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The Pew Charitable Trusts is an independent non-profit, non-governmental organization dedicated to serving the public interest by improving public policy, informing the public, and invigorating civic life. In its capacity as Observer to the International Seabed Authority (ISA), we wish to submit the following comments on the scoping consultation undertaken by Nauru Oceans Resources Inc (NORI) on a social impact assessment (SIA). We welcome the opportunity to provide these comments, and hope the comments are integrated into the terms of reference for the upcoming SIA Study.

First, we take this opportunity to reiterate our position that deep sea mining cannot and should not take place unless a robust, environmentally friendly, appropriately precautionary, and effectively enforceable set of rules and regulations to govern the commercial exploitation of deep sea minerals are first adopted by the ISA. The current state of negotiations on the exploitation regulations, coupled with scientific uncertainty about the environmental impacts of deep seabed mining, precludes the development of such a regulatory regime. Therefore it is premature for commercial exploitation of deep sea minerals to be undertaken in the near future in the absence of such regulations.

Regarding the social impact assessment report, we have a number of serious concerns which are outlined in detail in the attached template submission.

Broadly speaking, we are concerned about the report's characterization of the balance of risks between environmental damage and benefits to society from deep sea mining. Specifically, we have concerns about a number of inconsistencies in the assumptions provided in the report. For instance, the characterization of the habitats of the Clarion Clipperton Zone (CCZ) as one with the "lowest biomass on Earth" is misleading, seeming to imply that harm to this region will be relatively inconsequential as compared to land-based mining. The CCZ

has extremely high biodiversity, with thousands of rare species, the majority of which have yet to be identified and of those that have been identified many have only been sampled once. This rarity puts this region at considerable risk of harm from any new pressures, such as deep seabed mining ¹. Similarly, the assertion that because polymetallic nodules sit “unattached on the seafloor” and therefore their exploitation will cause minimal damage to deep sea habitats is questionable. Removal of nodules will result in removal of habitats, which will not recover on human timescales. The scoping report generally fails to provide a complete picture of the impacts from deep sea mining, for instance, neglecting to account for the potential for transboundary harm, the spatial extent of impacts and disruption to ecosystem services, and loss of marine genetic resources.

We are also concerned about the veracity of the assertion that nodule processing will not generate any tailings or toxic byproducts as this claim is unsubstantiated by the scoping report (or indeed any other publicly available document from NORI or The Metals Company).

Lastly, we are concerned with the scoping document positing that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts traditional mining has on terrestrial environments. In this comparison between land based and deep sea mining, the document fails to state the extent to which seabed mining would actually substitute for terrestrial mineral supply. Rather, it seems likely that if seabed mining were to occur it would be in addition to current land-based mining. If this is indeed the case, the offset to terrestrial damage from seabed mineral extraction cannot be considered a benefit of the latter – which seems to be a primary premise for the reports many arguments in favor of deep sea mining as a better alternative to terrestrial mineral exploitation.

We thank you for initiating this process and conducting a consultation for a scoping exercise; and hope that similar exercises will be conducted for the Environmental Impact Assessment process.

Sincerely,

Julian Jackson

Senior Manager, Ocean Governance

The Pew Charitable Trusts

¹ [Frontiers | Editorial: Biodiversity, Connectivity and Ecosystem Function Across the Clarion-Clipperton Zone: A Regional Synthesis for an Area Targeted for Nodule Mining \(frontiersin.org\)](https://doi.org/10.3389/fmars.2019.00011); see also pending paper which estimates that 80-92% of benthic metazoan (animal) species remain to be described in the CCZ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4276976

NORI-D Polymetallic Nodule Collection Project

Stakeholder feedback form for NORI-D Social Impact Assessment Scoping

Instructions: Fill out and email as word or pdf attachment to stakeholders@nori.nr with subject “NORI-D SIA scoping consultation”. An online version of this may also be filled out and accessed [here](#).

Contact Information	
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First name	Julian
Name of Organization	Pew Charitable Trusts
Type of Stakeholder*	“Interest Group”- NGO
Country	USA
Email/contact details	jjackson2@pewtrusts.org
Request confidentiality (Y/N)	N
List up to 5 social/cultural/economic attributes or receptors you believe could be <u>negatively</u> affected by the Project	
<ul style="list-style-type: none">• Environmental impacts from deep sea mining will have significant social, cultural, and economic impacts as outlined in our comments below.• While this report and the comments outlined below are primarily about the impacts from the harvesting/mining of nodules in the deep sea, the shipment to and processing of nodules on land will have a different set of societal impacts. Details about how the nodules will be processed on land should be outlined in greater clarity in order to have a fuller understanding of the life cycle of the project.• The economics of seabed mining are still unclear, as outlined below. Some of this ambiguity stems from the lack of consensus on the payment regime that the ISA will impose upon contractors, but a lack of clarity on corporate income tax from sponsoring States, and the expected returns for the ISA and its Members suggests further analysis would be helpful• The ISA is entrusted by treaty to develop the rules and regulations to govern deep sea mining. If the Project goes ahead before ISA member States have been able to adopt the regulatory regime, it would severely damage the legitimacy of the ISA as an institution and regulator of the industry.	
List up to 5 social/cultural/economic attributes or receptors you believe could be <u>positively</u> affected by the Project	
The exploitation of mineral resources of the seabed are intended to be for the Common Heritage of (hu)Mankind, so should deliver benefits across the world and across generations. Whilst this is a laudable aim, it remains unclear the extent that this project will be able to deliver this.	
General Comments	
<u>Assessment of Environmental Impacts</u> The scoping document currently underplays the environmental impact that deep sea mining could have. Although this is not an EIS, environmental impacts have significant social implications. Damaging the deep sea would impact the cultural values or existence values held by people around the world. Sediment discharge in the mid-water column could have economic impacts to fisheries. It is thus important to represent the environmental impacts in an upfront and clear way. A few places where environmental impacts could be better addressed: <ul style="list-style-type: none">• Characterization of CCZ and its biodiversity	

- The scoping document refers to the CCZ as “common habitat” with the “lowest biomass on earth”, and notes twice the lack of plants in the CCZ. This ignores the high biodiversity and rare species that the CCZ is home to. An indicative list of what lives in the CCZ and what could be lost should be included. Please note our specific comments including those for page 7 below.
- “Unattached nodules” is misleading
 - The scoping document repeatedly uses the phrase “unattached nodules”, implying minimal disruption to the environment. In footnote 42, the document notes that the top five centimeters of seabed will also be collected and discharged. This process should be detailed in the main document, with reference to what is attached to the seabed and the nodules - i.e. the CCZ’s rich biodiversity.
- Tailings
 - The document notes that there will be no tailings as a result of NORI-D. It would be helpful to have “tailings” defined with a description of how they are different from the sediment that will be dug up and discharged back into the ocean. In particular, it should be made clear whether any additives or chemicals will be added to the sediment discharge (at the seabed or in the mid-water column). Reference should also be made to the effect that sediment plumes can have on sealife (i.e. smothering, etc) More detail is also needed for the mineral processing that occurs on land. It is our understanding that perhaps a third of an ore is made up of manganese, copper, nickel, and cobalt - what happens to the remainder of the ore?

In this investor presentation

https://www.sec.gov/Archives/edgar/data/1798562/000121390021013347/ea137001ex99-2_sustainable.htm) Deep Green reports that an ore is made up of:

- 31% Manganese, 1.1% Copper, 1.4% Nickel, and 0.1% Cobalt
- The rest of the nodule mass is 41% hydroxides, 18% Mg/Na/Al/Si, and 0.7% micronutrients
- How much of this mass is returned to the seabed, discharged into the mid-water column, brought back to land for processing, and left over (unable to be sold)?

Comparison to Land-based Mines

The scoping document posits that more metals will be needed to avert the climate crisis, and that seabed mining could be a source of metals that avoids the many impacts land mining has to terrestrial environments. However, in its many comparisons between land based and deep sea mining, the document does not make clear to what extent seabed mining would actually *offset* any land projects. It seems likely that instead of *offsetting*, seabed mining will occur *in addition to*. If seabed mining is occurring in addition to land-based mining, offsets to terrestrial damage cannot be considered a benefit.

The comparisons between land-based and deep sea mining is also quite uneven throughout the document and few of the negative consequences of seabed mining are listed. In “Table 2: Comparing key aspects of generic land-based mines with NORI-D” the categories are listed such that NORI-D does not have a single negative consequence - despite evidence for many negative environmental and possibly social consequences. The same applies for “Table 5: Preliminary comparison of “With Project”, “No project” and “Counterfactual” scenarios. More evidence should be given for the counterfactuals. Please note our specific comments below for the many categories of impacts.

Stakeholder Participation

It is encouraging to see that NORI defines its stakeholder base as “as any interested individual or organization” and that their “identified listing essentially comprises the entire human population around the world”. However there seems to be a disconnect later in the document where various stakeholders are

expected to be primarily represented through their Member States at the ISA (see specific comments for pages 53-54, and page 63 below). The purpose of the SIA should be to engage with and elicit stakeholder responses directly. This SIA could be precedent setting as it is for the first project in the Area, beyond national jurisdiction, affecting the Common Heritage of Mankind. As the project is in the Common Heritage of Mankind, greater effort should be given to educate and elicit public response - including from indigenous peoples, youth, industry representatives including from fisheries and other marine users, and those listed in Table 10.

Specific and Prioritized Comments

Section or Topic	Page	Comment
About this Document	2	<p>The project’s planned SIA is described as being structured around the sections outlined in the “ISA’s <i>Template Table of Contents for an EIS</i>”. To clarify, is the intent that the information gained from the SIA be incorporated into Sections 6 and 9 concerning ‘Description of the existing socioeconomic environment’ and ‘Assessment of impacts on the socioeconomic environment and proposed Mitigation’, respectively? If so, NORI may want to consider additional guidance for conducting an SIA, especially as this assessment could set precedent for conducting SIAs in ABNJ. NORI should draw on resources prepared for other/similar industries and note where differences exist given the DSM context. In addition, it is worth noting that during the most recent ISA meeting several delegations agreed (without any objections from other member States) with the addition of a standalone section (9bis) to describe and evaluate any uncertainties for assessments included in the EIS (environmental, socioeconomic and cultural). The scoping report does not seem to emphasize the need to highlight uncertainties (it is only mentioned one time in the report), so we recommend this be more greatly emphasized in the ToR.</p>
III - B - The NORI-D Project	7	<p>The Scoping Document characterizes the CCZ abyssal plains as “<i>common habitats, which feature some of the lowest biomass on earth</i>”. The CCZ is home to relatively low abundances, yet highly diverse communities. As Uhlenkott et al (2022) describe it, the CCZ is “a heterogeneous abyssal plain area....The relatively high heterogeneity of the CCZ seabed is thought to promote the development of highly diverse benthic communities” (see: https://www.nature.com/articles/s41598-022-12323-0; for more on CCZ biodiversity also see: https://www.frontiersin.org/articles/10.3389/fmars.2021.671062/full; https://www.frontiersin.org/articles/10.3389/fmars.2021.661685/full)</p> <p>See also the report of the workshop on deep CCZ biodiversity synthesis (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_-_final.pdf) which notes that “as for many abyssal regions, rare species dominate the diversity for nearly all faunal size classes/groups for all sites, substrates, and habitats thus far sampled” and estimates that 25 to 75% of species have yet to be discovered in areas that <u>have</u> been sampled. In fact, a pending publication suggests that 82 to 92% of benthic metazoan (animal) species in the CCZ remain undescribed and ~60% of described species have only been sampled once. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4276976).</p>

		The Scoping Document should take into account the high biodiversity of the CCZ and the need to protect rare species (many of which have yet to be discovered/characterized).
III - C: The Collector Test	9	This section describes that “Adaptive Management approach to the implementation of the commercial phase of nodule collections is considered best practice for a nascent industry with a relatively short history”. The article cited notes that adaptive management is interdependent with the precautionary approach and ecosystem approach, yet both of those approaches are not mentioned in the document. If this adaptive management approach is retained we recommend that the report relates how this approach is compatible with the precautionary approach and ecosystem approach (which are obligations as the draft exploitation regulations currently stand). International practice suggests that adaptive management is only compatible with precaution when there is sufficient baseline knowledge, clear and enforceable environmental objectives, processes for evaluating monitoring results to review and refine the hypotheses and the potential harm is reversible, and as such appears not to be appropriate at this time for deep-seabed mining.
III - C: The Collector Test	9	This section describes monitoring of plumes and noise, and the continuation of monitoring after the collector system test. The section should note whether the data will be made publicly available and how it will be submitted to the ISA for review.
III - C: Project One	11	Although the RKEF facilities will be in national jurisdictions and thus not necessarily in the purview of the ISA, NORI should consider expanding its description of its use of RKEF facilities to better understand their social impact. Are there socioeconomic, cultural and/or environmental impacts to consider? Are there waste stream implications to consider?
III D - Unique Attributes - Table 2	16	Table 2 is organized such that it seems as though NORI-D will have <i>no</i> impacts, with the caveat that “it is not implied that there may not be other types of impacts”. This table would be more useful for the purposes of assessing impacts if it compared a comprehensive list of impacts for <u>both</u> generic land-based mines and NORI. Footnote 15 concedes that while there are no plants in the deep sea, there are other biodiversity and ecosystem service concerns (including marine genetic resources). These concerns should be brought up to the main text. There will be biodiversity impacts and there is a high diversity of life in the CCZ, even if they are not plants. There may also be upper water column disturbances from sediment plumes that do impact marine flora (phytoplankton) This section should also include impacts to other industries, such as fisheries. It is also worth noting that the environmental impacts of this industry will likely be on a spatial scale well beyond any land-based mines, with the potential of impacting adjacent coastal States. The table also notes that there will be no impacts from roads, railroads, or port linkages. However ores from seabed mining will have to be imported/exported in some manner and any resulting tailings from processing will have to be stored as well.
III D - Unique Attributes	17	This section says the nodules “ <i>sit unattached on the seafloor</i> ” and do not require “ <i>removal of overburden</i> ”. However, footnote 42 (p26) notes that “ <i>5cm of seabed sediments are expected to be entrained and collected</i> ” and

		<p>that some portion of this will be discharged back to the ocean “<i>at a depth to be determined</i>”. The description of “unattached” nodules is misleading as the seafloor itself will be entirely removed down to 5cm, including any wildlife attached to the nodules or seafloor. Also, the NORI EIS for the collector test said the top 10-15cm of sediment would be disturbed. Is this no longer the case? It is worth noting that 90% of the sediment microbial community live in the top 10cm, and it could take decades before the microbial community recovers (https://www.science.org/doi/10.1126/sciadv.aaz5922).</p> <p>Further, discharging sediment back into the water column could have environmental impacts which should be more clearly noted. ((see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117))</p>
III D - Unique Attributes- Table 3	18	<p>Under “<i>Description</i>” the land option is described as an open-pit with a slurry pipeline whereas NORI-D only involves “<i>deep sea collection of PMN</i>”. There should be a more even description of the two options - the NORI-D project will remove the top 5-15cm of ocean floor and involve returning a slurry of sediment to the seafloor or water column (TBD).</p> <p>Under “<i>Tailing Management Facility</i>” it would be helpful in the SIA to include information to verify the claims made in this section. Our understanding is that the minerals of interest make up roughly 33% of the nodule. So, assuming 100% efficiency and sufficient demand for those minerals of interest (which seems to be questionable at the very least for manganese) there will be 67% of the nodule left over in the form of iron, magnesium, sodium, aluminum, silicon oxides and hydroxides. It is not clear to us from publicly available resources what will happen to these materials. If they are not sold then they would need to be stored in some sort of tailings facility. More information on this would be very much appreciated.</p> <p>Under “<i>Biodiversity</i>”, NORI-D is described as “<i>located in generally common habitat</i>” as noted in our line for page 7 - the CCZ is highly heterogenous with high biodiversity.</p>
III- E - Project Justification	21	<p>Money paid to ISA - Contractor should provide more explanation to justify their assumptions regarding the IRR and expected corporate tax rates. The current projections for cumulative royalties are, as indicated in the document, are not yet finalized.</p>
III- E - Project Justification	22	<p>This section notes that NORI is not currently subject to corporate income tax in Nauru, and that both parties are working to “resolve this issue”. This is interesting because it is difficult then to understand the economic benefits to the government from the Project. It must also be noted that the studies undertaken by MIT, which underpin the negotiations on the payment regime at the ISA, are premised on the assumption that contractors pay a 20% corporate tax rate. NORI must be transparent in the negotiations on the ISA payment regime discussions to divulge that it does not pay CIT in Nauru to help build a more accurate and informed model of the financial mechanism.</p>

		<p>Further, Table 4 on benefit sharing analyzes the largest and lowest five beneficiaries of deep sea mining royalty funds - and finds Nauru to be in the lowest beneficiaries category.</p> <p>Given that it does not stand to gain financially through corporate income tax from NORI, will not benefit from any future benefit sharing mechanism, and will likely undertake sponsoring state liability in the event of any environmental damage caused by its contractor, the economic benefits to Nauru from the NORI D Project do not seem compelling.</p>
<p>III - E - No Tailings Dams</p>	<p>26</p>	<p>NORI should define “tailings” and how they are different from the sediment that will be discharged in the planned project. As outlined in footnote 42, the seafloor will be dug up to a depth of 5cm. Most of the sediment will be left on the seafloor - however the sediment will no longer be in its original state. Any wildlife attached to the nodules or the seafloor will be killed. As the deep sea has slow growth and long life cycles, it is unlikely that the area will rebound back to its original state quickly. This is an environmental impact with social and cultural implications that should be noted.</p> <p>Additional sediment will be “<i>transported to the surface vessel to be separated and discharged back to the ocean at a depth to be determined</i>”. It is unclear whether any chemicals or additives (flocclants etc) will be used on or discharged with the sediment. Regardless, sediment discharged into the water column would have environmental impacts, it is important to consider these mid-water impacts to the wildlife living in the water column (see Drazen et al 2020: https://www.pnas.org/doi/10.1073/pnas.2011914117). Affecting mesopelagic food-webs could potentially have social implications if fisheries are affected. Although there will be no traditional tailings dam, there will certainly be leftover sediment to be disposed of with its attendant impacts. Also note our questions about tailings under our General Comments.</p> <p>Again, it is misleading to describe the nodules as “<i>unattached on the seafloor</i>” as the seafloor itself will be dug up along with any wildlife attached to it. Deep sea mining will also create a sediment plume that could affect an area much larger than the direct mining footprint. The sediment plume will also have environmental effects.</p> <p>Also, as noted in our comments on table 3, we are not convinced based on resources publicly available that there will be near zero tailings and therefore no need to store them. Over two-thirds of the nodules consist of non-target components, which will have to go somewhere. We recommend in the SIA report that more information is provided to verify this claim.</p>
<p>III - E - Social Impacts of Alternatives</p>	<p>26</p>	<p>The scoping document seems to claim that seabed mining would offset some amount of land based mining, thus avoiding land based social and environmental impacts. It is unclear to what extent seabed mining would <i>offset</i> these impacts rather than simply be in addition to them. This appears to be the underlying benefit of DSM expressed in this scoping report. If it is retained in the SIA report, we recommend providing</p>

		<p>evidence that suggests DSM will in fact offset land-based mining practices.</p> <p>Along these lines, it is worth noting that one could reasonably argue that opening up this new industry both disincentives addressing problems with land-based mining practices (so rather than offset actually perpetuates the problem) and puts less pressure on the need for innovative battery technology and recycling techniques to reduce the demand of these critical minerals. This counter argument should be included as a no-action alternative and should acknowledge a lot of the innovation in this space that is lowering metal demand predictions (e.g. within just the last 6 months the forecasted amount of total lithium-ion batteries that will be available for recycling in North America by 2025 went up 65%).</p> <p>The “<i>Deep Sea Mining Evidence Review</i>” commissioned by the UK (https://www.bgs.ac.uk/download/deep-sea-mining-evidence-review/) notes that “<i>From a societal perspective, it is challenging to compare the impacts of terrestrial and DSM</i>” and that “<i>For comparisons to be robust, they should be holistic, consider all aspects of cultural and societal impacts, all stages of the value chain, and consider long-term implications</i>”.</p>
<p>III - E - Biodiversity Opportunity Costs</p>	<p>27-28</p>	<p>Generally the same comment as above - This section notes that “<i>Continued and sole reliance on land-based...</i>” metals will increase biodiversity risks. The implication seems to be that deep sea mining will help avoid those biodiversity risks, however it is unclear whether seabed mining would actually offset any land-based mining or whether both would continue.</p> <p>This section says that it is necessary to reverse GHG trends and doing so would “<i>diminish extinction risks by more than 70 percent</i>”. This is a laudable goal, but again it is unclear how seabed mining would help achieve this goal if it is not actually offsetting any other production.</p> <p>This section claims that the NORI-D project will take up a small fraction of the CCZ and that much of the CCZ is protected by “no mining areas”. However this claim does not take into account the cumulative effects of multiple mining areas nor does it consider that the CCZ is under sampled, and much is still unknown about the seascape.</p>
<p>III - E - Marine Scientific Knowledge and Capacity Building</p>	<p>28</p>	<p>The scoping document notes that NORI will “<i>continue to contribute to the growing understanding of the deep-sea</i>”. Although data has been collected during the contractor’s exploration phase, it is hard to say how mining in the exploitation phase will contribute to our understanding of the deep sea. It is also arguable that scientists coming from a more academic angle would have studied the deep sea in a different manner, with different goals. The scope, motivations, mechanisms, and timescales of research done in an exploration context are likely to be quite different.</p> <p>Further, the scoping document notes that “<i>Results of these scientific studies are provided to the ISA</i>”. Are the results publicly available? How accessible are these results? We cannot not find any of NORI’s data on DeepData, nor any of the other subsidiaries of The Metals Company.</p>

		<p>NORI may want to verify its data is indeed publicly available through DeepData and if not, ensure through the ISA that it becomes publicly accessible.</p> <p>Currently the ISA is entering data into its DeepData database, however the database is still evolving and will hopefully undergo revisions in order to be more usable (see Rabone et al 2022: https://www.biorxiv.org/content/10.1101/2022.10.14.512288v1)</p>
IV - A - Conventional Mining	29	<p>In reference to conventional mining the document mentions:</p> <ul style="list-style-type: none"> - Mine camps: Labourers on mining ships will likely live on said ships for extended periods of time, actions should be taken to ensure their safe living conditions - Removal of forests and topsoil: It should be more clearly stated, in the main text and not a footnote, that in seabed mining at least the top 5 cm of the seabed is removed along with any attached wildlife - Processing of ore on land and transshipment of product: This will likely also occur with seabed mining. These will require a full carbon impact accounting as well. - Long term effects after closure: Long term effects will also exist for seabed mining - as noted by Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) effects from a simulated deep-sea mining experiment were noted 26 years later. Further, “<i>nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)</i>”.
IV - B - Deep-Sea Collection of PMN	29-30	<p>In comparison to its description on conventional mining, this section vastly underplays the effects of PMN mining. Again, it is misleading to describe the nodules as “<i>unattached</i>” when the seabed itself is collected. The section says there will be “<i>No rock cutting, digging...</i>” this is particularly confusing when the top five centimeters of the seabed are expected to be collected.</p> <p>This section notes that there will be “<i>no removal of plants</i>” - however fails to mention the immense biodiversity in the CCZ that will be impacted by deep sea mining. See earlier reference to potential impacts in upper water column (photic zones) to phytoplankton - which may in turn impact the ability to absorb CO₂</p>
IV- C - Onshore Facilities	30-31	<p>This section outlines potential processing options that are currently being explored in India. The SIA should give more detail on these options and their social and environmental impacts, as the options develop. In order to fully understand the social impacts of NORI-D it will be necessary to know which country nodules are being shipped to and what will happen to them once they are there. Perhaps the SIA could assess different options and examine those different alternatives.</p>
IV- D - Biodiversity Aspects	31-32	<p>Appreciate that NORI has partnered with many research and academic institutions to study the seafloor and water column. Establishing baseline knowledge is essential to understanding this relatively unexplored area and will be important to monitoring and adaptive management should mining proceed in the future.</p>

		<p>The document claims that the APEIs established as “no mining zones” will act “<i>as refugia and provide repositories of genetic diversity representative of the CCZ</i>”. The network of APEIs are indeed an important part of protecting the seabed and are integral to regional environmental management. However, claiming the APEIs as refugia may be premature. According to the the report for the Deep CCZ Biodiversity Synthesis Workshop held in 2019 (https://isa.org.jm/files/files/documents/deep_ccz_biodiversity_synthesis_workshop_report_-_final.pdf), “the current network of APEIs broadly represent the climate hazards across the entire region” and “APEIs 4 and 6 may be the climate-change refugia” (p. 37, note use of word “may”). Further, due to a lack of taxonomic data, “important variables in the development of REMP such as biogeographic comparisons of species ranges to determine if APEIs could act as refuges is impossible.” (p. 161)</p>
<p>IV - E - Closure</p>	<p>32</p>	<p>The scoping document says “<i>Prior research indicates...biomass...are expected to recover naturally over years to decades</i>”. The SIA should cite that research. Our understanding is that recovery will take multiple decades, possible millennia. See Simon-Lledo et al (2019, https://www.nature.com/articles/s41598-019-44492-w) which states effects from a simulated deep-sea mining experiment were noted 26 years later. Further, “<i>nodule removal will also alter the character of the seafloor habitat for the very long-term (i.e. thousands of years)</i>”.</p> <p>The scoping document also notes that a post-test long term monitoring plan for the IRZ will be submitted with the application for exploitation. More information on NORI’s closure and monitoring plans would be helpful to assess social and economic implications.</p>
<p>V - Feasible Alternatives</p>	<p>35-37</p>	<p>“<i>Table 5: Preliminary comparison of "With Project", "No Project", and "Counterfactual" scenarios</i>” vastly oversimplifies the impacts of having or not having a seabed mining project, in ways that obviously benefit NORI’s plans. We recommend this table be re-framed in a way that adequately acknowledges both the potential positives and negatives of seabed mining. Below we have provided some brief points for each of the categories to make the table more balanced, which have been expanded upon in our other comments:</p> <p><i>Socio-economic impacts -</i></p> <ul style="list-style-type: none"> ● No project’ - add no risk of disrupting ecosystem services (e.g. fisheries, climate regulation), no risk of losing marine genetic resources, no risk of transboundary harm to adjacent coastal States, more incentive for policy reform of existing and planned land-based practices and for innovation of both recycling and batteries technology to continue to reduce metal demand projections . ● Counterfactual - <ul style="list-style-type: none"> ○ for the first two bullets is there any documentation to support that these two activities will happen if DSM does not go forward? If not, they should be deleted. ○ The third point is illogical - DSM would be an additional market force and would only compensate DLBPS to offset serious impacts to their economies from DSM

		<p>Livelihoods -</p> <ul style="list-style-type: none"> ● Counterfactual - for the first two bullets is there any documentation to support that these two activities will happen if DSM does not go forward? If not, they should be deleted. <p>Climate Change</p> <ul style="list-style-type: none"> ● No Project <ul style="list-style-type: none"> ○ rephrase first bullet - “Growing deficit of battery metals, resulting in either increasing costs for critical metals or incentivizing policy reform and innovation of new technology thereby reducing demand predictions for critical minerals needed for the energy transition. ○ rephrase third bullet - “Continued reliance on high GHG intensity battery metals production or less reliance due to policy reform and innovative technologies driven by market and societal pressures. ● Counterfactual <ul style="list-style-type: none"> ○ rephrase first bullet -”Demand for battery metals met from other sources, with their own +/- impacts. Supply barriers continue for foreseeable future or new innovation of battery technologies and recycling techniques create reduce supply barriers ○ third bullet could be rephrased as above
V - D - Onshore Infrastructure	38	As noted in our General Comments and under our comment for “No Tailings Dams” for page 26 - NORI should define tailings, note what waste products will be dumped at sea, and what will happen to waste products on land.
VI - Regulatory Context	41	Appreciate the inclusion of the box on the “Common Heritage of Mankind”.
VI - C Pacific Small Island Developing States	43	In providing an overview of positions of the PSIDS, also include the countries within the region that have called for a moratorium on deep sea mining. These include Palau, Fiji, Federated States of Micronesia and Samoa.
VI - D - Land-based Producer States	44	<p>The scoping document quotes the advanced unedited version of the Lapteva et al study (2020). There is now an official 2022 version (https://www.isa.org.jm/node/21773).</p> <p>The scoping document seems to imply that because the majority of the listed Potentially Vulnerable Land-Based Producer states are ISA members and “involved in its governance”, no further analysis is needed. However, of the 13 identified developing countries whose economies may be seriously affected by nodule mining, a majority are not engaged or in attendance at the ISA Council or Assembly deliberations.</p> <p>The purpose of the SIA should be to help stakeholders, including these Member States, understand the impacts of NORI-D. This section should offer more detail on how land-based producer states will be affected.</p>

		<p>The scoping document notes that the Lapteva et al 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”.</p> <p>However, the study (2020 and 2022 versions) says “Offshore mining, under any scenario, will have a significant impact on the markets of affected metals, changing the direction and volume of supply of these metals”.</p> <p>As the study itself notes, modeling the effects of seabed mining to metal markets depends on many assumptions.</p> <p>For copper: “Under other consumption growth scenarios, a copper shortage may manifest itself either after 2032 or not at all, as all the world economy’s copper needs may be met by land-based production and secondary metal.”</p> <p>For nickel: “Only if nickel consumption growth rates are higher than the low scenario of consumption growth, the beginning of offshore mining will not cause overproduction of the metal”</p> <p>For cobalt: “However, significant overproduction of cobalt can be expected up to 2028 and is difficult to avoid. As a result, such large stocks of cobalt may accumulate in various warehouses that insufficient production would be compensated for by these stocks for a long time to come”</p> <p>The SIA should look at the nuances of this study and whatever other materials may be available, to determine effects to land-producer states.</p>
<p>VI - F - ISA’s Regional Environmental Management Plans</p>	<p>46</p>	<p>The LTC’s 2021 “Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone” (ISBA/26/C/43) includes many pending steps that will need to be accomplished prior to assessing an application for exploitation. The ISA will need to review the CCZ EMP again before accepting exploitation applications.</p>
<p>VI - I - The Republic of Nauru</p>	<p>49</p>	<p>Please note our comments above under “III- E - Project Justification” “page 22”.</p>
<p>VI - J - IFC Performance Standards</p>	<p>50</p>	<p>PS 5 - Understandable that land acquisition and involuntary resettlement will not play a role at sea, however this section also claims that “potential environmental effects of NORI-D in the CCZ will not likely generate significant adverse livelihood effects”. Can NORI-D provide more evidence for this claim - in particular for effects to fisheries?</p> <p>PS 7- Indigenous Peoples: This section notes that since “the NORI-D contract area does not feature the presence of Indigenous People or their territories” the SIA will not be considering this performance standard. However, since the NORI-D tract affects the common heritage of mankind, indigenous peoples should absolutely be consulted as stakeholders. We recommend including this performance standard in the SIA.</p>

		<p>PS 8 - Cultural Heritage: As noted in the scoping document “<i>Pacific Islanders are described as guardians or custodians of the oceans</i>” - part of the stakeholder outreach exercise should be to determine whether the deep sea is considered part of stakeholders’ cultural heritage or part of their custodial relationship.</p>
VII - Key Stakeholders	53-54	<p>Appreciate that NORI “<i>defines its stakeholders as any interested individual or organization</i>” and that the “<i>identified listing essentially comprises the entire human population around the world</i>”. Given that the NORI-D project will affect the common heritage of mankind, this is an appropriate definition.</p> <p>One category of actors that is missing from Table 10 is other industries - for example fishing and shipping. It is possible that seabed mining could affect these industries and so their input should be included. Other marine users should also be identified</p> <p>Another category missing from the list is youth - the next generation of business leaders and environmental activists should be actively consulted.</p> <p>We recommend that stakeholders be proactively involved and asked for input - it will not be enough to simply ask interested parties to check a website or be on a specific distribution list. As this project will affect the common heritage of mankind, and noting that the general public is still largely not aware of seabed mining, it could be useful to have a wider societal discussion on the industry.</p>
IX - A - Identification of Key Issues	62	<p>This section refers to the ISA’s draft regulations and topics that should be covered in the EIS. We recommend NORI survey the literature on SIAs to see if any further topics or steps should be included as best practice.</p>
IX - A - Identification of Key Issues	63	<p>This section suggests that indigenous people are not present in the NORI-D mining area and so are not relevant to this project. The section also says that PSIDs are members of the ISA and so if indigenous people did have an issue they could be represented through their Member State. However, in Section VI-J the scoping document says “<i>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</i>” (p. 51). Indigenous rights advocates and representatives are also specifically called out as stakeholders in Table 10.</p> <p>We recommend NORI actively seek out indigenous voices in its stakeholder outreach, and not simply rely on their representation through Member States at the ISA.</p>
IX - B - Workforce, Safety, & Security	64	<p>The scoping document notes that health and safety risks would need to be managed. However, it is unclear what health and safety risks on-vessel workers may be exposed to. Table 5 (page 36) notes that to-date there have been no fatalities or incidents, and that land-based mining would have relatively higher risks. However, should NORI-D reach full operations, the risks will be different from the current exploratory phase. A better comparison that the SIA could look into are the health and safety risks for high seas fishing vessels. How long will workers be on board ships? Where will they be hired? What access do they have to labour rights and representation? What machinery will they handle on board?</p>

		As the SIA develops it would be good to get more detail on how the “security and human rights context of the Project will be considered and evaluated” (see https://onlinelibrary.wiley.com/doi/10.1111/reel.12472).
IX - Bii - Fishing, Tourism & Scientific Research	64	This section notes that the sediment plumes generated at the sea floor and in the midwater column will be monitored during the collector test and that “such linkage to socio-economic receptors will be a focus of the SIA”. This will be key information in determining effects to the environment and to fisheries. More information on how this data will be collected and analysed would be appreciated. It is not clear what the linkage between plume generation and “socioeconomic receptors” is.
IX - C - Other Social Effects Linked to ESS	64	The SIA should also consider effects to: Provisioning ESS: Pharmaceuticals and biomaterials Cultural ESS: Existence values, option use values, stewardship values, aesthetic values - there are likely many cultural reasons to protect the deep sea beyond science and education (although those are important too) Under Regulating and Supporting ESS the document notes potential positive effects, however there are also potential negative effects given the disruption mining will cause to the environment (including negative impacts to charismatic mega fauna - noise) and other highly migratory species of concern). Levels of uncertainty should also be highlighted. The CCZ is still a relatively unexplored area with the degree and longevity of effects still unknown. Consider consulting Le & Sato 2017 (https://www.ocean-climate.org/wp-content/uploads/2017/03/ecosystem-services-deep-ocean_ScientificNotes_Oct2016_BD_ppp-9.pdf) and Thurber et al 2014 (https://bg.copernicus.org/articles/11/3941/2014/)
IX - D - Product Stewardship	65	Although processing facilities will be subject to host country regulatory and permitting requirements and not the ISA, some understanding of onshore effects would be useful for a full understanding of the project.
IX - E - Impacts on Nauru and the ISA	65	Please note our comments above under “III- E - Project Justification” “page 22”.
IX - F - Impacts on Developing Land-base Producers	65	Please note our comments above under “VI - D - Land-based Producer States” “page 44”.
IX - G - Cumulative Social Effects	66-68	Current ISA guidance is interpreted to suggest that “no cumulative impact assessment (CIA) may be required until an exploitation application has been submitted”. It would be good to have some sense of expected cumulative effects before an exploitation application has been submitted. Table 12 lists categories to consider for cumulative assessment. This table does not appear to be exhaustive. Recommend additional components be added such as ecosystem services, marine genetic resources, biodiversity.

X- Methodology for Impact & Risk Assessments	72	This section lists step (iii) “stakeholder identification (focusing on those directly affected) - as noted in the Stakeholder section NORI “defines its stakeholders as any interested individual or organization” and that the “identified listing essentially comprises the entire human population around the world”.
X- Methodology for Impact & Risk Assessments	72	This section notes that 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”. The SOI should consider the length that impacts last - as the deep sea is marked by slow life cycles, impacts could last millenia (see Simon-Lledo et al, 2019, https://www.nature.com/articles/s41598-019-44492-w)).
Annex 5 - Changes induced by terrestrial mining that can lead to social impacts and risks	81-85	There should be an equivalent table of changes induced by seabed mining that could lead to social impacts and risks, which should address many of the concerns/impacts we have raised throughout this submission.
Annex 7 - Preliminary review of potential Ecosystem Services effects of the Project	89-91	Note specific comment for page 64
Annex 8 - Applying IFC’s sample indicators for incremental versus cumulative impacts to the Project	94	Several categories note that “Siting of onshore/processing facilities unknown, future analysis required at a later date”. It will be hard to assess the social/economic impacts if analyses are not carried out until after the SIA. “Addition of mortality to a wildlife population” implies that because 42% of the CCZ is protected under APEIs, the project will not reach significant livelihood threshold levels. More evidence needs to be given on this account, especially taking into account the CCZ’s high biodiversity levels.

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