		
Palau	Yes		
Papua New Guinea	Yes		
Marshall Islands	Yes		
Samoa	Yes		
Solomon Islands	Yes		
Tonga	Yes	Yes	Tonga Offshore Mining Limited (TOML)
Tuvalu	Yes		
Vanuatu	Yes		

Sources: https://www.isa.org.jm/member-states and LTC membership: https://www.isa.org.jm/index.php/authority/legal-and-technical-commission (accessed December 5, 2022); EEZ – Exclusive Economic Zone, ABNJ – Areas Beyond National Jurisdiction (subject ISA's regulatory regime), PSIDS - Pacific Small Island Developing States, ISA LTC – ISA's Legal and Technical Commission (30 members)

D. Land-Based Producer States

With reference to UNCLOS Articles 150 (h) and 1 (3), the 2020 Lapteva *et al.*'s study[65] produced for the ISA indicates that UNCLOS requires that developing States must be protected "from adverse effects on their economies or on their export earnings resulting from a reduction in price of an affected mineral, or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area…". The study concluded that, for all demand growth scenarios considered for copper, nickel, and cobalt, the production by even 12 contractors would not exceed the expected demand growth. However, production of six contractors would exceed the demand growth scenarios for manganese. The same study identified a list of the Potentially Vulnerable Land-Based Producer States. Prizma's review of this list shows that, with two exceptions (Eritrea and Peru), all identified States are members of the ISA and, therefore, also involved in its governance (see Table 8)[66].

[64] PSIDS were also represented during the LTC membership period of 2017-2022
[65] Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020
[66] ISA membership source: https://www.isa.org.jm/member -states (accessed 5/12/2022)

Table 8: Land-Based Producer States potentially impacted by PMN production in the Area

Country	Products' share in export revenues	Products' share in GDP (%)	ISA Member
Exporters of copper products			
Zambia	56.1	18.7	Yes
DR Congo	55	11.1	Yes
Eritrea	50	5.6	No
Chile	48.9	12.8	Yes
Laos	34.4	7.7	Yes
Mongolia	26	15.9	Yes
Peru	25.8	5.1	No
Exporters of nickel products			
Madagascar	20.3	3.7	Yes
Zimbabwe	15.6	3.1	Yes
Exporters of cobalt products			
DR Congo	24.3	4.8	Yes
Exporters of manganese products			
Gabon	21.9	5	Yes
Cumulative effect of exports of all affected metals			
Mauritania	12	4.8	Yes
Namibia	11.4	4.9	Yes
Papua New Guinea	10.6	4.3	Yes

Source: See Table II. Countries exporting copper, nickel, cobalt and manganese products which are likely to be most seriously affected by seabed production, in Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020; ISA membership source: https://www.isa.org.jm/member-states (accessed 5/12/2022)

E. ISA's Legal & Technical Commission

ISA's Legal and Technical Commission (LTC) is an organ of the Council of ISA. It consists of 30 members who are elected by the Council for a period of 5 years from among the candidates nominated by the member States. The LTC will increase in size to 41 members for the period of 2023-2027. LTC's functions includes supervision of exploration or mining activities, developing environmental

management plans, assessing the environmental implications of activities in the Area, formulating, and reviewing the rules, regulations, and procedures in relation to activities in the Area, and making recommendations to the Council on all matters relating to exploration and exploitation of non-living marine resources (such as PMN). As shown in Table 7, the active participation of the Pacific Small Island Developing States includes the election of two of their representatives to the LTC.

F. ISA's Regional Environmental Management Plans

As part of its mandate, the ISA has developed and periodically reviews regional environmental management plans (REMPS) – including for the CCZ[67] - to ensure the protection of the marine environment. The ISA lists the objectives of these REMPS as follows:

- Provide the relevant organs of ISA, as well as contractors and their sponsoring States, with proactive area-based and other management tools to support informed decision-making processes that balance resource development with conservation.
- Provide ISA with a clear and consistent mechanism to identify areas thought to be representative of the full range of habitats, biodiversity and ecosystem structures and functions within the relevant management area.
- Provide those areas with appropriate levels of protection.
- Help ISA meet globally agreed goals and targets, such as the ones set out by the 2030 Agenda and in particular Sustainable Development Goal 14 (Life below water).

For the CCZ, following a workshop on the CCZ biodiversity synthesis[68], the ISA expanded the designated Areas of Particular Environmental Interest (APEI), which are effectively "no mining areas", from 9 to 13 in December 2021 (see Figure 3). The APEI's nearest to NORI's contract areas are also shown in Figure 3.

G. ISA Exploration Contracts

The ISA grants contracts to sovereign states, state enterprises, or to private contractors who are sponsored by one or more sovereign states. The Enterprise, also an ISA organ (not fully operational at this time), may also carry out activities, such as transporting, processing, and marketing of minerals recovered from it, on behalf of all Members of ISA and subject to the directives and control of the Council.

The ISA requires that a contractor must obtain and maintain sponsorship by one or more of the Member States of the ISA (and signatory to UNCLOS), and such nation(s) must maintain effective supervision and regulatory control over such a sponsored contractor.

The ISA Member States which have sponsored exploration activities in the CCZ include Belgium, Bulgaria, Cook Islands, Cuba, China, Czech Republic, France, Germany, Jamaica, Japan, Kiribati, Nauru (which is NORI's Sponsor), Poland, Russian Federation, Singapore, Slovakia, Tonga, United Kingdom of Great Britain, and Northern Ireland.

[67] https://isa.org.jm/minerals/environmental-management-plan-clarion-clipperton-zone
[68] https://isa.org.jm/event/deep-ccz-biodiversity-synthesis-workshop

The ISA has issued a total of 19 polymetallic nodule exploration contracts covering approximately 1.28 million km^2, or 0.4 percent of the global seafloor. Of these contracts, 17 are located in the CCZ, which has a width comparable to the continental USA. Three of the contracts in the CCZ are affiliated with TMC, which includes NORI.

H. ISA's Regulatory Regime

The "Mining Code" refers to the whole of the comprehensive set of rules, regulations and procedures issued by ISA to regulate prospecting, exploration, and exploitation of marine minerals in the international seabed Area, or the "Area" (defined as the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction). According to the ISA[69,70], exploration regulations covering the prospecting and exploration for polymetallic nodules was initially adopted in 2000 and revised in 2013. In 2014, the ISA began to develop regulations to govern the exploitation of mineral resources in the Area with a series of scoping studies. The aim of the exploitation regulations is to balance economic needs with rigorous environmental protection.

Once in place, the regulations will require any entity planning to undertake activities in the international seabed area to abide by stringent environmental requirements. The regime to be established also requires a portion of the financial rewards and other economic benefits from mining to be paid to the ISA, most of which will then be shared according to "equitable sharing criteria" (see below). Draft exploitation regulations have been prepared following a multi-year, transparent process, and involving public consultations. The negotiations to finalize the regulatory regime are on-going.

The ISA's exploitation regulations was expected to be finalized by July 2020. Due to COVID-19 disruptions, this date shifted to July 2023 after Nauru utilized Article 15 of the 1994 Agreement. With regards to (environmental and) social impacts and benefits, the draft regulations refer to, inter alia, the IFC Performance Standards on Environmental and Social Sustainability, and the Equator Principles, which are benchmarks for determining, assessing, and managing environmental and social risk in projects. It is expected that the ISA will carefully consider and balance environmental, social, and economic effects of each exploitation application, also taking into account stakeholder input, before making a decision.

A series of other relevant conventions, standards and guidelines focused more on the marine aspects of the Project are tabulated in Annex 3. The evolving regulatory regime of the ISA includes rules and procedures for managing future nodule collection revenues and economic contribution. This includes royalties and other payments made to the ISA by operators working under exploitation contracts. The ISA is also evaluating different formulas for equitable sharing of financial and other economic benefits generated from the Area. Relevant aspects for this SIA Scoping Document are described further below.

[69] https://www.isa.org.jm/mining-code

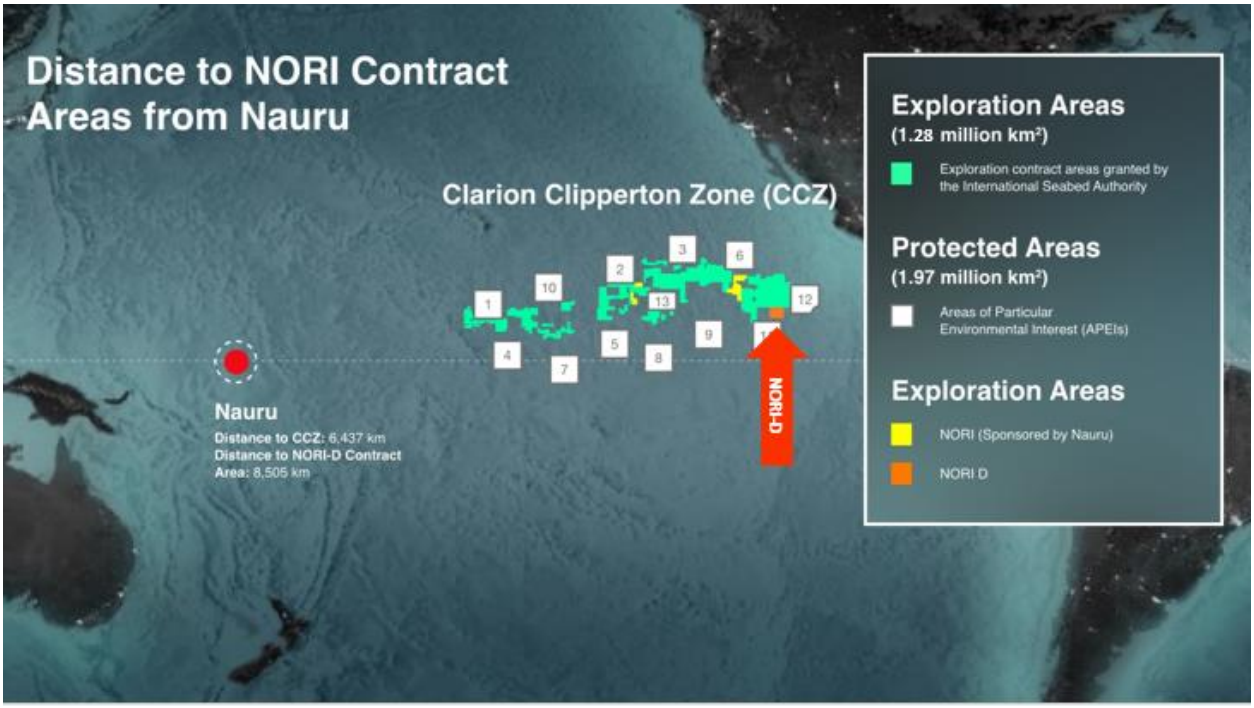
[70] ISA, 2021. Status of the draft regulations on exploitation of mineral resources in the Area and proposed road map for 2022 and 2023, Report of the Secretary-General, available here: https://isa.org.jm/files/files/documents/ISBA_26_C_44-2112033E.pdf

I. The Republic of Nauru

Nauru is the ISA Member State Sponsor of NORI, and a Project beneficiary, as described further below. This island nation is the first sponsoring state to access the land bank created by the ISA to provide developing states with the opportunity to participate in this industry. Nauru views PMN as an opportunity to diversify its economy and contribute to the transition to clean energy.

Nauru is the world's smallest island country (21 square kilometers), has a population of approximately 12,500, and is located northeast of Australia in southeastern Micronesia in the Central Pacific Ocean. As illustrated in Figure 11, Nauru is located at a distance of approximately 6,500 km to the CCZ and over 8,500 km from the NORI-D Project. There will be no Project-related nodule collection activities, processing, or infrastructure at or near Nauru.

Figure 11: Location of Nauru



Source: TMC, Map identifies Protected Areas within the CCZ and designated by the ISA. Nearest other protected area outside of the CCZ is Clarion Island. It is located at a distance of approximately 700 km from NORI-D and is part of Mexico's *Archipiélago de Revillagigedo*, a UNESCO World Heritage Site

According to its government publications[71], Nauru's 2021-22 budget recognized expected revenues of AUS$244.1 million (approximately US$ 183.5 million) and expenditure of AUS$244.0 million (approximately US$153.5 at 3 Nov 2022 foreign exchange rates). Approximately 25 percent of Nauru's

[71] https://naurufinance.info/2021-22-budget/?msclkid=6e14ed72b05811eca30e683bf6364e6f accessed March 30, 2022

revenues are related to fisheries. Nauru also received non-tax revenues, such as Hosting Fees to accommodate refugees on behalf of Australia (approximately US$25.6 million projected for 2020-2021).

According to the Green Climate Fund, because of its isolated position in the Pacific, Nauru depends significantly on its port for supplies of food, energy, and most other essentials. However, the port is expected to become inoperable for longer periods every year due to the impact of sea level rise and increased intensity of climate-related events such as strong storms and cyclones. Supported by grants from the Green Climate Fund (US$26.91 million), the Asian Development Bank and related trust funds (US$24.30 million), the Government of Australia (US$14.08 million), and additional parallel financing by the Government of Japan to provide port equipment, a climate-resilient port development is underway at Nauru. This development is expected to be completed by mid-2022[72].

Other grant-funded programs include the 2021 Asian Development Bank's approval of a $5 million project readiness facility to finance the assessments, planning, and capacity building for the proposed Nauru Sustainable Urban Development Project. The ensuing project is expected to help improve household water supply, sanitation, and solid waste management[73].

In 2015, Nauru enacted the International Seabed Minerals Act[74]. It established the Nauru Seabed Minerals Authority (NSMA) to lead and administer Nauru's sponsorship of activities carried out in the Area by companies sponsored by Nauru. To manage future revenues related to deep-sea mining, Nauru also established its Seabed Minerals Fund. In 2015, Nauru also established the Nauru International Trust Fund[75] to contribute to the long-term budgetary self-reliance of Nauru. The aim was to have a trust fund provide supplementary funds to the budget as of 2030, mainly to replace dwindling phosphate royalty revenues. As of 30 June 2020, the value of the fund was $140 million, an increase of $28 million over the year[76].

In relation to the NORI-D Project, Nauru, the NSMA, and NORI entered into a sponsorship agreement in 2017 formalizing certain obligations of the parties in relation to NORI's exploration and potential exploitation of the NORI contract areas. Upon reaching a minimum recovery level within the exploitation contract area, NORI will provide a payment to Nauru linked to nodules recovered from the exploitation contract area. In addition, NORI pays an annual administration fee to cover costs incurred by Nauru administering the Agreement. This agreement is subject to periodic review and the payable fees are indexed to adjust for inflation.

NORI-D integrated project is estimated to be USD 9.2 billion in taxes over lifetime of the project. A share is attributable to offshore nodule collection and transport.

J. IFC Performance Standards

Based on the Project Description and other information reviewed, Prizma's preliminary screening categorized the NORI-D Project to be an "A-level" project in terms of the IFC Performance Standards

[72] 48480-003: Sustainable and Climate-Resilient Connectivity Project (formerly Port Development Project) | Asian Development Bank (adb.org)
[73] https://www.adb.org/sites/default/files/publication/27748/nau-2021.pdf
[74] https://www.isa.org.jm/files/documents/EN/NatLeg/Nauru_ISM.pdf
[75] https://naurufinance.info/intergenerational-trust-fund/
[76] https://naurufinance.info/wp-content/uploads/2020/07/background_web_2019_itfn_with_grey_background.pdf

and Equator Principles. This is a category typically assigned to new mining projects, or many other types of offshore energy or renewable power projects. A category "A" designation means that the Project is deemed to feature potentially significant adverse environmental and social risks and/or impacts that may be diverse, irreversible, or unprecedented, and for which an ESIA-type study is required.

Prizma's preliminary screening of the Project also suggests that while all Performance Standards may be applicable to this Project and/or certain– currently undefined – future onshore components, the Project may have impacts which must be managed in a manner consistent with the following IFC Performance Standards:

- **PS 1** - Assessment and Management of Environmental and Social Risks and Impacts
- **PS 2** - Labor and Working Conditions
- **PS 3** - Resource Efficiency and Pollution Prevention
- **PS 4** - Community Health, Safety and Security (mainly for onshore facilities)
- **PS 6** - Biodiversity Conservation and Sustainable Management of Living Natural Resources

A justification why, using a conventional interpretation, PS 5, PS 7, and PS 8 are not deemed applicable – or not at this time - is provided below.

- **PS 5 - Land Acquisition and Involuntary Resettlement**

  Affected Communities in the context of mining projects may include those affected by economic dislocation or physical resettlement, or affected by significant impacts from, for example, emissions or effluents. Located in the CCZ, in the Pacific Ocean, approximately 700 km from the Clarion Island, and approximately 1,700 km from Mexico's mainland, there are no residents, landowners, or users at the nodule collection site. Considering distances involved and, for example, dissipation effects they contribute to, it is reasonable to assume that potential environmental effects of NORI-D in the CCZ will not likely generate significant adverse livelihood effects. This means that Performance Standard 5 is not deemed to be triggered at this time. However, the applicability of PS 5 will need to be revisited once further data is available, including data relating to effects from, for example, sediment plumes, and siting decisions relating to onshore facilities have been made.

- **PS 7 - Indigenous Peoples**

  The IFC Performance Standard 7 notes that "Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-Indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases."

  Prizma notes that a 2016 UNESCO study[77] underlines the intrinsic relationship that many Indigenous Peoples have with the oceans, seabed, and environs. Pacific islanders are

[77] Toki, Valmaine, 2016. Study on the relationship between Indigenous peoples and the Pacific Ocean, UN Permanent Forum on Indigenous Issues at https://digitallibrary.un.org/record/822537?ln=en

described as guardians or custodians of the oceans. Some view deep-sea mining in the context of nuclear testing, driftnet fishing and bottom trawling, and marine pollution, and indicate a need for Free, Prior, and Informed Consent (FPIC)[78]. The literature also highlights that Indigenous Peoples (and other local communities) have been underrepresented in the debate about the governance of oceans and their natural resources beyond national jurisdiction, and ability to inform strategies for conservation, sustainable and equitable use of marine species in general[79].

Prizma also notes that the potentially most vulnerable Pacific Small Island Developing States (PSIDS) are voting members of the ISA. This means that they participate in ISA's governance, shape and determine the applicable regulatory regime, and will determine if an application for exploitation in the Area should be approved or declined. Some PSIDs are also Sponsors of activities in the Area (such as Nauru sponsoring NORI, and being a beneficiary) and/or pursue deep-sea mining within their Exclusive Economic Zones (EEZ, meaning within their own jurisdiction). The latter includes the Cook Islands. It sponsors activities within the CCZ[80] and, at the same time, pursues DSM opportunities within their sovereign EEZ[81]. Conversely, Tuvalu, also a PSIDS, recently rescinded its sponsorship for deep-sea mining exploration in the CCZ[82].

Also, some Indigenous Peoples, including some based in Hawaii (USA is an Observer at the ISA and not a member), Mexico or Canada (both ISA members), may not feel fully represented at the ISA, even though the ISA's provides for public participation opportunities which are open to all interested parties. In addition, the ISA, which emerged pursuant to the UNCLOS convention, maintains a structure which includes 99 observers, including 30 observer States (such as the USA), 32 intergovernmental organizations (including numerous UN agencies and multilateral development banks), and 37 non-governmental organizations (NGOs)[83].

Prizma's preliminary screening, using a conventional application (interpretation) of the IFC PS 7, takes into account that the Project's nodule collection area is located offshore, approximately 700 km from the Clarion Island (uninhabited except for a naval base[84]) and approximately 1,700 km from Mexico's mainland. This suggests that the NORI-D contract area does not feature the presence of Indigenous People or their territories, and currently available information does not suggest transformation, encroachment, and significant degradation of their lands and resources. These factors indicate that PS 7 (and the related Free, Prior, and Informed Consent (FPIC) requirements applicable under certain circumstances) is not triggered by the Project at this time.

However, the applicability of PS 7 will need to be revisited and validated once further data will become available relating to, for example, the effect of sediment plumes or other impacts which will be assessed during the pilot Collector Test and the Project's ESIA, and/or siting decisions for onshore facilities. NORI-D's engagement and planned public consultation is

[78] https://www.pacificblueline.org/pacific-blue-line-statement
[79] See, for example, Marjo K. Vierrosa, et al., 2020. Considering Indigenous Peoples and local communities in governance of the global ocean commons. Marine Policy, Volume 119, September 2020, 104039 at https://www.sciencedirect.com/science/article/pii/S0308597X19309212
[80] https://isa.org.jm/files/files/documents/Public%20information%20on%20contracts%20CIIC.pdf
[81] https://www.sbma.gov.ck/phases-of-sbm-activity
[82] https://dsmobserver.com/2022/05/tuvalu-cancels-its-sponsorship-the-role-of-international-law/
[83] https://www.isa.org.jm/index.php/observers
[84] https://whc.unesco.org/en/list/1510/multiple=1&unique_number=2102

designed to be inclusive and encourage the participation of Indigenous Peoples, Pacific islanders, and other interested stakeholders.

- **PS 8 - Cultural Heritage**

  The intrinsic relationship that Indigenous Peoples have with the oceans and the participation of PSIDS as members of the ISA and its governance is noted further above. Prizma's preliminary screening of the Project suggests that, as commonly interpreted and applied, IFC PS 8 does not appear to be triggered by the NORI-D's off-shore activities in the CCZ. Here, the Project is not expected to affect cultural heritage, including cultural resources, knowledge, innovations and/or practices of local communities embodying traditional lifestyles, nor plans to commercialize intangible cultural heritage. The applicability of PS 8, including in relation to future shore-based facilities, will need to be reviewed once their physical locations have been identified.

  ISA's regulations require immediate notification if human remains and objects and sites of an archaeological or historical nature are identified in the Area (Regulations 8 and 35)[85]. Also, the ISA, which defines mineral resources in the Area as "Common Heritage of Humankind" has already conceptually defined approaches for equitable sharing of economic and other benefits derived from deep-seabed mining[86].

[85] https://isa.org.jm/files/files/documents/isba-19c-17_0.pdf
[86] See ISA Policy Brief 01/2022 on Equitable sharing of financial and other economic benefits from deep-seabed mining

VII. Key Stakeholders

NORI defines its stakeholders as any interested individual or organization. NORI is committed to robust and representative stakeholder and community participation, as well as inclusive and transparent sharing of information. NORI acknowledges the dynamic nature of its stakeholder landscape (and that of deep-sea mining more generally). Stakeholder mapping and the overall engagement plan will be regularly reviewed to ensure that they are up to date, and engagement methods and strategies are fit for purpose.

In line with these commitments, NORI adopted a phased approach to the SIA process, including a Scoping process to engage and consult stakeholders, so that they can contribute to the design of the TOR and help shape the SIA study (see also Figure 1 in Section I), which will also be subject to its own engagement and consultation.

The following IFC principles of engagement[87] will also be applied during the life of the Project and will serve as the basis for stakeholder engagement:

- Provide meaningful information in a format and language that is readily understandable and tailored to the needs of the target stakeholder group(s);
- Provide information in advance of consultation activities and decision-making;
- Disseminate information in ways and locations that make it easy for stakeholders to access it;
- Respect local traditions, languages, timeframes, and decision-making processes;
- Establish two-way dialogue that gives both sides the opportunity to exchange views and information to listen and to have their issues heard and addressed;
- Seek inclusiveness in representation of views, including women, vulnerable and minorities;
- Adopt processes free of manipulation interference, intimidation, or coercion and free of charge for participation;
- Develop clear mechanisms for receiving, documenting, and responding to people's concerns, suggestions, and grievances; and
- Incorporate feedback into project or program design and report back to stakeholders.

With these principles in mind, the overall objective of the Project's stakeholder engagement activities is to keep stakeholders informed with respect to their specific interests and maintain stakeholder confidence and trust in the Project and its activities through open, informative, inclusive, and timely communications.

The expectation is that this will be achieved by building on the relationships established during the SIA phase and making appropriate adjustments that are consistent with the changing Project status, including Project-related activities, affected communities, stakeholder perceptions and interests, and reporting needs.

[87] See Stakeholder Engagement: A Good Practice Handbook for Companies, Doing Business in Emerging Markets, International Finance Corporation, 2007

A draft Stakeholder Engagement Plan (sometimes also referred to as Public Consultation and Disclosure Plan or PCDP) will be included as an annex to the Terms of Reference or be part of the draft SIA, which will be subject to public consultation.

Table 9: Examples of stakeholder segments which will be considered in the SIA

Segment	Definition or description
Stakeholders[1a, b]	ISA: "Stakeholder" means a natural or juristic person or an association of persons with an interest of any kind in, or who may be affected by, the proposed or existing Exploitation activities under a Plan of Work in the Area, or who has relevant information or expertise. IFC: Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses.
Affected Communities[2]	Are local communities within the Project's area of influence, directly affected by the Project.
Pacific Small Island Developing States	This group comprises Cook Islands, Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. All are members of the ISA.
Developing Land-Based Producer States (DLBPS) [88]	The ISA[3] is mandated to allocate revenues to establish an Economic Assistance Fund to assist developing countries which suffer serious adverse effects on their export earnings or economies resulting from a reduction in the price of an affected mineral or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area.

Source: 1a – ISA's Draft regulations on exploitation of mineral resources in the Area (ISBA/25/C/WP.1), 1b - IFC Performance Standards on Environmental and Social Sustainability (2012), Stakeholder Engagement: A Good Practice Handbook for Companies, 2 – Equator Principles (EP4); 3 - ISA Policy Brief 01/2022 om Equitable Sharing of Financial and Other Economic Benefits from Deep Sea Mining.

A broader list of key stakeholders to consider has been suggested for deep-sea mining projects by Steven Katona *et al*[89], which is presented in Table 9. The identified listing essentially comprises the entire human population around the world. This list will be further reviewed to arrive at a practicable engagement and consultation strategy for the Project, prioritizing the potentially most significantly and adversely affected stakeholders, and any associated vulnerable groups.

[88] See also Table 8 above

[89] Steven Katona, et al, 2021. Ethical opportunities in deep-sea collection of polymetallic nodules from the Clarion-Clipperton Zone, Integrated Environmental Assessment and Management

Table 10: Stakeholders to consider in an ethical discussion of CCZ nodule collection

Stakeholder Categories	Stakeholder Segments
International and State Actors	
Governments and international authorities with a vested interest in DSM and ABNJ or lack thereof	• ISA and ISA member states • Countries sponsoring the ISA exploration contracts • Coastal countries which may develop processing plants • Developing countries which may benefit from ISA royalties • Countries currently involving in mining the same minerals on land • Countries with downstream participation in the metal industry • Countries interested in rare earth metals • Public authorities regulating environmental and social issues
Supply Chain	
Companies. Any companies affected by introduction of nodule metals or lack thereof	• Companies mining or producing class 1 nickel, cobalt, manganese, copper • Nodule-collector operators and producers • Product manufacturers, e.g., battery cells, manganese alloy products • Supply-chain actors, e.g., material and energy input and service providers, suppliers of machinery, systems, and other equipment, transport
Individuals, Local, or Special Interest	
Interest Groups. Advocacy groups, NGOs, experts, universities, and groups and coalitions focused on environmental, social and economic impacts	• Universities and scientific ecosystem including marine and terrestrial ecologists, industrial ecologists, climate scientists, data-based policy advocates • Ecosystem-preservation groups and conservationists • Climate change advocates • Waste reduction, recycling, circulate economy advocates • Child labor, labor standards advocates • Indigenous rights advocates and representatives • Organizations concerned with the rights and prosperity of developing nations
Communities. Groups directly or indirectly affected by the CCZ nodule collection or expansion of terrestrial mining	• Residents living in proximity to mines, processing plants, tailings dams • Developing-country communities dependent on mining income • Communities of child and artisanal laborers • Indigenous communities • Supporting ecosystems of metal-production value chain
Individuals. People directly or indirectly affected by CCZ nodule collection or expansion of terrestrial mining	• Consumers of products containing these metals • Individuals affected by climate change, water use, pollution, etc. • Miners, construction workers, nodule-collection workers, engineers, employees

Source: Steven Katona, et al, 2021. Ethical opportunities in deep-sea collection of polymetallic nodules from the Clarion-Clipperton Zone, Integrated Environmental Assessment and Management, Figure 2

VIII. Consultation Process

A. SIA Scoping Consultation

As already noted in Section I, the purpose of this Scoping Document is threefold:

1. Inform stakeholders about the planned NORI-D Project.
2. Solicit stakeholders' input in designing the TOR for the Project's SIA study.
3. Demonstrate that the Project has engaged with stakeholders to consider and incorporate their perceptions, expectations, and concerns into the Project's SIA process.

This Scoping document is expected to be published in December 2022. A series of virtual and in-person engagements and consultation activities are being planned and will be announced. Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[90], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

As depicted conceptually in Figure 12, the key outcome of the *Scoping phase* will include the following outputs: a Summary Record of Scoping (includes summary of comments received and how they have been assessed), and the TOR for the Project's SIA study.

Figure 12: Outcome of SIA Scoping includes Record of Scoping and TOR for SIA Study

Source: Prizma, SIA - Social Impact Assessment, TOR – Terms of Reference

Planned engagement and consultation activities for the *SIA Scoping phase* include the following:

1. Engage the Republic of Nauru and the ISA about scoping the SIA.
2. Disclose and promote the Scoping Document via social media channels and informational webinar(s) for a minimum of 30-day public consultation period.
3. The Republic of Nauru will invite the ISA to circulate the Scoping Document to its Member States, Observers and other stakeholders.
4. Conduct stakeholder meetings where possible on the sidelines of (a) ISA's meetings in Jamaica and respond to other events/opportunities to which NORI may be invited to contribute.

[90] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

5. Engage the Republic of Nauru and the ISA about public comments received, results of scoping, and emerging TOR for the SIA.
6. Publish a Record of SIA Scoping (includes summary of comments received), and TOR for the SIA study.
7. The Republic of Nauru will invite the ISA to distribute public comments received, Record of SIA Scoping, and TOR for the SIA to its Member States, Observers, and other stakeholders.
8. Conduct a webinar to present outcome of scoping process, including summary of public comments, TOR and next steps relating to the SIA study and its engagement activities.

Stakeholders should be aware that the views they contribute during consultation events for the SIA Scoping phase will inform and help design the TOR for the SIA. It will not restrict their ability to provide further comments at later stages, including during the SIA study. Also, it is understood that stakeholder participation does not imply consent for the Project. NORI-D's overall stakeholder engagement process is designed to be iterative, continuous, and will not end with the SIA process.

B. Future SIA Study Consultation

Later on, in the *SIA phase*, the SIA will also be subject to public consultation, as depicted conceptually in Figure 13. The outcome of the SIA will be integrated into an EIS, which is required by the ISA as part of NORI's exploitation application for the Project.

Figure 13 SIA study will also be subject to engagement and consultation

Source: Prizma; SIA – Social Impact Assessment, TOR – Terms of Reference

As outlined in ISA's Template Table of Contents for an EIS[91], the Project's planned SIA will describe the obligation, goals, nature, methods, extent and outcome of disclosure and consultation activities with interested stakeholders. A summary of the stakeholders' key concerns and comments, and how these will be addressed, will also be provided. In addition, plans for continuation of the consultation process will be outlined.

NORI plans to submit its application for an exploitation contract for the NORI-D Project in H2 2023. This will also require the submission of an EIS to the ISA for approval. This will include the key findings of the SIA.

[91] See ISBA/25/C/WP.1, Section 13. Consultation, 13.1 Consultation methods, 13.2 Stakeholders, 13.3 Public consultation and disclosure, and 13.4 Continuing consultation and disclosure

C. Examples of Past Engagement and Consultation

NORI conducted a global stakeholder consultation workshop in Q1/2020 to inform both the Collector Test EIA and the ESIA for the operational phases. The workshop was held in San Diego, US, from 5-6 February 2020 (see Figure 18), shortly before the outbreak of the COVID-19 pandemic. Over 55 stakeholders attended the two-day event in person, and a further 20 attended remotely. Additional stakeholders were invited to attend and chose not to participate. Workshop participants came from over 20 countries. With the exception of concerns about deep-sea mining's potential adverse impacts in terms of closures and job losses for land-based mines, no specific social issues were identified by participants.

Figure 14: Participants at the conclusion of the global stakeholder workshop in San Diego in 2020

Source: NORI

NORI's Collector Test EIS was submitted to the ISA on 29 July 2021 and released for public comment soon thereafter. A public stakeholder workshop was conducted on 5 October 2021 which described the EIA process; after which written comments were submitted to NORI until 19 November 2021. A total of 632 comments were received[92,93]. Social concerns raised include lack of a "social license", concerns about costs/impacts to Pacific Island communities, potential loss of ecosystem services (such as fisheries production), and inadequate stakeholder consultation. The Collector Test EIS was updated in response to public comments. The EIS document was also reviewed by a Certified Environmental Impact Assessor who confirmed that the EIS methodology and processes applied are consistent with good international industry practice.

[92] Comments were received from the Federal Republic of Germany, Deep-Ocean Stewardship Initiative, Deep Sea Conservation Coalition, Deep Sea Mining Campaign, Mining Watch Canada, Government of the United Kingdom, The Pew Charitable Trusts, the United States Government, and 10 submissions from individuals via website portal.

[93] https://bit.ly/3VGDeOg

After reviewing the updated EIS, the ISA – and other stakeholders - requested additional monitoring information from NORI for the Collector Test. In early April 2022, approximately 30 scientists from around the world, NSMA, and the ISA Secretariat met in London, UK (see Figure 15) to finalize an updated monitoring plan.

Figure 15: Scientists gathering to develop more detailed monitoring plans for Collector Test

Source: TMC

On November 1, 2022, during the ISA Council 27th session Part III in Kingston, Jamaica, NORI hosted a side event and presentation[94] on Integrated Ecosystem Assessment and Ecosystem Based Management Framework for Polymetallic Nodule Mining in the CCZ. This presentation was delivered on behalf of consortium led by CSIRO[95], Australia's national science agency and innovation catalyst. Other consortium members conducting the associated research include the Griffith University, the Museum of Victoria, NIWA, and the University of Sunshine State. This research is designed to assist with the development of environmental impact statement, and monitoring and management of mining operations, if approved by ISA.

[94] https://metals.co/download/238783/?tmstv=1667848562

[95] https://www.csiro.au/en/about/We-are-CSIRO

Figure 16: CSIRO presentation during a side event of the ISA Council meeting in November 2022 in Jamaica

Source: TMC, CSIRO - The Commonwealth Scientific and Industrial Research Organisation, an Australian Government agency responsible for scientific research.

D. Grievance Management

The IFC PS1 identifies the need to establish a Grievance Mechanism, noting that "[w]here there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project and have Affected Communities as its primary user. It should seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible, and at no cost and without retribution to the party that originated the issue or concern. The mechanism should not impede access to judicial or administrative remedies. The client will inform the Affected Communities about the mechanism during the stakeholder engagement process.[96]" IFC-compliant grievance mechanisms also cover topics ranging from labor to resettlement.

A core element of NORI's Stakeholder Engagement Plan is the Grievance Management Process. This process involves:

- Established functions at the Project-level;
- A readily accessible and comprehensible service for stakeholders;
- The receipt, acknowledgement, and management (including closure) of concerns from external stakeholders:

[96] IFC, 2012. IFC Performance Standards on Environmental and Social Sustainability, at 15

- Confidentiality provisions; and
- Provisions of separation, whereby experienced and qualified personnel responsible for the managing the Grievance Management Process are separate from the personnel in charge of management and business activities.

The Grievance Management Process will be included in the draft Stakeholder Engagement Plan attached as an annex to the draft SIA and subject to public consultation.

IX. Impacts to be Described or Studied in SIA

A. Introduction

Scoping is the process of identifying and prioritizing the key issues associated with a project, and the extent to which they need to be investigated (studied) as part of the SIA. The purpose of this Scoping Document is to support an engagement and public consultation process designed to assist NORI (and its consultant) to scope the planned SIA for the NORI-D Project.

The key outcome of the scoping phase will include a Summary Record of Scoping which includes the feedback received from the public consultation process and the resulting Terms of Reference (TOR) for the Project's SIA study. Key issues identified from, for example, a review of ISA's emerging requirements, are outlined below. These may be validated or adjusted, and/or additional issues may emerge from the public consultation process, as well as further discussions with Nauru, the ISA, and other stakeholders.

Unless the ISA provides a TOR for NORI-D's SIA, NORI's consultant, Prizma, will generate the TOR. This will also take into account the result of the engagement and public consultation process associated with the SIA's scoping phase. The TOR will be further validated in discussion with NORI, Nauru and the ISA, and published by NORI.

The TOR is expected to include the following sections:

- Background
- Objectives
- Applicable Standards
- Scope of Work
- Structure of SIA
- Provisional Schedule

These will incorporate the results of the engagement and public consultation outcomes for the scoping stage of the SIA.

A. Identification of Key Issues

The ISA's Draft regulations on exploitation of mineral resources in the Area identifies topics which should be covered in the EIS (see also ISBA/25/C/WP.1: Draft regulations on exploitation of mineral resources in the Area, and ISBA/27/C/5: Draft guidelines for the preparation of environmental impact statements). Those with a socio-economic and socio-cultural dimension are identified further below, along with additional topics emerging from Prizma's research.

In its review, Prizma considered that the siting of various Project facilities will likely be disbursed around the world. For example, relevant sites may include a third-party manufacturing site/shipyard in the Netherlands to convert drill ships, nodule collection activities conducted in the open oceans of the CCZ, use of owned or leased brownfield port and warehousing facilities in Mexico, and construction of a nodule processing facility in India.

Prizma used its team's experience and conducted additional research to identify potentially relevant social topics which may need to be highlighted in this Scoping Document and potentially covered in the SIA. This includes a review of social impacts, processes, changes, risks, and indicators commonly associated with mining projects (see Annex 6 and Annex 7).

Prizma's initial review contained in these annexes shows that most of the social changes, processes, and impacts highlighted in the literature for conventional (land-based) mining projects do not appear to be triggered by or are not particularly relevant, transferable, or significant to the Project. This is largely due to lack of presence of any local communities within hundreds of kilometers of the nodule collection site. See also Prizma's discussion in section VI.H of this document which highlights the intrinsic relationship that Indigenous Peoples have with the oceans, seabed, and environs, notes that Pacific Small Island Developing States (PSIDS) are members of the ISA and participate in its governance, and that - based on Prizma's preliminary screening – the IFC Performance Standards 7 (Indigenous People) and 8 (Cultural Heritage), do not appear to be triggered by the Project – or not at this time.

While the preliminary review suggests that many typical social impacts do not appear to be relevant, transferable or significant, the designation of the resource as the "Common Heritage of Humankind" (see also Box 1) and that the deep-sea mining industry in the ABNJ is new and may require a broader perspective to be applied. Also, other – more typical - social impacts may become relevant once the onshore facilities for downstream activities (such as processing) have been identified.

B. Workforce, Safety & Security

The Project's offshore nodule collection operation requires approximately 650 workers, including back-to-back shifts, and three collection vessels. MARPOL and related requirements, which cover good international management and safety practices for vessel operations (ranging from waste to safety at sea), will apply to NORI's offshore operations.

In September 2022, International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW) and The Metals Company (TMC) announced that they have entered into a labor neutrality agreement to bolster the critical mineral supply chain and to lay the groundwork for sustainable production of electric car batteries while creating a path to more good union jobs in the United States.[97]

Additional and possibly larger and temporary workfare may be required to construct and/or operate onshore facilities, unless tolling arrangements and/or existing "brownfield" processing sites or smelters are selected as suitable alternatives. The indicative size of the workforce required for for on-shore facilities is approximately 1,650. Related social risks may need to be reviewed at a future date in relation to the onshore facilities.

As part of the SIA, the general size and nature of the workforce will be characterized. Capacity-building objectives and commitments will also be highlighted. The relevant health and safety aspects, and broader labor policies and commitment (such as those related to IFC Performance Standards 2) will

[97] https://uaw.org/uaw-reaches-card-check-neutrality-agreement-metals-company/

be reviewed and characterized. Also, the security and human rights context of the Project will be considered and evaluated.

B. Fishing, Tourism & Scientific Research

NORI-D is not located in the way of any global shipping lanes. NORI has not been informed of any existing or planned telecommunication cables within the NORI-D contract area which would need to be protected. Based on observations of ISA contractors, the frequency of vessel passage and commercial fishing in the CCZ is considered low. There are also no known tourism-related activities in the Project area, and no significant tourism is expected at onshore, industrial ports or manufacturing sites (assumed industrial and brownfield context) to be used by and for the Project.

Similar to other offshore operations, such as fishing, wind farms, and oil and gas developments, the safe operation of NORI-D will require a safety zone around its vessels and related activities, and adherence to standard maritime navigational protocols and radio communications to avoid risk of collision. In addition, sediment plumes generated at (a) the seafloor, and (b) sea water return at approximately 1,200 meters below surface (to be tested and confirmed during collector testing in Q4/2022), may potentially have adverse effects, which is being tested and monitored during the Collector Test. Any such linkage to socio-economic receptors will be a focus of the SIA.

The SIA will also describe potential impacts and issues related to scientific research in the Area, Project-related risks, or opportunities.

C. Other Social Effects Linked to ESS

ISA guidance, which refers to the IFC Performance Standards and the Equator Principles, and good international practice drives the approach adopted to evaluating the potential risks and impacts on Ecosystem Services (ESS) from the proposed Project. Applying IFC's guidance[98], the SIA will focus on risks/benefits that people and businesses (or socio-economic receptors) obtain from the ESS.

Each phase of the NORI-D Project (Collector Test, Project Zero, and Project One) may have a different ESS footprint, although the approaches to assessing ESS-related social impacts are expected to be largely the same, as are the predicted applicability and linkages. Additional information pertaining to ESS are expected to emerge from the Collector Test and the operational EIA and will support the SIA to assess the social risks and benefits.

As detailed further in Annex 8, the SIA will consider the following ESS:

- Provisioning ESS (capture fisheries and seafood) with potential for negative effects from the Project, requiring further review and analysis of pending data from Collector Test and operational EIA;

[98] "Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services." Source: IFC Performance Standards: Guidance Note 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources. January 1, 2012.

- One Regulating ESS (climate regulation), on balance, with potential positive effects from the Project, and potential broad scale benefits to various socio-economic receptors;
- One Cultural ESS (scientific exploration, education) with a potential positive effect from the Project and limited direct socio-economic receptors (in addition to benefits for humankind); and
- Two Supporting ESS (nutrient capture, recycling, and primary production) with uncertain and potential low effects considering protected designated "no mining" areas, limited linkages to socio-economic receptors.

Selected ESS are also highlighted in other IFC Performance Standards, such as PS-3 (climate change aspects); PS 4 (Community Health and Safety); PS-5 (possibly for land-based activities); PS-7 (natural resources important to Indigenous Peoples); and PS 8 (cultural heritage).

D. Product Stewardship

The SIA will provide a brief description of relevant product stewardship aspects related to the Project (as defined by the ISA, see also section IV.F below). This means a brief description of transshipment of nodules from the collection site to onshore and – likely - "brownfield" port and warehousing facilities, and onwards transshipment for, at least initially, processing by existing "brownfield" RKEFs. It is assumed that any future construction of nodule processing facilities will be subject to their host country regulatory and permitting requirements (and not the ISA), and would also be expected to be designed to meet Good International Industry Practice (for example, the IFC Performance Standards and Equator Principles, as may be applicable).

E. Impacts on Nauru and ISA

The commercial collection of nodules will result in significant Project revenues, including revenues to be distributed to Nauru, and those which accrue to the ISA. The latter will also be subject to ISA's distribution of excess revenues for the benefit of humankind. The scale and opportunities/risks associated with such new resources will be reviewed as part of the SIA.

F. Impacts on Developing Land-based Producers

The ISA's instruments include setting up and allocating revenues derived from the Area to an Economic Assistance Fund, and assist developing countries which suffer serious adverse effects on their export earnings or economies resulting from a reduction in the price of an affected mineral or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area.

The 2020 Lapteva report[99] concluded that, for all demand growth scenarios studied for copper, nickel, and cobalt, the production by even twelve contractors would not exceed the expected demand growth. However, production of six contractors would exceed the demand growth scenarios for manganese.

[99] Lapteva et al, 2020. Study of the Potential Impact of Polymetallic Nodules Production from the Area on the Economies of Developing Land-based Producers of those Metals which are Likely to be Most Seriously Affected, Advanced unedited version, dated May 12, 2020

At this time, only NORI has publicly indicated plans to submit an exploitation application in the near future (H2 2023). Such an application requires submission of a mining plan, a financing plan, successful nodule collector testing, an operational EIS, and other components.

Further discussions with the ISA will be required to confirm any need for follow-up studies by the ISA (or other parties) considering that only six contractors (NORI, BGR, GSR, NIOT, UKSR, and TOML) appear to have sufficiently advanced their activities to be reasonably considered potential applicants for exploitation approvals in the CCZ over the next 5-year period.

G. Cumulative Social Effects

The ISA provides limited guidance about the need for and approach to cumulative effects or impact assessment. In 2021, the ISA reviewed its progress in the implementation of the operational aspects of the environmental management plan for the CCZ[100]. Action items identified by and for the ISA related to cumulative assessment are shown in Table 11, suggesting that no cumulative impact assessment (CIA) may be required until an exploitation application has been submitted. Further clarification on this topic will need to be sought during engagements with the ISA.

[100] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

Table 11: Action items for the ISA Secretariat relating to cumulative assessment for the CCZ

Index	Objective	Status	Further actions
O2	Undertake cumulative environmental impact assessments as necessary based on exploitation proposals	Not yet applicable - There have been no submissions of an Application for exploitation in the CCZ	Undertake an expert workshop or workshops and/or studies to assess cumulative environmental impact assessments in the CCZ, including qualitative modelling approaches, building on experience from those undertaken as part of regional environmental management plan workshops for the northern Mid-Atlantic Ridge and Pacific Northwest regions
M2	Consider the cumulative impacts of mining and other human activities	Not yet applicable – same as O2	Same as O2 (above)
P5	The secretariat will complete a CIA for seabed mining in the CCZ	Not yet applicable - Same as O2	Same as O2 (above)

Source: ISA Table 1 in Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone Report and recommendations of the Legal and Technical Commission, ISBA/26/C/43 at https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

However, the draft ISA regulations and guidance (ISBA/25/C/WP.1 and ISBA/27/C/5) identifies and implies the need for assessing cumulative impacts. Good International Industry Practice would also suggest the need to consider cumulative impacts as part of the E/SIA processes.

Given the Project's location and context, it is assumed that the valued social components (including ecosystem services) to be considered for a cumulative impact assessment are listed in Table 12.

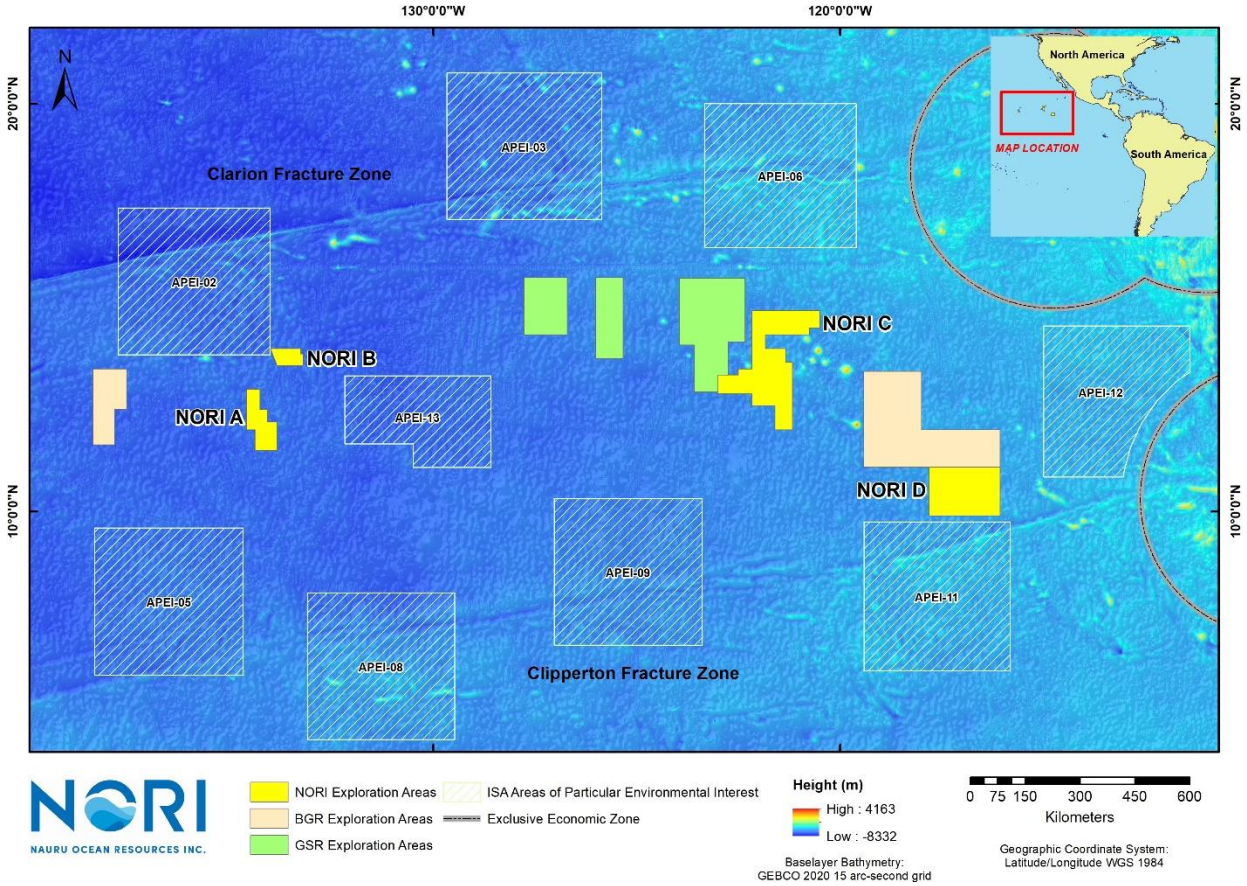
Table 12: Assumed valued social components to consider for consultation on cumulative assessment

VSC	ESS	Spatial Boundary	Temporal Boundary
Migratory marine species	Provisioning Cultural	Migratory regions, PSIDS	TBC
Climate Change (carbon sequestration, sea level rise, climatic events)	Regulating Supporting	CCZ or global abyssal planes, PSIDS region	TBC
Climate Change impact of Project (emissions, avoidance)	Regulating Supporting	PSIDS region or Global	TBC
Volume and price of battery metals	Provisioning	DLBPS (global commodity markets)	TBC
Benefits for humankind (revenues, knowledge, training)	Provisioning	CCZ, PSIDS (global distribution)	TBC
Other	TBC	TBC	TBC

Source: Prizma, DLBPS – Developing Land-Based Producer States, ESS – Ecosystem services, PSIDS – Pacific Small Island Developing States, TBC – To be confirmed, VSC -Valued social component, the list of VSC and their spatial and temporal boundaries are indicative.

Two key cumulative impacts scenarios may need to be considered. First, the phased expansion and vertical integration of NORI's Project Zero into Project One. Second, the development of additional nodule collection operations by NORI (other blocks) or other contractors in the CCZ.

Figure 17: Location of NORI, BGR, GSR Contract areas in the CCZ



Source: NORI (with shape files from the ISA), BGR - German Federal Institute for Geosciences and Natural Resources, GSR - Global Sea Mineral Resources (sponsored by Belgium).

Relevant other major developments which may significantly affect valued social components potentially affected by the Project may also be considered. These may include, for example, other planned deep-sea mining operations, commercial illegal fishing operations, and shipping traffic affecting migratory marine species. In addition, Global Warming and its impacts may also need to be considered.

H. Other Topics

The objective of the public consultation for the scoping of the SIA is to obtain stakeholder input to help validate and/or identify additional social risks/opportunities which should be considered when developing the TOR and conducting the SIA study.

X. Methodology For Impact & Risk Assessments

The ISA's Legal and Technical Commission's draft guidance (ISBA/25/C/WP.1 and ISBA/27/C/5) contains a table of content for an EIS, which are reproduced below. Key terms and their definitions or ISA expectations are shown in Table 13. Key ISA terms and expectations relevant to the SIA are contained in Table 14. The draft regulatory regime also includes references to the IFC Performance Standards and the Equator Principles. The SIA will characterize both positive and negative effects.

Table 13: Draft ISA Template for a Table of Content of an EIS

Section	Heading
ES	Executive Summary
1.	Introduction
2.	Policy, legal and administrative context
3.	Description of the proposed development
4.	Description of the existing physicochemical environment
5.	Description of the existing biological environment
6.	Description of the existing socioeconomic environment
7.	Assessment of impacts on the physicochemical environment and proposed Mitigation
8.	Assessment of impacts on the biological environment and proposed Mitigation
9.	Assessment of impacts on the socioeconomic environment and proposed Mitigation
10.	Accidental events and natural hazards
11.	Environmental management, monitoring and reporting
12.	Product stewardship
13.	Consultation
14.	Glossary and abbreviations
15.	Study team
16.	References
17.	Appendices

Source: ISA, 2019. Draft regulations on exploitation of mineral resources in the Area Prepared by the Legal and Technical Commission ISBA/25/C/WP.1 and ISA, 2022. Draft guidelines for the preparation of environmental impact statements Prepared by the Legal and Technical Commission

Table 14: Key ISA terms and expectations relevant to the SIA

Topic	Brief definition, description, or expectation of the ISA
Cumulative impacts*	The nature and extent of any interactions between various impacts, where they may have cumulative effects, must be considered on both spatial and temporal scales over the lifetime of the mining operation. ISA's documents[101] imply that the ISA will conduct such a study.
Description of the proposed development	Provide details of the proposed development activity, including relevant diagrams and drawings. It is understood that most projects will likely involve the recovery of minerals from the Area, with the concentrating process(es) occurring on land within a national jurisdiction (outside the jurisdiction of the ISA). While it is expected that this section would provide a brief description of the entire project, including offshore and onshore components, the Environmental Impact Statement should focus on those activities occurring within the ISA's jurisdiction (e.g., activities related to the recovery of the minerals from the Area up to the point of trans-shipment).
Environmental Effect	Means any consequences in the Marine Environment arising from the conduct of Exploitation activities, whether positive, negative, direct, indirect, temporary or permanent, or cumulative effect arising over time or in combination with other mining impacts.
EIA	"Environmental impact assessment (EIA)" is the process of identifying, predicting, evaluating and mitigating the physicochemical, biological, socioeconomic and other relevant effects of development proposals prior to major decisions being taken and commitments made. This includes all potential effects, both positive and negative, and encompasses natural and anthropogenic receptors.
Fisheries*	A description of potential impacts and issues to be addressed, along with proposed management measures and a description of residual impacts.
Marine traffic*	A description of potential impacts on non-project-related marine traffic occurring within the project area, along with proposed management measures and a description of residual impacts.
Product stewardship*	Provide a brief description of the intended use of the mineral-bearing ore once it leaves the Area. The description should also address the meeting of standards for environmental management. The intention is not to provide a full and highly detailed account, but, where information is known about environmental impacts, these impacts should be described briefly here.

[101] https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf

Topic	Brief definition, description, or expectation of the ISA
Serious Harm	Means any effect from activities in the Area on the Marine Environment which represents a significant adverse change in the Marine Environment determined according to the rules, regulations and procedures adopted by the Authority on the basis of internationally recognized standards and practices informed by Best Available Scientific Evidence.
Sites of an archaeological or historical nature*	List any sites of archaeological or historical significance that are known to occur within the potential area of impact.
Stakeholder	Means a natural or juristic person or an association of persons with an interest of any kind in, or who may be affected by, the proposed or existing Exploitation activities under a Plan of Work in the Area, or who has relevant information or expertise.
Socioeconomic and Sociocultural issues*	This section will provide a description of economic benefits or impacts, including any applicable social initiatives.
Summary of existing sociocultural environment*	A table may be a useful summary format. Potential cumulative effects should also be included
Standards	Means such technical and other standards and protocols, including performance and process requirements, adopted pursuant to [ISA] regulation 94.
Tourism*	A description of potential impacts and issues to be addressed, along with proposed management measures and a description of residual impacts.

Source: ISA 2019 Draft regulations on exploitation of mineral resources in the Area, prepared by ISA's Legal and Technical Commission (ISBA/25/C/WP.1). * Terms or headings used in ISA's guidance related to the EIS Template

According to IFC's Guidance, for "certain projects, and particularly for greenfield investments and projects (including, but not limited to, major expansion or transformation-conversion activities) involving specifically identified physical elements, aspects and facilities that are likely to generate potentially significant adverse environmental and social risks and impacts, the client [developer] should conduct a comprehensive full-scale ESIA. The key process elements of an ESIA generally consist of (i) initial screening of the project and scoping of the assessment process; (ii) examination of alternatives; (iii) stakeholder identification (focusing on those directly affected) and gathering of environmental and social baseline data; (iv) impact identification, prediction, and analysis; (v) generation of mitigation or management measures and actions; (vi) significance of impacts and evaluation of residual impacts; and (vii) documentation of the assessment process (i.e., ESIA report)" [102]. This general process and associated methodologies will be followed for the Project's SIA.

To facilitate engagement and public consultation, the Scoping Document includes a high-level Project Description and relevant context. The Project's spatial and temporal boundaries, and its socio-economic area of influence will be further analyzed and characterized. The Project's social area of

[102] IFC Guidance Notes: Performance Standards on Environmental and Social Sustainability, January 1, 2012, at 10

influence - considering its unique nature - will be further defined, taking also into account the results of the monitoring gathered during the Collector Test (expected in Q4/2022), the on-going environmental assessment, planned discussions with the Republic of Nauru and the ISA, and comments received during the public consultation process.

Key sources of risks and their predicted impacts (which can also be positive), and their differentiated burden (or benefit) on social receptors will be identified and segmented using characteristics such as type, extent, duration, reversibility, scale, and frequency, before ranking them by significance. This process will also consider health, safety and labor issues, and cumulative social impacts.

Rating of significance is typically expressed in terms, such as negligible, minor, moderate, or major, as illustrated below, based on criteria which will be defined for key social aspects of the Project during the SIA process. The rating will consider social receptors, contextual issues, and variability of value (importance) which may be assigned by different stakeholders to the same topic or impact. The SIA will also highlight significant data gaps or uncertainties if they would materially affect the risk ratings.

Figure 18: Commonly used ESIA impact evaluation matrix

Severity of Impact	Magnitude of Potential Impacts							
	Adverse Impacts				Beneficial Impacts			
		Major	Moderate	Minor	Negligible	Minor	Moderate	Major
	High	Major	Major	Moderate	Negligible	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Negligible	Minor	Moderate	Major
	Low	Moderate	Minor	Negligible	Negligible	Negligible	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

The SIA will also consider how to apply the mitigation hierarchy, which prioritizes actions ranging from avoidance to compensation. The SIA will use the emerging findings to develop and propose appropriate social mitigation measures and outline key performance indicators and social management plan(s). These will be developed in a participatory way with relevant/affected receptors. Significant residual social risks will also be identified and characterized.

In line with IFC guidance[103], a cumulative social impact assessment will also be conducted, considering valued environmental and social components identified by key stakeholders and their relevance to the Project. The approximate temporal boundary is expected to include the life of the Project (2046) and/or the Paris Agreement's net-zero milestone of 2050. Spatial boundaries will need to consider the emergence of other deep-sea mining operations within the CCZ. A preliminary analysis of indicator examples contained in the IFC's guidance note on cumulative impact assessment, along with a preliminary analysis to explore if/how they may be relevant to the Project, are presented in Annex 8.

[103] IFC, 2013. Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

A framework approach, such as commitments to relevant IFC Performance Standards and host country requirements, or inclusion in social action plan, may need to be applied when certain physical aspects – such as site-based decisions about onshore processing facilities – are insufficiently defined to allow a meaningful assessment of social risks or impacts.

Annex 1: Prizma's Key Contributors to this Scoping Document

Mr. Mehrdad Nazari is Prizma's Team Leader and Project Manager for the NORI-D SIA assignment. He has over 25 years of experience, worked on over 150 projects in nearly 50 countries. This includes 10 years at the European Bank (EBRD) in London, where he focused on complex extractive projects. His advisory practice focusses on mining, renewable power, and private equity. He has contributed to Independent Engineer/Monitoring Groups, delivered courses on the IFC Performance Standards and the Equator Principles, and has been appointed to the E&S Expert Rosters at the grievance mechanisms of two multilateral financial institutions. Mr. Nazari studied geosciences in Germany (BSc-equivalent, Mineralogy, J.W. Goethe), USA (German Fulbright grantee at UW-Milwaukee) and the UK. He holds an MSc in Hydrogeology (University of Birmingham), completed Sustainability Studies through the Rockefeller Foundations Leadership for Environment and Development program, and obtained his MBA at Henley Business School in the UK. Mehrdad is an AccountAbility licensed AA1000AS assurance service provider, and a Mining Association of Canada (MAC) certified Towards Sustainable Mining (TSM) Verification Service Provider. He is also a member of the International Association for Impact Assessment (IAIA), and resides in Wisconsin, USA.

Dr. William Kennedy, a recipient of an IAIA Lifetime Achievement Award, has over 35 years of international experience, and is an Associate of Prizma. He served as an Administrator at the Environmental Directorate of the OECD, Paris, was a Senior Program Officer at the UNEP in Kenya, and headed Policy and Strategy at EBRD's Environmental and Sustainability Unit in London. He also served as Executive Director of the Commission for Environmental Cooperation of North America in Montreal, was an EIA Advisor to the US Millennium Challenge Corporation, a Board Member at the IAIA, an Adjunct Professor (Geography), Concordia University, Montreal, and a Senior Associate at UNEP-McGill Collaborating Center on Environmental Assessment, Montreal. Dr. Kennedy currently serves as a part-time Director, Office of Accountability, at the US Development Finance Corporation (formerly OPIC). His degrees include an MPA from the University of Colorado Boulder, and a PhD in Environmental Policy from the Freie Universität Berlin, Germany. Dr. Kennedy resides in Montreal, Canada.

Dr. Don Proebstel is a Conservation Biologist and a long-term Associate of Prizma with over 25 years of international professional experience, including as VP Environmental & Sustainability at Gold Reserve Inc., directing the ESIA/ESMS and developing NGO partnerships for the $650 million gold-copper project in Venezuela; Senior Environmental & Social Analyst with the US Overseas Private Investment Corporation (OPIC, now DFC); Senior Analyst Pike Research (now Navigant Research); and Senior Environmental Analyst at AATA International. Dr. Proebstel attended the 1992 Rio Conference, Convention on Biodiversity and follow-up UNEP COP meetings, including Curitiba Brazil (COP-8, 2006) and the IUCN World Conservation Congress in Hawaii in 2016. Dr. Proebstel is also a Director at Natural Power Concepts, which is involved in the development of advanced renewable energy technology solutions. Based in Hawaii, he has worked with/developed and secured funding from the US Air Force Research Laboratory (AFRL) and also with the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii-Manoa. Early in his career, he served as the Director, World Salmonid Research Institute, and as a Senior Research Advisor, Wild Salmon Center, where he participated in ten annual river expeditions to Siberia and Kamchatka. Dr. Proebstel's academic degrees include a B.S. Fishery Biology and a PhD. In Conservation Biology, Colorado State University. He is a Mining Association Canada-certified Towards Sustainable Mining Verification Service Provider. Dr. Proebstel is based in Hawaii.

Annex 2: Public consultation template for the SIA scoping stage of NORI-D

When preparing their comments, stakeholders are invited to consider the goals and objectives of the Scoping Document to generate the Terms of Reference for the Social Impact Assessment study for the NORI-D Project. The Scoping Document is designed to provide a Project Description and its context to be enable relevant agencies, potentially affected communities, and other stakeholders to identify and prioritize key social attributes or effects (both negative and positive), which should be considered or studied as part of the SIA study. The SIA study will also be subject to additional public consultation.

Readers are invited to submit their comments online at https://norisiascoping.paperform.co/ or https://metals.co/nori/. Alternately, a template is provided in Annex 2 which can be emailed as an attachment to stakeholders@nori.nr. For ongoing updates about the NORI-D project, readers are encouraged to visit NORI's website and social media[104], and subscribe to newsletters here: https://metals.us18.list-manage.com/subscribe?u=c025d3ca0d7fa4ca16d015990&id=4e5cf6ab35.

[104] https://www.facebook.com/NauruOceanResources/ https://twitter.com/nori_nauru?lang=en

Public consultation form for the SIA scoping stage of NORI-D

Instructions: Fill out and email as attachment to stakeholders@nori.nr with subject "SIA scoping consultation". An online version of this may also be filled out and accessed here.

Contact Information	
Last Name	
First name	
Name of Organization	
Type of Stakeholder*	
Country	
Email/contact details	
Request confidentiality (Y/N)	

List up to 5 social/cultural/economic attributes or receptors you believe could be negatively affected by the Project

List up to 5 social/cultural/economic attributes or receptors you believe could be positively affected by the Project

General Comments

Specific and Prioritized Comments		
Section or Topic	Page	Comment

* Type of stakeholder may include International and State Actors, Companies, Interest Groups, Communities, Individuals or Other (please specify), as categorized in Table 8

Annex 3: Other Relevant Convention, Protocols and Codes

CONVENTIONS, PROTOCOLS AND CODES	DESCRIPTION/IMPLICATIONS
Marine	
Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (1986), also known as the SPREP Convention or Noumea Convention.	Agreement for the protection, management, and development of the marine and coastal environment of the South Pacific Region and represents the legal framework of the Action Plan for managing the Natural Resources and Environment of the South Pacific adopted in 1982.
Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (1990) (Amendment) 2006	The objective of the protocol is to prevent, reduce and control pollution by dumping of wastes and other matter in the South Pacific.
International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004)	Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. The Convention requires all ships to implement a Ballast Water and Sediments Management Plan, and to carry a Ballast Water Record Book and are required to carry out ballast water management procedures to a given standard.
1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (as amended in 2006)	Article 1 Definitions Article 4.2 "Dumping" does not include: 4.3 The disposal or storage of wastes or other matter directly arising from, or related to the exploration, exploitation and associated offshore processing of seabed mineral resources is not covered by the provisions of this Protocol.
The International Marine Minerals Society's Code for Environmental Management of Marine Mining (2001)	The code anticipates and integrates environmental considerations for responsible marine mining. The Code seeks to complement national and international marine mining environmental regulations where they exist, and to provide environmental principles and guidelines where these are absent or could be improved.
Fauna and Flora	
Convention on Biological Diversity (1992)	The convention covers conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from using genetic resources, including on the deep seabed.
Memorandum of Understanding for Cetaceans and their Habitats in the Pacific Island Region (2006)	To provide an awareness of international responsibilities to conserve cetacean populations of the Pacific Islands Region, in particular, pursuant to the Convention on Biological Diversity (CBD) for which the Convention on the Conservation of Migratory

	Species of Wild Animals (CMS) is the CBD lead partner in the global conservation of migratory species over their entire range.
UNCLOS (article 145 Part XII) Protection of the Marine Environment	To ensure the marine environment and all species related are protected and that no harm comes to flora or fauna during human activities.
Climate	
Vienna Convention for the Protection of the Ozone Layer (the Vienna Convention) (1993) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1992)	To provide guidelines and protocols for the protection of the ozone layer on a global scale.
United Nations Framework Convention on Climate Change (1992)	An international environmental treaty providing guidelines and frameworks addressing climate change on a global scale.

Annex 4: Non-governmental Organizations with Observer Status at the ISA

According to the ISA[105], Observers are allowed to participate in the work of ISA's Assembly and the Council, subject to certain limitations. NGO Observers may sit at public meetings of the Assembly and, upon invitation from the President and subject to approval by the Assembly, may make oral statements on questions within the scope of their activities. Written statements submitted by NGO observers within the scope of their activities which are relevant to the work of the Assembly are made available by the Secretariat in the quantities in the languages in which the statements are submitted. All observers of ISA may designate representatives to participate, without the right to vote, in the deliberations of the Council, upon the invitation of the Council, on questions affecting them or within the scope of their activities.

Advisory Committee on Protection of the Sea
African Minerals Development Centre
Center for Oceans Law and Policy, University of Virginia School of Law
Center for Polar and Deep Ocean Development, Shanghai Jiao Tong University
Cluster maritime français
Committee for Mineral Reserves International Reporting Standards
Conservation International
Deep Ocean Stewardship Initiative
Deep Sea Conservation Coalition
Durham University's Centre for Borders Research
Earthworks
Fish Reef Project
Greenpeace International
Institute for Advanced Sustainability Studies
InterRidge
Interamerican Association for Environmental Defense
International Association of Drilling Contractors
International Cable Protection Committee
International Dialogue on Underwater Munitions
International Marine Minerals Society
International Ocean Institute
International Policy Laboratory of the Massachusetts Institute of Technology
Japan Agency for Marine-Earth Science and Technology
Law of the Sea Institute
Mining Standards International
OceanCare
Oceans North
Ocean Society of India
RESOLVE
Sargasso Sea Commission
Sasakawa Peace Foundation
The Ocean Foundation
The Pew Charitable Trusts
Thyssen-Bornemisza Art Contemporary
World Ocean Council
World Organization of Dredging Associations
World Wildlife Fund International

[105] https://www.isa.org.jm/observers?msclkid=393cbaccb68b11ecb6cbfc82380ecbbc accessed 4/7/2022

Annex 5: Changes induced by terrestrial mining that can lead to social impacts and risks

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Population and demographics	In-migration, out-migration, workers' camps, social inclusion, growth or decline of towns, conflict, and tensions between social groups	Not readily transferable to deep-sea nodule collection. Onshore activities require further definition and analysis.
Crime and social order	Corruption, domestic violence, sexual violence, substance abuse and trafficking, prostitution, change in social norms, pace of change for vulnerable communities	Not readily transferable to deep-sea nodule collection. No significant changes or risks expected. Onshore activities require further definition and analysis.
Culture and customs	Change in traditional family roles, changing production and employment base, effects of cash economy, reduced participation in civil society, community cohesion, sense of place, community leadership, cultural heritage	Not readily transferable to deep-sea nodule collection. Important cultural connection of Pacific islander with the ocean and its environs. No significant changes or impacts expected from the Project. Onshore activities require further definition and analysis.
Social infrastructure services	Demands on and investment in housing, skills (shortages and staff retention), childcare, health, education, and training	Not readily transferable to deep-sea nodule collection. No significant changes or impacts expected for Project. Onshore activities require further definition and analysis. Revenues accrued to the Republic of Nauru and ISA may enable additional investments into social infrastructure.
Community health and safety	Disease, vehicle accidents, spills, alcohol and substance abuse, pollution, interruption to traditional food supply, awareness, and treatment programs	Not readily transferable to deep-sea nodule collection. No significant changes or impacts expected for Project. Onshore activities require further definition and analysis.
Labor practices	Health and safety, working conditions, remuneration, right to assemble, representation in unions, labor force participation for women	Fully transferable to the Project.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Political	Pacific Island state government focus and resources on deep-sea mining, opportunity cost for other development options	May be transferable to deep-sea nodule collection. Foreign aid and fisheries dependent Republic of Nauru using DSM to diversify and increase revenue generation opportunities. Resources required covered by contractor. Other political issues may relate to campaigns and pressure targeting the Republic of Nauru by external parties, also other Pacific Islands. Onshore activities require further definition and analysis.
Human rights and security	States overriding community self-determination, suppression of opposition and demonstrations, targeting of activists, rights awareness programs	Not fully transferable to deep-sea nodule collection. NORI to develop appropriate policies, systems. Onshore activities require further definition and analysis. TMC's board strives to achieve gender parity. NORI committed to provide 50% training opportunities to women.
Gender and vulnerable groups	Disproportionate experience of impact and marginalization of vulnerable groups (e.g., women, disabled, aged, ethnic minorities, Indigenous, and young), equity in participation and employment	No local communities for deep-sea nodule collection. ISA-required capacity building provides opportunities, targeting also women. Onshore activities require further definition and analysis. TMC's board strives to achieve gender parity. NORI committed to provide 50% training opportunities to women.
Distribution of benefits	Employment, flow of profits, royalties and taxes, training, local business spending, community development and social programs, compensation, managing expectations, equitable distribution across state/regional/local/ethnic or family groups, cash economy	Planned benefit sharing with ISA and the Republic of Nauru. Nodule recovery payments to the Republic of Nauru to be paid into the Seabed Minerals Fund. ISA has developed conceptual methodology for equitable distribution. Considers also impacts on Developing Land-Based Producer States, including potential loss of revenues from their land-based mining operations due to deep-sea mining. Onshore activities require further definition and analysis. NORI maintains community/grants programs. ISA provides for capacity building.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Industry	Change in industry composition, dominance by foreign entities in a high-tech industry	Transferable to deep-sea nodule collection and NORI. Multilateral ISA centrally involved and regulating, except for Sponsorship arrangements involving ISA Member States. Impacts on Developing Land-Based Producer States considered. Onshore activities require further definition and analysis.
Inflation/deflation	Housing (ownership and rents), food, access to social services	The Republic of Nauru's legislation requires revenue from DSM to be placed into Seabed Minerals Fund, provides opportunity to manage for future generations and mitigate inflationary impacts. Revenues from nodule recovery to the Republic of Nauru indexed for inflation. Revenues for the Republic of Nauru could be earmarked for services/infrastructure and/or contribute to an existing trust fund. Onshore activities require further definition and analysis.
Infrastructure	Demands on and investment in ports, power, communications, and related infrastructure	Transferable to the Project. Onshore activities require further definition and analysis.
Pollution and amenity	Terrestrial, coastal (port and transport), surface (spills and transport), and deep-water (associated with mining activity) pollution	Transferable to Project, which is required to meet ISA/MARPOL/IFC PS/EHS Guidelines. Onshore activities require further definition and analysis.
Resettlement	Consent and consultation for resettlement, compensation, ties to land, adequacy of resettlement housing and facilities, equity, post-settlement conditions, livelihoods	Not transferable to DSM in CCZ. Onshore activities require further definition and analysis.
Disturbance	Disruption to economic and social activities (including by exploration), consultation for access, frequency and timing, compensation	Not relevant to deep-sea PMH collection activities in CCZ. Onshore activities require further definition and analysis.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
Resources (access/competition)	Marine resources, subsistence fishing, cultural practices, scarce infrastructure	Transferable to dep sea PMN collection and requires further analysis, although lack of local communities, depths, distances, etc. not indicative of significant social/livelihood impacts. Onshore activities require further definition and analysis.
Community engagement	Consultation, communication, participation, empowerment, access to decisionmakers, transparency, timing, inclusiveness (particularly for vulnerable and marginalized groups), respect for customs and authority structures, reporting	Generally transferable, although no local community present at deep-sea PMN collection site. Onshore activities require further definition and analysis. The context of Common Heritage of Humankind will need to be considered.
Consent	Cultural use of terrestrial and marine areas (free, prior, and informed consent), community consent	Dee sea PMN collection in the Area outside of national jurisdictions or Indigenous territories, no locally affected communities, no resettlements. Key Indigenous/Pacific islands, with strong cultural attachments to and reliant on Oceans, are members of the ISA. Onshore activities require further definition and analysis.
Participation	Planning, development of programs, monitoring, selection of alternatives and technologies, operational aspects	Transferable to deep-sea polymetallic nodule collection. Stakeholder engagement planned. Participatory approached planned for potentially significant adverse social impacts/opportunities. Onshore activities require further definition and analysis. The context of Common Heritage of Humankind (see also Box **1**) will need to be considered.
Remedy	Grievance and dispute resolution, acknowledgment of issues, compensation, mitigation	Transferable to deep-sea PMN nodule collection and onshore developments. Grievance mechanism part of stakeholder engagement plans.
Agreements	Equity, timely honoring of commitments, issues with delivery, duress, clarity of obligations, capacity, and	Transferable to deep-sea PMN nodule collection and future onshore facilities.

Type of Change	Concerns of Land Based Mining	Indicative relevance to NORI-D
	governance (including government capacity to respond to and manage change)	
Community development	Participation, adequacy, appropriateness, capacity to facilitate, consistency, prioritization	Transferable to deep-sea PMN nodule collection . NORI has programs in place in the Republic of Nauru (described in TMC's 2021 Impact Report). Onshore activities require further definition and analysis.

Source: Adapted from Roche C. and Bice, S, 2013. Anticipating Social and Community Impacts of Deep-Sea Mining, in SPC, 2013, in Deep Sea Minerals and the Green Economy. Baker, E., and Beaudin, Y (Eds) Vol 2, Secretariat of the Pacific Community. LBM – Land-based mining, DSM – Deep-sea mining

Annex 6: Indicators commonly used in social impacts assessment for the mining sector[106]

Impact category	Impact Topics	Preliminary analysis for the Project
Economy, income, and security	**Positive** • Income • Business **Negative** • Bribery • Thefts and accidents • Inequality • Social tension • Poverty	• Job creation opportunities (appr. 650 for Project One offshore nodule collection) • Ethics, taxation (royalties) dictated by ISA, host countries for future processing sites • Governance & disclosure requirements dictated by listing requirements, Participation in UN Global Compact • Benefit sharing negotiated with the Republic of Nauru • Equal opportunity is a material industry and ISA topic • Positive science/knowledge of deep-sea ecosystem • No local communities at deep-sea PMN nodule collection site (unknown for onshore/future sites) • More limited and disbursed boom/bust/social tensions (unknown for onshore/future sites • The context of Common Heritage of Humankind will need to be considered
Employment and education	**Positive** • Employment • Skills & education **Negative** • Child/Forced labor • Poor working conditions • Lack of freedom to organize • Temporary jobs • Unemployment	• Job creation opportunities (Offshore nodule collection: Project One approximately 850 total: 650 collector vessel; 200 transport vessels) • Unknown employment/training for onshore or processing facilities • ISA-required training targeting developing countries • No risks related to child/forced labour, artisanal mining • High quality working/contracting conditions, no “flag of convenience” for marine operations • IFC PS2/freedom of association applies • More limited and disbursed construction boom/bust and temporary jobs

[106] Source if Impact Category and Topic: Mancini, L. and Sala, S., 2018. Social impact assessment in the mining sector: Review and comparison of indicators frameworks. Resources Policy, Volume 57, August 2018, Pages 98-111 (see Table 2), Analysis by Prizma

Impact category	Impact Topics	Preliminary analysis for the Project
Land use and territorial aspects	**Positive** • Infrastructure Negative • Expropriation/Displacement • Access to land	• No new/major traditional mining infrastructure for deep-sea PMN nodule collection site • Unknown infrastructure requirements for onshore/future processing • Existing strategy for oil industry assets (drilling ships etc.) • No presence or displacement of landowners at deep-sea PMN nodule collection site • Unknown displacement risk at onshore/future processing • Brownfield site expects to create insignificant risks • The context of Common Heritage of Humankind (see also Box **1**) will need to be considered
Demography	**Positive** • Population growth **Negative** • Gender imbalance, influx • Inflation	• Demography not affected by Project • Unknown demography impacts at onshore/future processing • No influx typical to terrestrial mining, capital construction projects • Project-induced inflationary pressures unlikely
Environment, health, and safety	**Positive** • None listed **Negative** • Water use competition • Health impacts • Environmental impacts affecting health	• Deep-sea PMN nodule collection has materially lower environmental resource/GHG intensity compared to LBM • Project can contribute critical metals, help transition to low carbon economy, the world's most material global environmental threat facing the world • No competition for water or land, and not near Indigenous People • Robotic mining results in lower health & safety risks (TMC/NORIS H&S statistics exemplary: 0 fatalities, 0 LTIFR from 2018-2021) • No industrial-scale use of hazardous chemicals or processing at deep-sea PMN nodule collection site (unknown at future processing facility) • Positive science and knowledge of deep-sea ecosystem • Concerns noted by conservation NGOs and others about ecological impacts

Impact category	Impact Topics	Preliminary analysis for the Project
Human rights	**Positive** • None listed **Negative** • Human rights abuses • Culture/aesthetic resources • Stakeholder inclusion • Discrimination • Indigenous rights	• Deep-sea PMN nodule collection in CCZ governed by multilateral ISA has materially lower risk profile compared to, for example, many emerging markets • ISA established a level playing field/regime to enable developing, land-locked countries, and others to benefit from natural resources in the CCZ/Area • ISA prioritizing gender balance and support for women • Pacific islanders' connection with oceans and environment (and many are ISA members) • ISA establishing approach for equitable distribution of excess revenues • IFC PS2 (including discrimination) are applicable • No presence of local communities or IPs at deep-sea PMN nodule collection site (unknown at future processing facility) • The context of Common Heritage of Humankind (see also Box **1**) will need to be considered.

Annex 7: Preliminary review of potential Ecosystem Services effects of the Project

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
• Provisioning ESS	• i agriculture, capture fisheries, seafood, game	• Potential negative effects to capture fisheries/seafood– requires further data/analysis being generated by Collector Test and operational EIA (sediment plume).	• More data required for deep-sea PMN nodule collection site and effects associated with, for example, sediment plumes. Unknown for undefined onshore facilities
	• ii water (drinking, industrial, irrigation) • iii forest areas	• Not applicable to DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ (ocean) • Unknown for undefined onshore facilities
• Regulating ESS	• i climate regulation	• On balance, expected indirect positive effects on climate regulation; also relevant to PS 3 effects on Climate Change • Potential localized impact to carbon sequestration: suggest minor impacts to carbon sequestration within manganese nodule fields coupled with potentially important impacts to primary production capacity107.	• Additional availability of battery metals for supply chain enabling transition to low-carbon economy. • Localized carbon sequestration affects, if any, not expected to link with affects on socio-economic receptors (compared to positive contribution to decarbonizing EV/transport sector). • Opportunity costs: land-based mining features higher resources and GHG intensity.

[107] Beth N. Orcutt, James A. Bradley,William J. Brazelton,Emily R. Estes,Jacqueline M. Goordial, First published: 13 January 2020, https://doi.org/10.1002/lno.11403, accessed 4/14/2022

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
	• ii waste decomposition, detoxification • iii purification of water • iv control of pests • v natural hazard mitigation	• Not applicable/significant for DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ (ocean) • Unknown for undefined onshore facilities
Cultural ESS	• i spiritual, sacred site	• Not present at Project site (see also PS7, PS8, page 49).	• Not applicable to deep-sea PMN nodule collection site in CCZ (approximately 700-1,700 km distance to UNESCO world heritage site or populated landmass, or further still to populated Pacific Island communities); although some possible effects/linkages postulated relating to, for example, cultural/spiritual connection with ocean and migratory species. Unknown for undefined onshore facilities.
	• ii tourism, recreation, hunting, fishing	• Not applicable/significant for DSM site in CCZ (ocean) • Unknown for undefined onshore facilities	• Not applicable to deep-sea PMN nodule collection site in CCZ • Unknown for undefined onshore facilities
	• iii scientific exploration, education	• Potential positive effects from furthering scientific knowledge of the deep oceans.	• Linkage to socio-economic receptors would include scientists/researcher, and knowledge gained for humankind.

ESS Type	Specific examples cited in PS Guidance Notes	Applicability - Possible Impact	Linkage to Socio-economic Receptors
Supporting ESS	• i nutrient capture, recycling	• Possible effects from physical change to mined ocean floor	• Though localized environmental effects expected, no discrete socio-economic linkages expected given depth, distances, relative size compared to size of abyssal planes, the presence of protected areas in CCZ (42%), and the size of the ocean.
	• ii primary production	• Potentially impacts to primary production capacity[108].	• Though localized environmental effects possible, no discrete socio-economic linkages expected given depth, distances, relative size compared to abyssal planes, the presence of protected areas in CCZ (42%) and size of the ocean.
	• ii pathways for genetic exchange	• N/A	• No discrete socio-economic linkages expected given depth, distances, relative size compared to abyssal planes, ISA-designated protected areas, and size of the ocean

[108] Beth N. Orcutt, James A. Bradley, William J. Brazelton, Emily R. Estes, Jacqueline M. Goordial, First published: 13 January 2020, https://doi.org/10.1002/lno.11403, accessed 4/14/2022

Annex 8: Applying IFC's sample indicators for incremental versus cumulative impacts to the Project

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
Additional wage employment opportunities	• Incremental numbers of employed and unemployed, participation rates of affected population • Incremental value of subsistence income, wage, and other income to population	• Number, size, skill levels of regional labor force • Measures for shifts in livelihood and sustainability of livelihoods	1, 2	• No multiple, co-located, large construction camps. Offshore workforce is relatively small (650 for 3 offshore nodule collection vessels, 200 for transport vessels). No major changes or triggering thresholds expected to be reached. Siting of onshore/processing facilities unknown, future analysis required.
Addition of a pollutant to the environment (air, water)	• Concentration of the pollutant in the emission and/or discharge • Concentration relative to discharge standard • Load from the project • Characterization of the spatial • emission and/or discharge plume from the project	• Concentration of the pollutant in the receiving environment • Concentration relative to ambient standard • Total loading (from all sources) of the pollutant • Characterization of the spatial pattern of the concentration of pollutants in the downstream environment	3	• Some aspects may have relevance to livelihood-related ecosystem services, if indicated by the EIS, monitoring results from Collection Test (Q4/2022), or lab testing (bioavailability). Depth of nodules and distance to nearest social receptors (>700-1,700 km) may indicate cumulative social impacts not discrete/unlikely, requires further analysis. Siting of onshore processing facilities unknown, future analysis required.
Additional incidents of disease, alcohol and drugs problems, and crime	• Number of additional incidents of sexually transmitted diseases, alcohol and drug problems; crime rates	• Total number of incidents, proportion of population affected	4	• No major constructing camps or local communities at offshore nodule collection site. Siting of onshore/processing facilities

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
	• Incremental changes to demands • on health, social, and policing services	• Measures for community and regional health and wellness; safety and security		unknown, future analysis required.
Loss of Land (land alienation)	• Area and/or proportion of land lost, damaged, or inaccessible because of the project • Incremental change in benefits of affected land users (e.g., lost agricultural production, subsistence • use)	• Total land area available, value of land use benefits • Total population affected • Measures for sustainable livelihood and poverty	5	• Offshore deep-sea PMN nodule collection does not feature local landowners or communities. However, connection of Pacific Islanders/Indigenous people to Ocean and its environs, and certain migratory species (intangible cultural heritage, ecosystem services). Siting of onshore processing facilities unknown, future analysis required.
Conversion or degradation of natural and critical habitat	• Area and/or proportion of natural and critical habitat converted and/or degraded because of the project • Incremental change in habitat quality and/or condition	• Total area of lost habitat • Change in rates of habitat loss • Measures of habitat fragmentation	6	• Some aspects may be relevant to livelihood-related ecosystem services. Needs analysis of Collector Test monitoring and plume-related data. Identification of valued social components for cumulative social impact analysis. Siting of onshore and processing facilities unknown, needs future analysis at a later date.
Regulation of downstream flows	• Percent reduction of downstream flows as compared to average annual flows	• River ecological integrity, including natural flow regimes (e.g., quantity,	1, 6	• Not readily transferable/applicable concepts considering open oceans, size of

Project Aspect	Incremental Impact Indicator	Cumulative Impact Indicator	IFC PS	Relevance to NORI-D Project (Social)
Reduction, modification, and/ or fragmentation of riparian and aquatic habitats	• Percent reduction of wetted perimeter or of usable habitat in the impacted river reaches • Connectivity from the river reaches upstream and downstream of the dam or weir	quality, seasonal variability, and predictability) • Viability of migratory fish populations		NORI-D, depths, and distances involved. Siting of onshore/processing facilities unknown, future analysis required at a later date.
Addition of mortality to a wildlife population	• Direct mortality caused by project operations over time • Percentage of local population (or range) lost with relation to global and/or regional population numbers (or range)	• Change in rates of regional and/or global population decline • Measures of population (or range) fragmentation	6	• Some aspects may have relevance to livelihood-related ecosystem services, incl. cultural significance of migratory species, if indicated by the Collector Test/EIA. Given size and location of CCZ, of which 42% protected, cumulative social/ESS impacts not expected to be discrete or reach significant livelihood threshold levels. Siting of onshore/processing facilities unknown, future analysis required.

Note: The table is based IFC's Good Practice Handbook: Cumulative Impact Assessment and Management. It provides examples of endpoints or indicators typically used on standard ESIAs vis-á-vis those that would be recommended or used in a CIA. The last column provides a preliminary analysis of the applicability or relevance to the NORI-D Project.