the metals company

Collector Test Study
Environmental Impact Statement

REVISIONS

Testing of polymetallic nodule collector system components in the NORI-D contract area, Clarion-Clipperton Zone, Pacific Ocean

NORI
NAURU OCEAN RESOURCES INC.

Submitted to:
International Seabed Authority
The Secretary-General
14 - 20 Port Royal Street
Kingston, Jamaica
West Indies

4 March 2022

Forward looking statements.

Forward Looking Statements

Certain statements made in this press release are not historical facts but are forward-looking statements for purposes of the safe harbor provisions under The Private Securities Litigation Reform Act of 1995. Forward-looking statements generally are accompanied by words such as "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "expect," "should," "would," "plan," "predict," "potential," "seem," "seek," "future," "outlook" and similar expressions that predict or indicate future events or trends or that are not statements of historical matters. The forward-looking statements contained in this press release include, without limitation, statements that waste streams could be reduced by using deep-sea nodules. These forward-looking statements involve significant risks and uncertainties that could cause the actual results to differ materially from those discussed in the forward-looking statements. Most of these factors are outside TMC's control and are difficult to predict. Factors that may cause such differences include, but are not limited to: regulatory uncertainties and the impact of government regulation and political instability on TMC's resource activities; changes to any of the laws, rules, regulations or policies to which TMC is subject; the impact of extensive and costly environmental requirements on TMC's operations; environmental liabilities; the impact of polymetallic nodule collection on biodiversity in the CCZ and recovery rates of impacted ecosystems; TMC's ability to develop minerals in sufficient grade or quantities to justify commercial operations; the lack of development of seafloor polymetallic nodule deposit; uncertainty in the estimates for mineral resource calculations from certain contract areas and for the grade and quality of polymetallic nodule deposits; risks associated with natural hazards; uncertainty with respect to the specialized treatment and processing of polymetallic nodules that TMC may recover; risks associated with collective, development and processing operations; fluctuations in transportation costs; testing and manufacturing of equipment; risks associated with TMC's limited operating history; the impact of the COVID-19 pandemic; risks associated with TMC's intellectual property; and other risks and uncertainties, including those in the "Risk Factors" sections, included in the final prospectus and definitive proxy statement, dated and filed with the Securities and Exchange Commission (the "SEC") on August 12, 2021 relating to the business combination, in TMC's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, filed by TMC with the SEC on November 15, 2021, and in TMC's other future filings with the SEC. TMC cautions that the foregoing list of factors is not exclusive. TMC cautions readers not to place undue reliance upon any forward-looking statements, which speak only as of the date made. TMC does not undertake or accept any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements to reflect any change in its expectations or any change in events, conditions, or circumstances on which any such statement is based except as required by law.

Objectives.

Collector Test

- Demonstrate the technical feasibility of the polymetallic nodule collection system.
- Assess the technical performance of the prototype collection system and incorporate learnings into the design of the full-scale commercial system.
- Assist in predicting potential environmental impacts associated with full-scale operations.

Webinar

- Review stakeholder consultation process and next steps
- Share a summary of the stakeholder comments received
- Describe the process to review and consider the stakeholder comments
- Summarize the changes made to the EIS in response to stakeholder comments

A technical review of the EIS and changes will not be undertaken

Timeline.

July 2021

- **29 July:** Submission of NORI EIS to the International Seabed Authority

Aug 2021

- **3 August:** Secretary General provided feedback on the completeness of NORI's EIS

Oct 2021

- **5 October:** Nauru hosted an introductory stakeholder workshop
- **6 October:** Nauru posted the EIS, recording of introductory stakeholder workshop, and webinar powerpoint presentation on Nauru's portal

Nov 2021

- **19 November:** Public stakeholder comment period closes

March 2022

- **1 March:** NORI submitted a revised EIS to the ISA
- **3 March:** Nauru posted the revised EIS, public comments, NORI's response to public comments, and webinar agenda on Nauru's portal
- **7 March:** Nauru hosts stakeholder workshop inform stakeholders of the changes that have been made to the EIS

July 2022

- **LTC response anticipated**

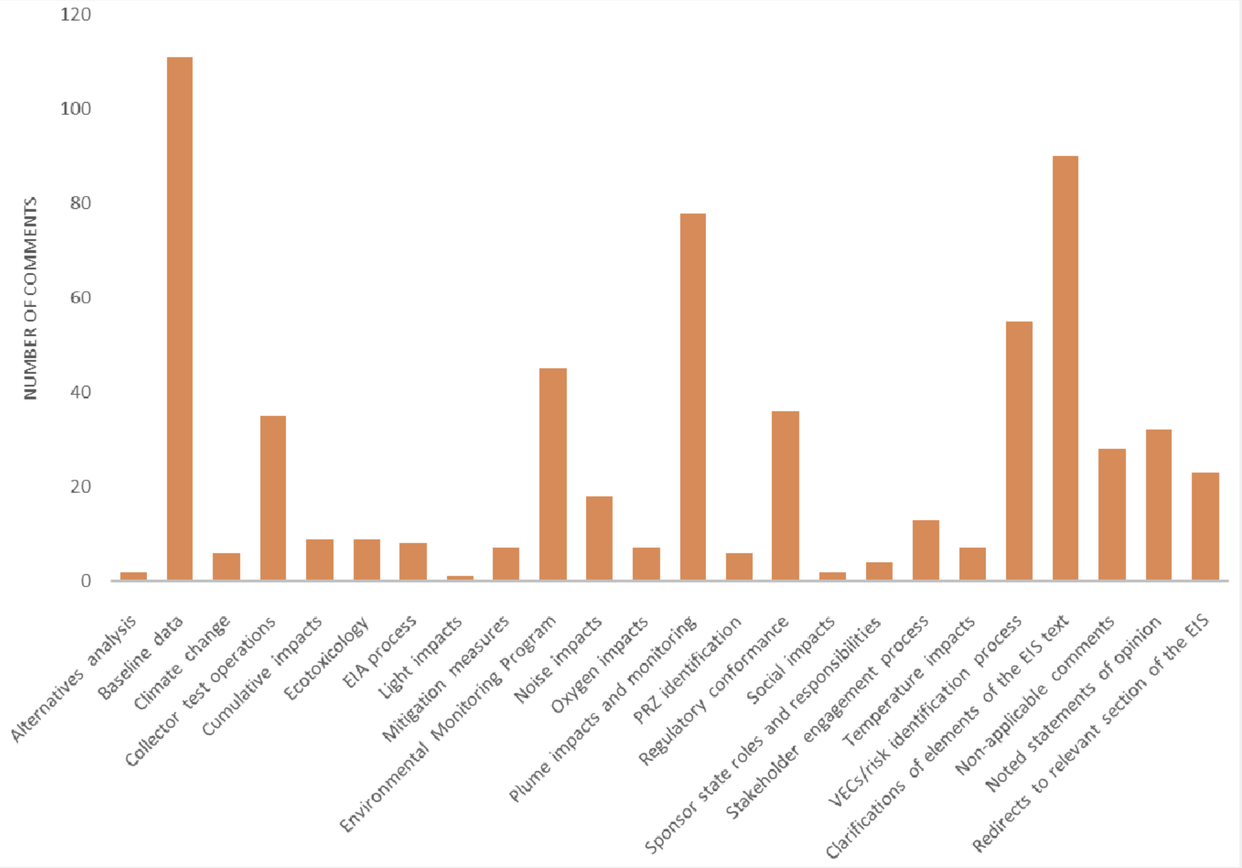
Submissions.

1. Deep Sea Mining Campaign (DSMC)
2. Mining Watch Canada (MWC)
3. Government of the United Kingdom (UKGov)
4. The Pew Charitable Trusts (PEW)
5. United States Government (USGov)
6. Submissions from individuals via website portal
7. Federal Republic of Germany (FRG)
8. Deep-Ocean Stewardship Initiative (DOSI)
9. Deep Sea Conservation Coalition (DSCC)
10. 10 submissions from individuals via the Nauru EIS portal

Themes.

Across all submissions a total of 632 comments were received relating to the following 21 common themes:

1. Alternatives analysis
2. Baseline data
3. Climate change
4. Collector test operations
5. Cumulative and transboundary impacts
6. Ecotoxicology
7. EIA process
8. Light impacts
9. Mitigation measures
10. Environmental monitoring program
11. Noise impacts
12. Oxygen impacts
13. Plume impacts and monitoring
14. PRZ identification
15. Regulatory conformance
16. Social impacts
17. Sponsor state roles and responsibilities
18. Stakeholder engagement process
19. Temperature impacts
20. VECs/risk identification process
21. Clarifications of elements of the EIS text



Valid.

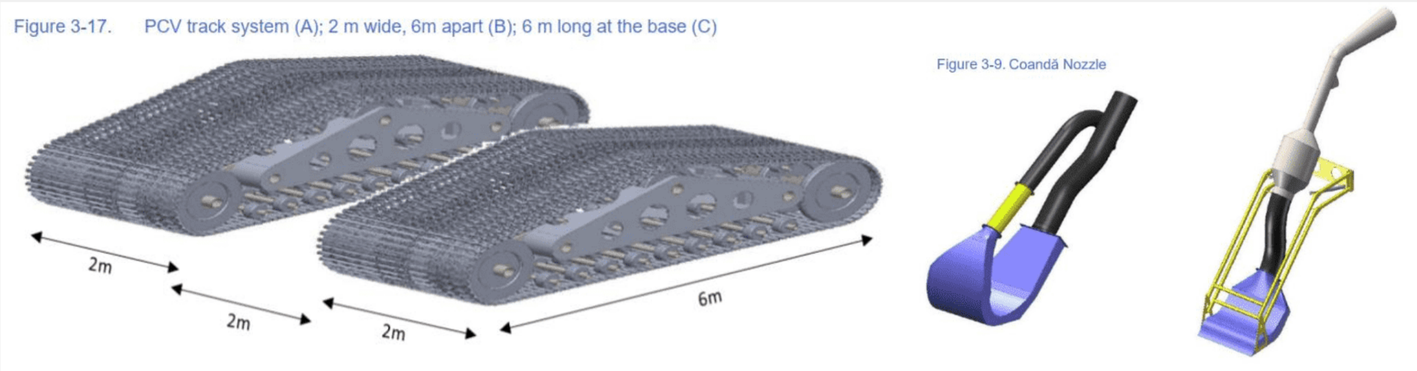
Examples of comments that NORI cannot respond to in the context of the Collector Test EIS

- *“In light of the already-substantial research around deep sea disturbances due to mechanical strain, the proposed NORI-D collector test to be conducted within the Clarion- Clipperton Zone (CCZ), under the management of The Metals Company (TMC), should not be allowed to go any further.”*
- *“Please act quickly to halt this test, and any subsequent proposals for such activities which will cause irreparable harm to the seabed and its living communities.”*
- *“We already know from DISCOL that the environment will not recover. This is reason enough not to undertake deep sea mining.”*

Relevant.

Examples of comments that are not relevant in the context of the Collector Test EIS as they have previously been addressed or are outside of the scope for the Collector Test EIS.

- *Para (38c) Requirement: Running gear (skis, wheels, caterpillars, Archimedes screws, bearing plates, water cushion, etc.) which contacts the seabed, and the width, length and pattern of the collector tracks on the sea floor;* ***NORI: no detailed information.***
- *Para (38a) Requirement: Mineral collection technique (passive or active mechanical dredge, hydraulic suction, water jets, etc.);* ***NORI: not sufficient.***
- *What will the processing of the mined materials look like beyond what happens on the ship? The processing may use sulphuric and hydrochloric acid.*



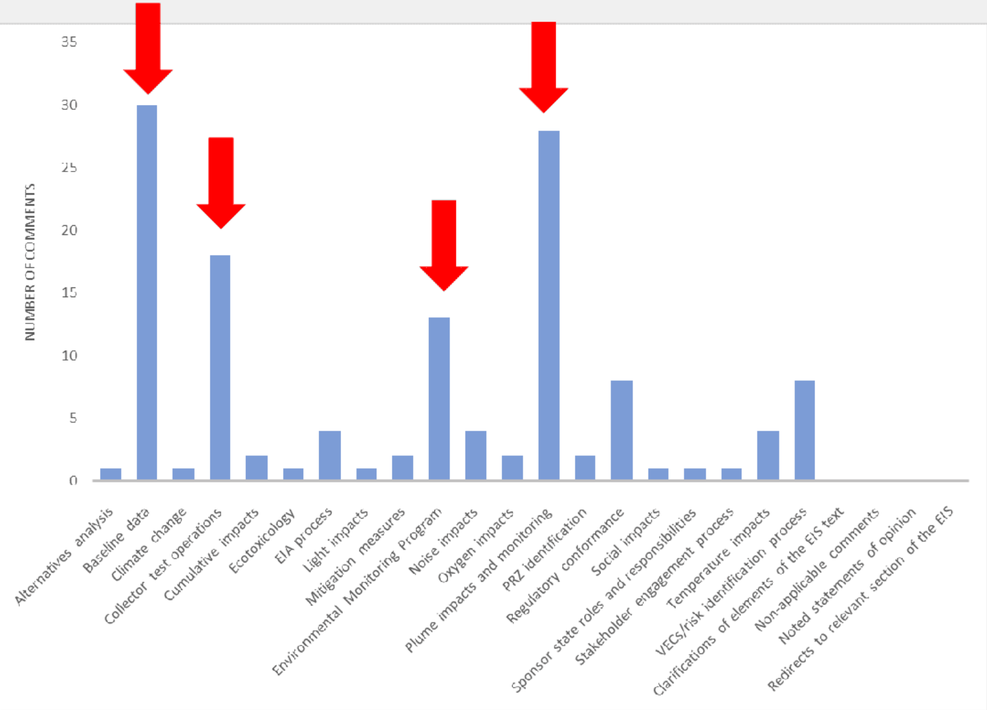
Novel.

Examples of multiple iterations of the same comment or question…..

- *“The conclusion indicates that there are no significant impacts, despite there being a complete absence of baseline biological data. It might be a reasonable assumption for a small test, but it is contrary to all the ISA guidance and it is inappropriate to draw that conclusion with no supporting biological data.”*
- *“The lack of benthic data available at the time of writing means there is no robust baseline on which to base assessments”*
- *“We recommend to complement the EIS with detailed and currently missing environmental calibrated and interpreted baseline data from both the test site and a proven ecologically similar control site.*

Criteria: Valid. Relevant. Novel.

Of the **632 comments** received a large proportion were duplicates, statements of opinion, or not relevant in the context of the Collector Test EIS. As such comments that were deemed to be valid, relevant and novel (VRN) could be responded to; totalling **132 comments**.



- Baseline data
- Collector Test Operations
- Environmental Monitoring Program
- Plume impacts and monitoring

Key revisions to the EIS.

1. Expansion of Chapter 5 Physicochemical baseline **60 → 84 pp**
2. Expansion of Chapter 6 – Biological (benthic and pelagic) Baseline **26 → 162 pp**
3. Re-run of sedimentation models to include greater granularity of sedimentation footprint
4. Addition of an alternatives analysis of key decisions relating to the format of the collector test
5. GHG budget has been calculated and a commitment added to offset emissions
6. Description of the surface processing of the nodule slurry has been added to the project description
7. Rational for VEC identification is expanded to including references describing likely impacts from DSM
8. Noise assessment has been included as a precursor to the development of a noise model for operations
9. Expanded discussion on the cumulative and transboundary impacts anticipated in the context of the Collector Test
10. Designation of up to two additional benthic control sites

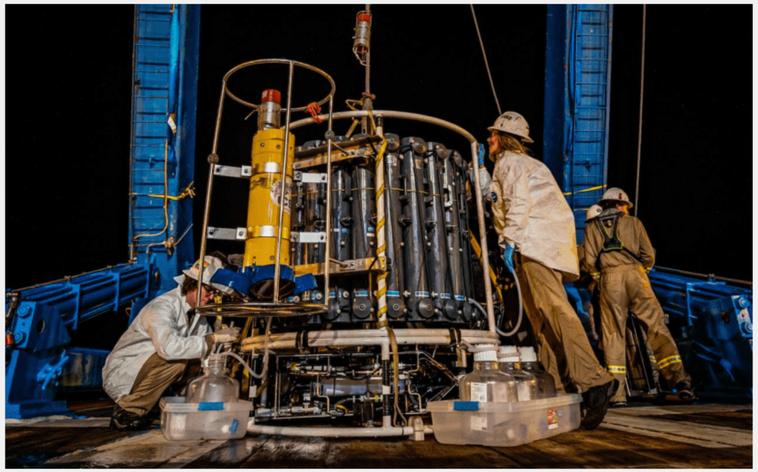
Record-setting nine offshore environmental campaigns totaling 283 days at sea.

#	Campaign ID	Start Date	End Date	Focus
1	Campaign 4A	2/10/19	23/10/19	Deployment of three oceanographic moorings. Water sampling and hydrographic profiling.
2	Ocean Infinity	23/05/20	30/05/20	25K seabed images collected used for megafauna identification and quantification.
3	Campaign 4D	16/6/20	15/7/20	Serviced the oceanographic moorings. Water sampling and hydrographic profiling.
4	Campaign 5A	16/10/20	30/11/20	Collected data on the benthic biology, sediment geochemistry and surface biology.
5	Campaign 5B	5/3/21	14/4/21	Pelagic biology studies of NORI-D supported by ROV, CTDs, MOCNESS
6	Campaign 5D	27/4/21	12/6/21	Collected seasonal data on the benthic biology, sediment geochemistry and surface biology
7	Campaign 4E	6/7/21	29/7/21	Serviced the oceanographic moorings. Water sampling and hydrographic profiling.
8	Campaign 5C	21/9/21	2/11/21	Seasonal pelagic biology studies of NORI-D supported by CTDs, MOCNESS.
9	Campaign 5E	12/11/21	22/12/21	ROV pelagic and benthic transects and sample collection.
10	Pre/Mid- Collector Test	Q3/2022	TBA	Pre- and during Collector Test studies. Benthic, pelagic and plume.
11	Campaign 4F	Q3/2022	TBA	Service oceanographic moorings
12	Post - Collector Test	Q3/2022	TBA	Disturbance studies during and after the Collector Test will be conducted.
13	Campaign 4G	Q3/2023	TBA	Serviced the oceanographic moorings

Record-setting nine offshore environmental campaigns totaling 283 days at sea.

Campaign 4A, 4D, 4E (71 days at sea)
Deployment and servicing of the oceanographic moorings deployed at NORI-D. And oceanographic profiling.

Campaign 5A & 5D (90 days at sea)
Collected seasonal data on benthic biology, sediment geochemistry and surface biology of NORI-D using box-core, multicore and floating hydrophones



Campaign 5B & 5C (82 days at sea)
Seasonal pelagic biology studies of NORI-D supported by ROV, CTDs, MOCNESS nets and rosette water quality samplers for trace metals

Campaign 5E (40 days at sea)
ROV pelagic and benthic transects and sample collection. Collection of seasonal seabed images used for megafauna identification and quantification

Expansion of Chapter 5 Physicochemical baseline 60 → 84 pp.

Figure 5-43. A - Dissolved Oxygen profiles measured on Campaigns 4A, 4D; B - Dissolved Oxygen profiles measured on Campaign 5B.

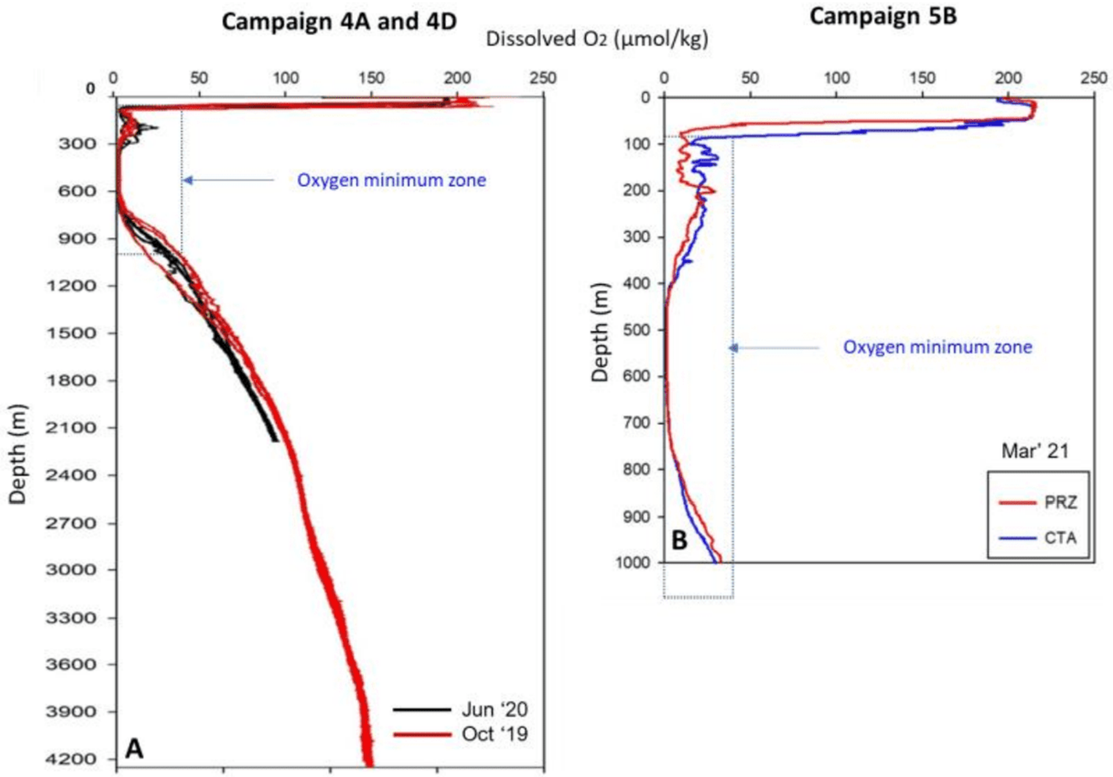
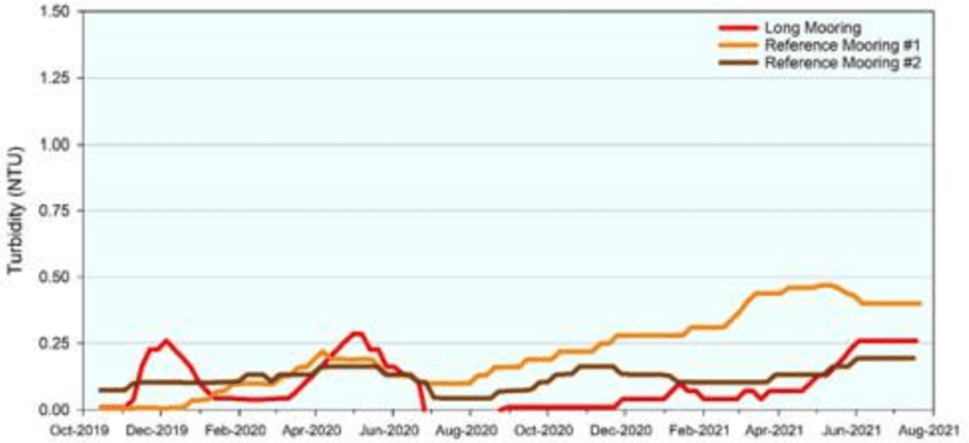


Figure 5-20. Running median of near-seafloor (i.e., <3.5 m above seafloor) turbidity values (NTU at the Long (red) and Reference (orange and brown) mooring stations from October 2019 through Jul 2021.



Expansion of Chapter 6
Biological baseline
26 → 162 pp.

Megafauna.

Figure 6-3 Variations in (A) megafaunal and (B) xenophyophore test density across different study areas surveyed at NORI-D.

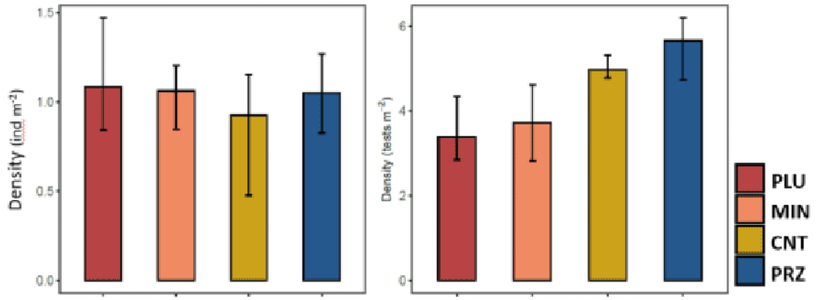
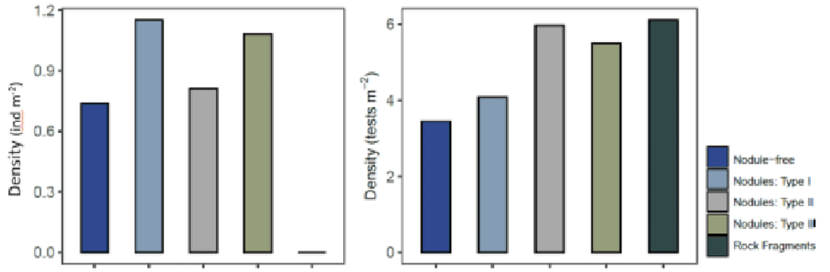


Figure 6-4 Variations in (A) megafaunal and (B) xenophyophore test density across different seabed types surveyed at NORI-D. Note that sample sizes surveyed in each of these seabed types were not equivalent. (see Section 5.17 for a description of sea bed types).



Expansion of Chapter 6 Biological baseline 26 → 162 pp.

Macrofauna.

Figure 6-17 Community composition of the macrofauna across NORI-D

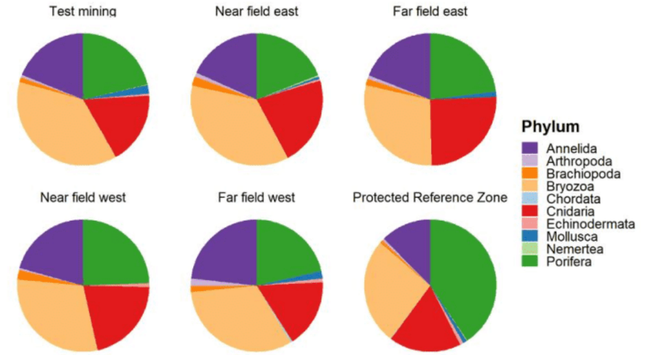
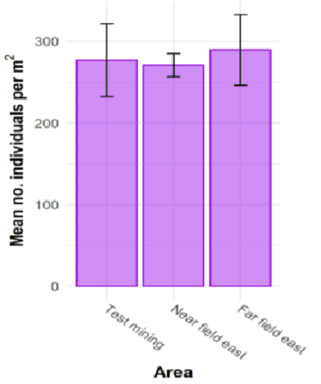


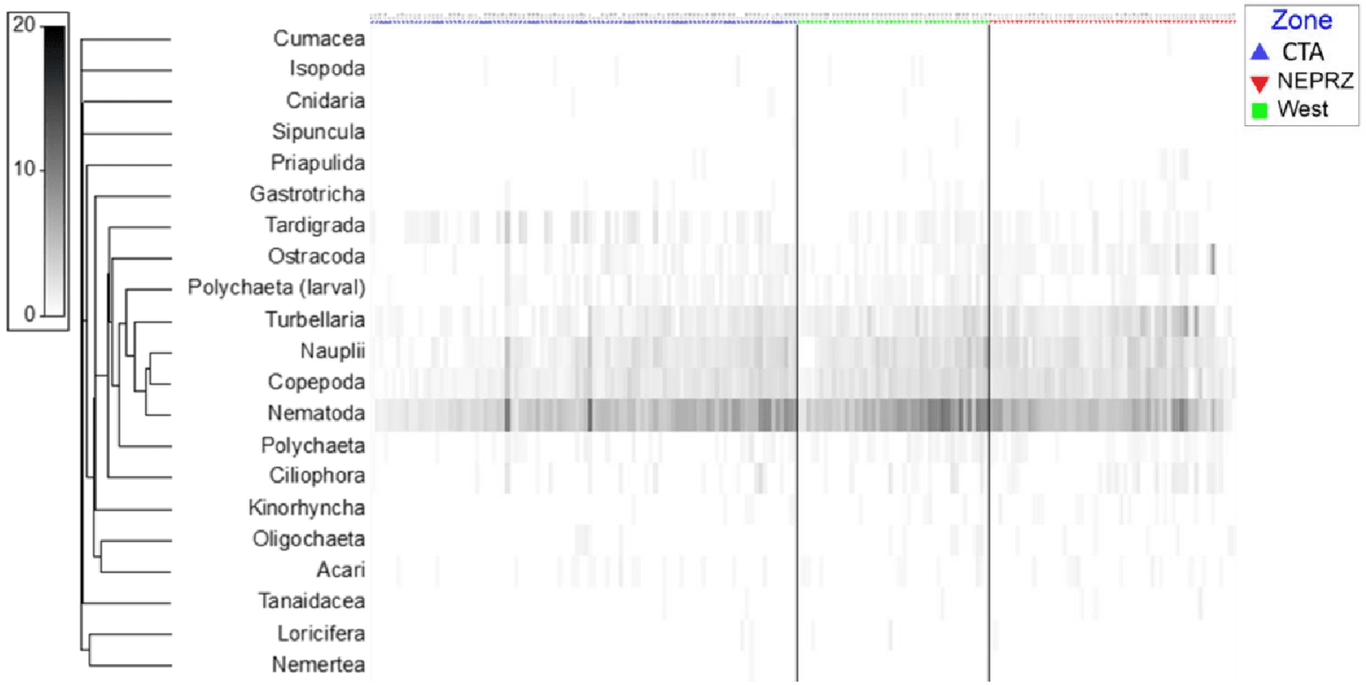
Figure 6-18 Bar plot indicating the mean number of mud-dwelling specimens found per m^2 in each of the three areas sampled in the NORI-D Campaign 5D.



Expansion of Chapter 6
Biological baseline
26 → 162 pp.

Meiofauna.

Figure 6-27 Matrix shade plot of meiofauna higher taxa with associated taxon cluster profile based on similarities in presence and abundance of higher taxa across all samples. A darker shade implies greater density in the sample. Samples (left to right) are ranked according to zone in the NORI-D area. CTA: Collector Test Area; West: Western area CTA; NEPRZ: NE Preservation Zone.



Expansion of Chapter 6 Biological baseline 26 → 162 pp.

Meiofauna.

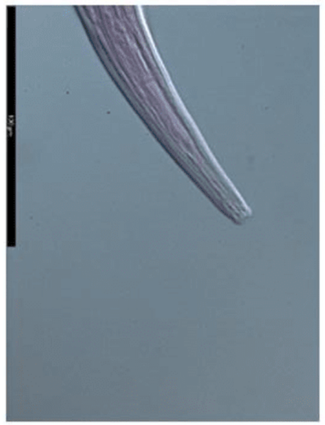


Figure 6-31 Left: Nematode genera accumulation curves for total number of samples processed so far in NORI-D, and for the three different zones (CTA, Western area surrounding the CTA, and the NEPRZ). Right: Chao1 genera richness estimator rarefaction curves for total number of samples processed so far in the NORI-D region, and for the three different zones (TMZ, Western area surrounding the TMZ, and the NEPRZ).

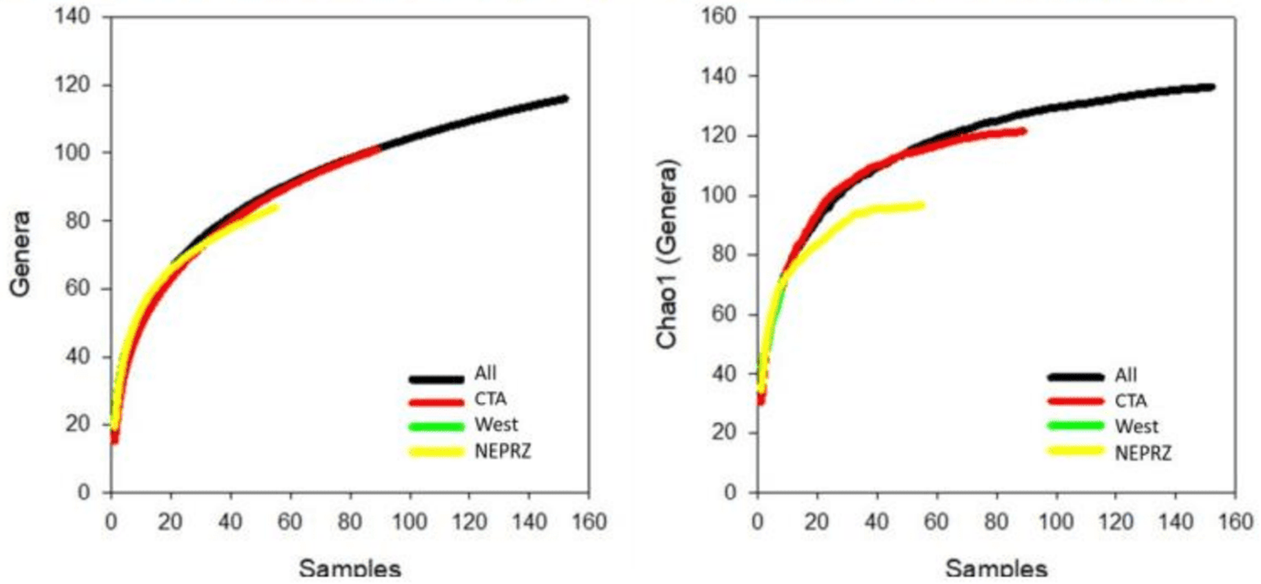
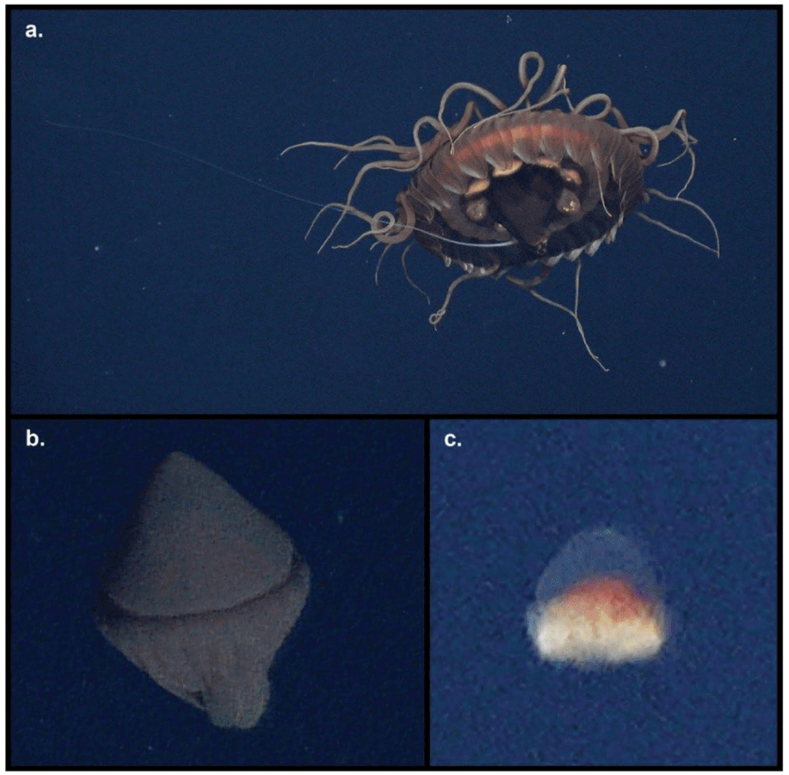


Figure 6-30. Light microscope images of head regions of nematode specimens recovered from the NORI-D area.

Expansion of Chapter 6 Biological baseline 26 → 162 pp.

Gelatinous zooplankton.



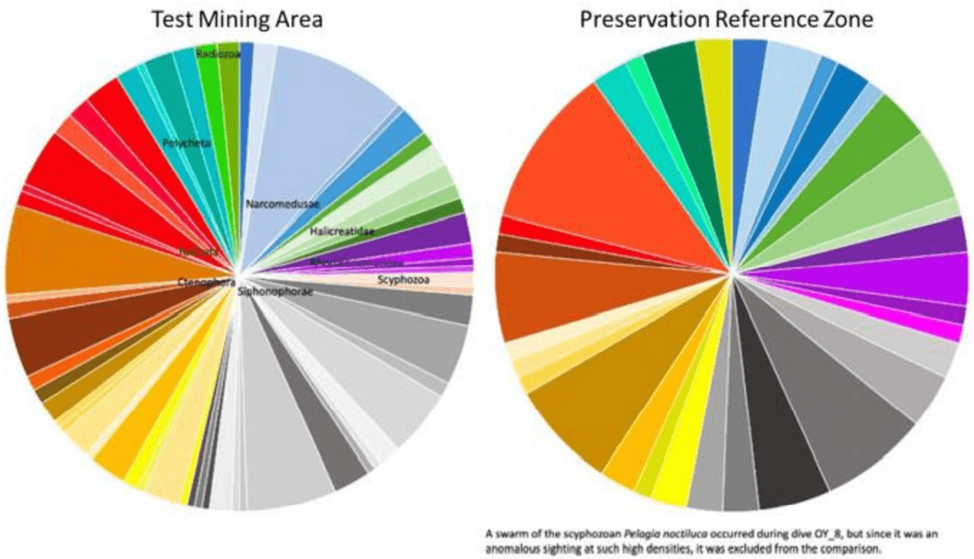
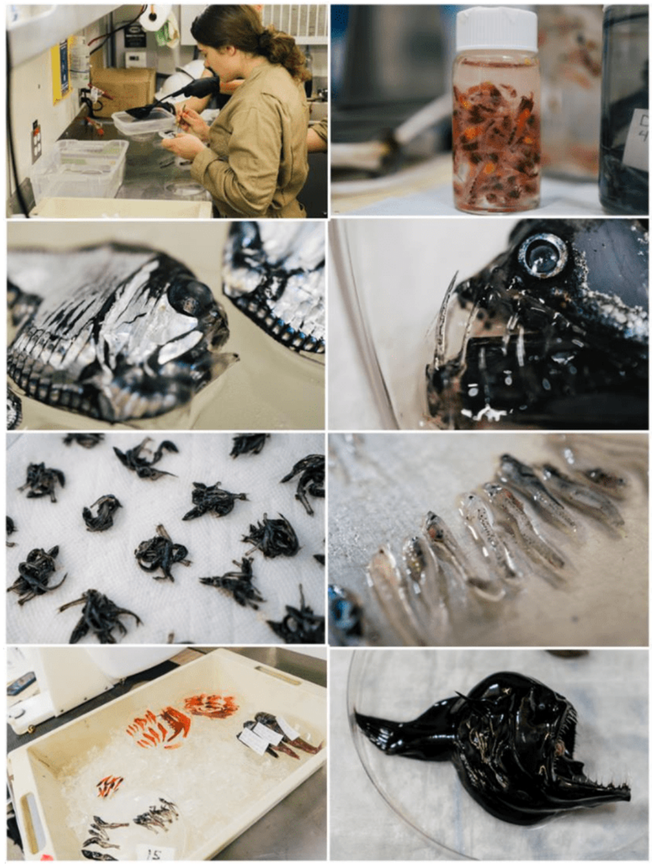


Figure 6-72. Comparison of mid-water gelatinous zooplankton diversity between (A) Collector Test Area (CTA) and (B) Preservation Reserve Zone (PRZ)

A swarm of the scyphozoan *Pelagia noctiluca* occurred during dive OY_8, but since it was an anomalous sighting at such high densities, it was excluded from the comparison.

Expansion of Chapter 6 Biological baseline 26 → 162 pp.

Micronekton.



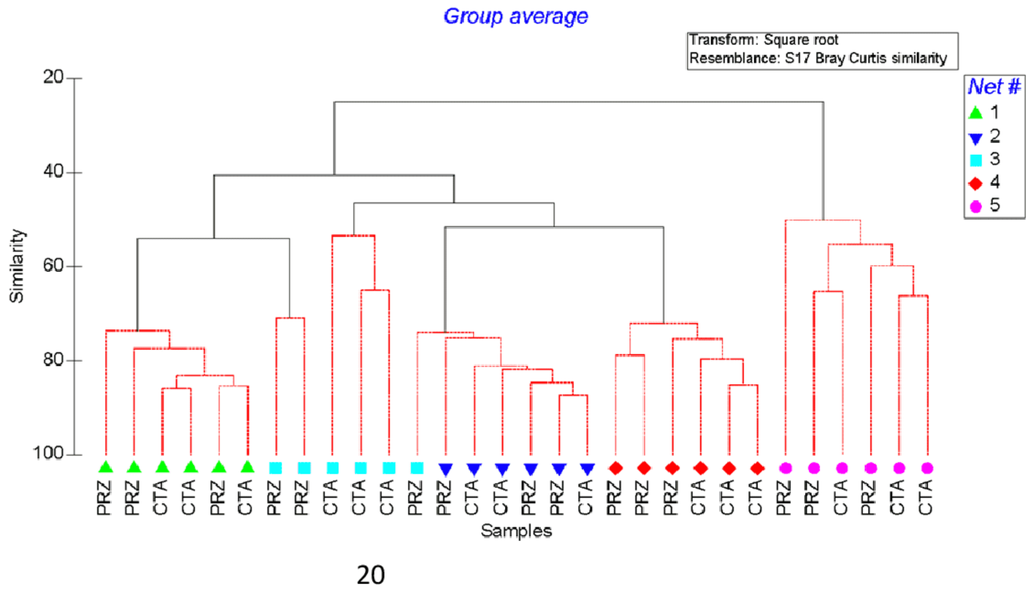


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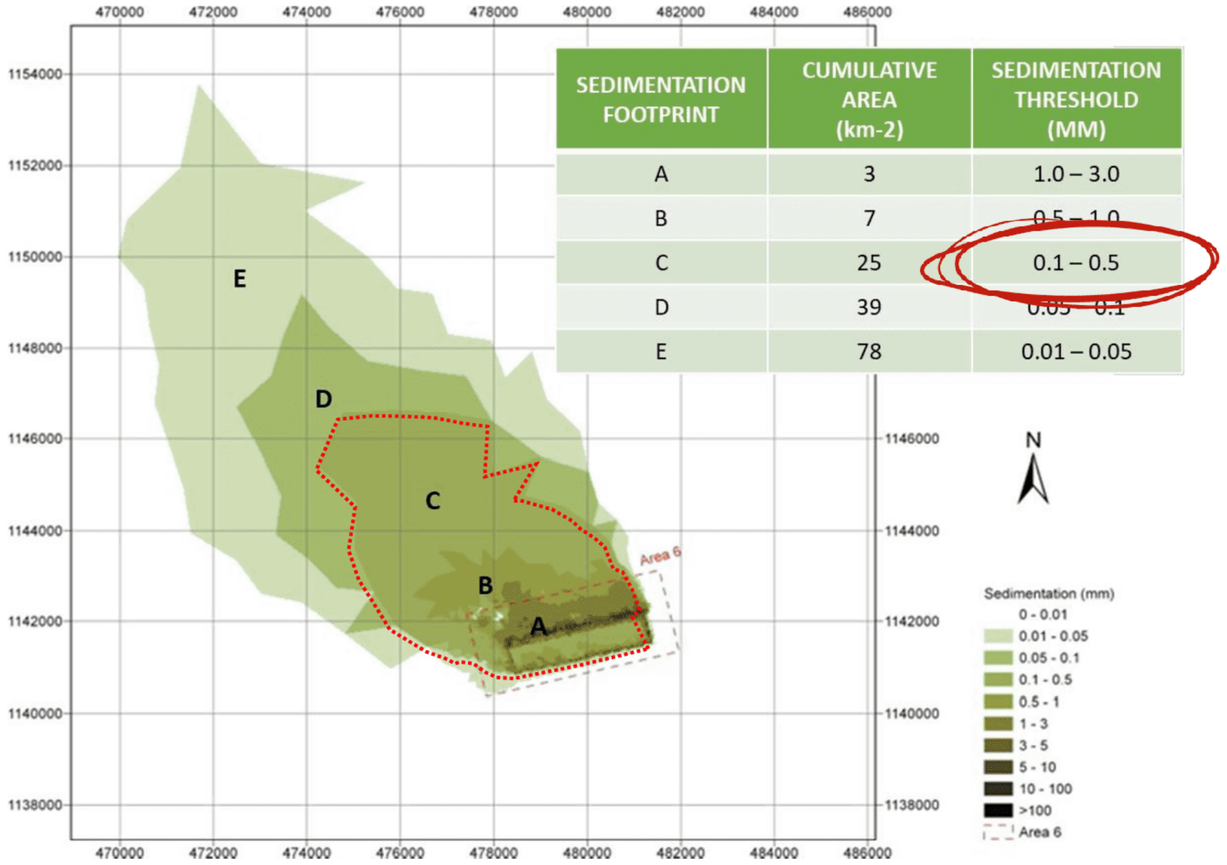
Figure 6-83 Cluster analysis of the micronekton community (families or broad taxa) by net and by day (top panel) and night (bottom panel) to control for differences deriving from vertical migration. For net depths see Figure 5. Groups connected by red lines are significant clusters (SIMPROF, $p<0.05$).

Re-run of sedimentation models to include greater granularity of sedimentation footprint.



SEDIMENTATION FOOTPRINT	CUMULATIVE AREA (km-2)	SEDIMENTATION THRESHOLD (MM)
A	3	1.0 – 3.0
B	7	0.5 – 1.0
C	25	0.1 – 0.5
D	39	0.05 – 0.1
E	78	0.01 – 0.05

Addition of an alternatives analysis of key decisions relating to the format of the collector test.

Alternatives	Decisions	Outcomes & Rationale
'Collector Test' or 'No Project'	**Option 1** Collector Test VS **Option 2** No Project	ISBA/25/LTC/6/Rev.1. Annex 1.66. Describes tests of mining components as «*an opportunity to determine the environmental implications of mining*». If the project does not proceed: • There will not be an optimal understanding of the environmental impacts of the mining components; • The Commercial EIS will be deficient of information required to make an informed decision. **The 'No Project' option was dismissed as this does not provide an optimal understanding of the environmental impacts of the mining components**
Conduct the test be conducted in the 'CCZ' or 'elsewhere'	**Option 3** Shallow water/ Lab based trials only VS **Option 4** Deep water trials in CCZ	Component testing in deep waters (>4000m) is considered essential to fully test the equipment under the operational conditions. The findings from the test will inform the design and operation of the full commercial system informing specifications that optimise resource recovery and environmental performance. **The 'Shallow water / Lab based trials only' as this does not provide understanding of the environmental impacts of the mining components**
Situate the CTA in the 'Flatter Area' or 'Other' geoform	**Option 5** CTA in 'Flatter Area' geoform VS **Option 6** CTA in other geoform	A benthic geoform analysis and mapping exercise was conducted (see Section 5.14). The findings of this analysis were "*:By limiting the disturbance caused by the collector test to the most abundant 'Flatter Area' geoform the potential for significant impact to abyssal hills and seamounts, which have been shown to be higher in species richness and biomass, is reduced.*" **The 'CTA in other geoform' option was dismissed as this does not minimise the potential for environmental impacts.**
Situate TF in 'Area 6' or 'Other Area'	**Option 7** TF in other area of CTA VS **Option 8** TF in Area 6 of CTA	Nine potential areas within the CTA were considered for the TF. Area 6 was selected based on it's location, size, orientation, slope and site conditions; the combination of which was considered optimal for safe PCV operation with minimised potential impacts to the environment (see Section 3.3.2) **The 'TF in other area of CTA' option was dismissed as this does not optimise the potential for safe PCV operation with minimised impacts to the environment.**
Situate BACI control site in 'PRZ' or 'Assign new control area'	**Option 9** PRZ VS **Option 10** Assign new control area	A PRZ representative of the pre-mining condition of multiple geofoms has been established in the NE corner of NORI-D. In addition a BACI specific control site has been established which is closer to the IRZ and potentially representative of the conditions at the IRZ. **The 'BACI Control Site in PRZ' option was dismissed as the new control site is likely a better representation of the conditions in the IRZ.**

GHG budget has been calculated and a commitment added to offset emissions.

SUMMARY

	Air Travel CO_2e (tonnes)	Vessel CO_2e (tonnes)	Collector Equipment CO_2e (tonnes)	Total equipment shipping emissions CO2e (tonnes)	Total collector test emissions CO2e (tonnes)
Estimated Total GHG Emissions Collector Test	334.84	17,159.67	2,969.60	1.81	20,465.93

BREAKDOWN

1. Flights

Assuming 100 people flight to San Francisco coming from Europe

Rough Average flight distance from Europe to San Francisco (km) - 10,000

Number of people on board	Air passenger distance travelled to get to/from ship (km)	Air Travel CO_2e (tonnes)	Air Travel CO_2 (tonnes)	Air Travel CH_4 (tonnes)	Air Travel N_2O (tonnes)
100	2,000,000	334.84	332	0.01	10.60

EF source: GHG protocol https://ghgprotocol.org/calculation-tools

Transport	CO2 Factor (kg / passenger mile)	CH4 Factor (kg / passenger mile)	N2O Factor (kg / passenger mile)	AR5 (kgCO2e)
Air Travel - Long Haul (>= 2300 miles)	0.166	0.0006	0.0053	0.1674213

2. Vessels

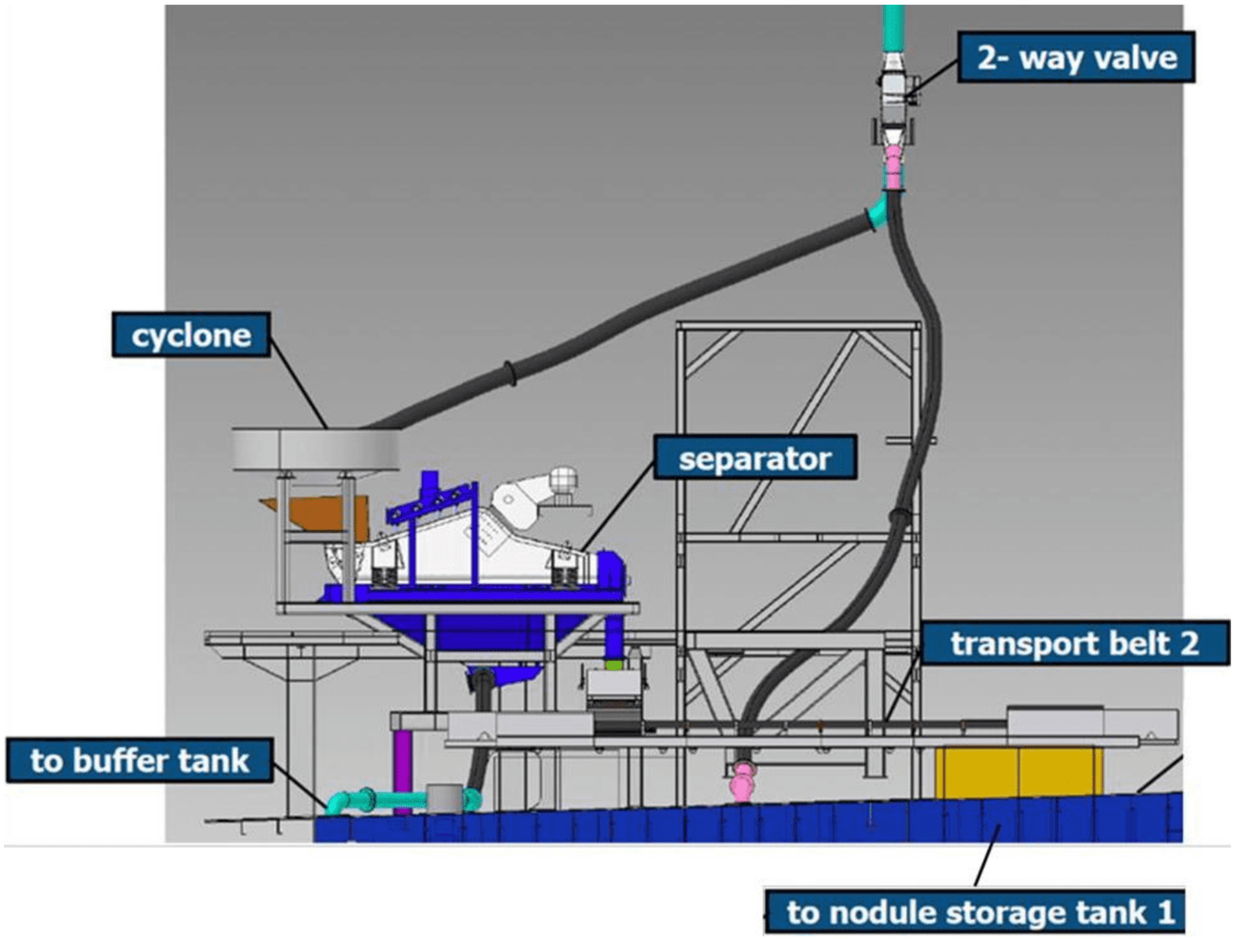
There will be 3 vessels during the collector test. The Hidden Gem, a support vessel and a science vessel.

Fuel usage is the source of GHG emissions and vessels usage occurs in two ways: transportation to/from the CCZ and while in the CCZ.

Routes to get to CCZ:

Hidden Gem (40,000 hp)	Rotterdam to Teneriffe test area	Test area to Tenerife's port	Tenerife to Punta arenas	Punta arenas to Manzanillo	Manzanillo to CCZ	CCZ to San Diego	Return to Rotterdam	Roundtrip total
nautical miles	1,500	246	5,674	4,778	900	1,350	13,548	27,996

Description of the surface processing of the nodule slurry has been added to the project description.



Noise assessment has been included as a precursor to the development of a noise model for operations.

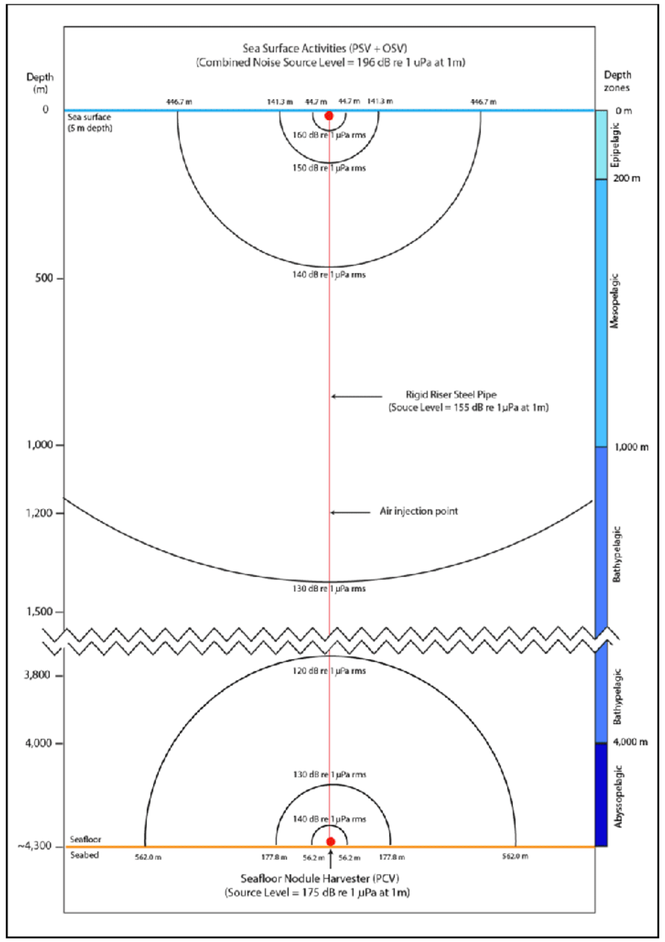


Figure 8-2. Conceptual acoustic zones of influence

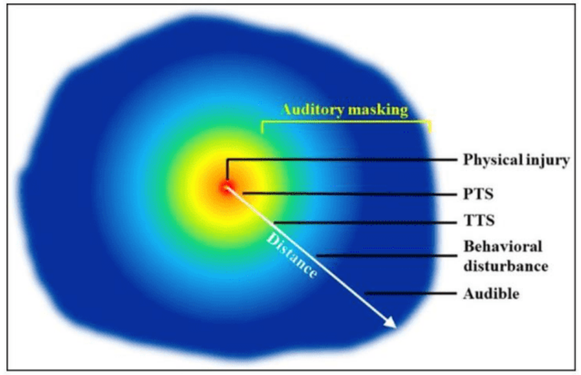
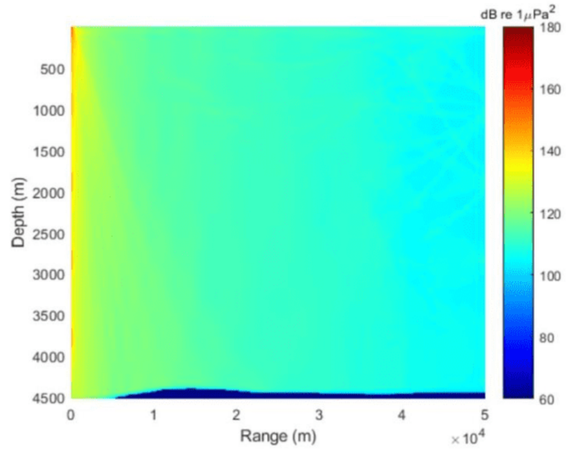
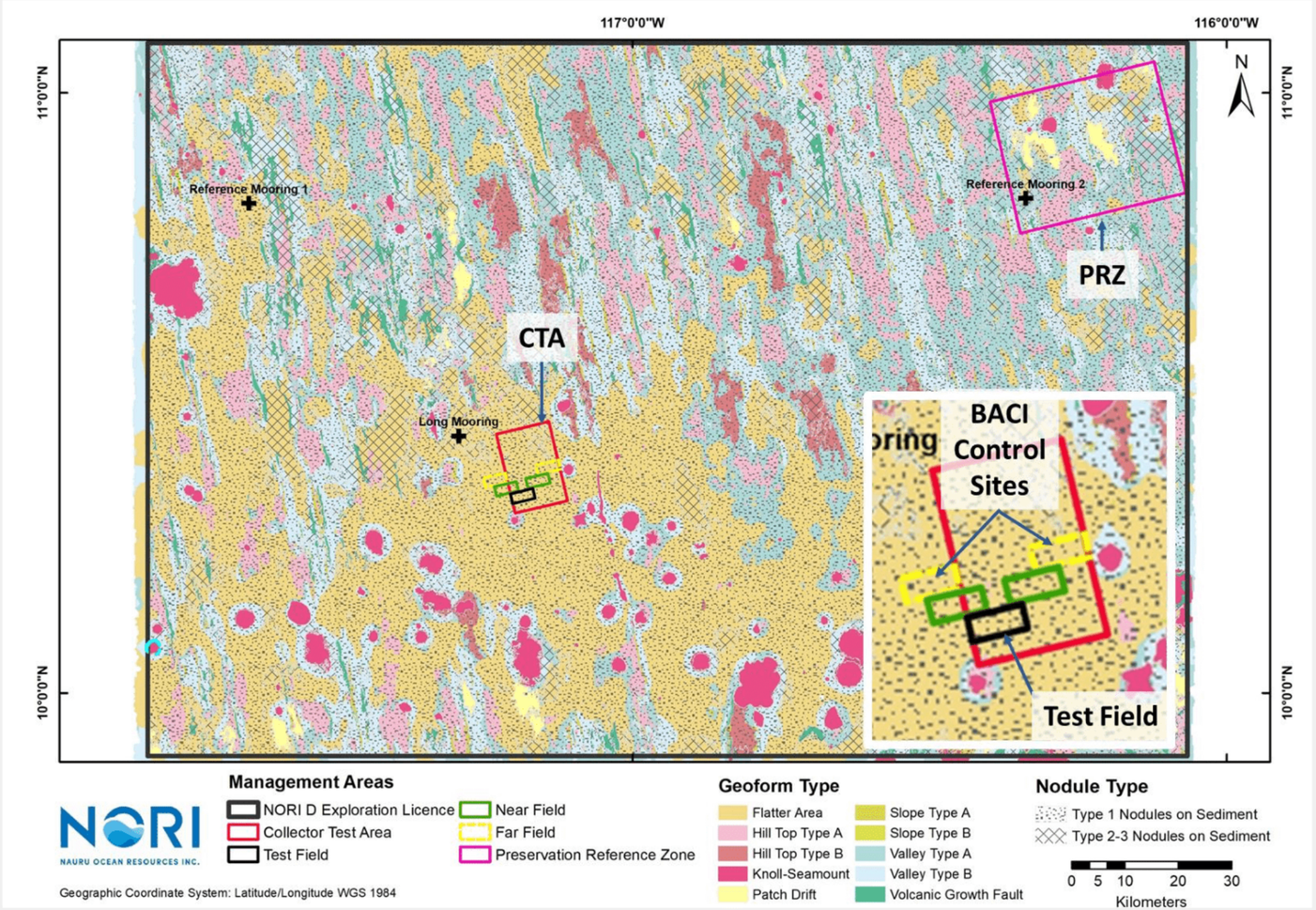


Figure 8-3. Sound pressure map for the Blue Nodule Project (van der Schaar *et al.* 2020)



Environmental Monitoring Program. Designation of two additional control sites.

The monitoring of the collector test will be the first data collection effort for the long term Environmental Monitoring Program on the NORI-D site and details will be incorporated in to the EMMP that will be submitted to the ISA 2 months prior to the start of the Collector Test



Next steps.

Stakeholder Engagement

- NORI appreciates the comprehensive stakeholder consultation process developed and implemented by Nauru
- NORI appreciates the time and effort stakeholders took to review and comment on the EIS and was pleased with the level of engagement.
- NORI believes that the revised EIS is now a more robust document than the original version, demonstrating the value of the stakeholder engagement process.
- Stakeholder engagement process for the the collector test EIS is now complete
- Stakeholder consultation and engagement will continue for the NORI-D project. Future updates and information: https://metals.co/nori/

NORI EIS Review

- Stakeholder comments were considered and the EIS was revised
- The ISA has received the revised EIS and the Legal and Technical Commission will now review the document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Time: 18:20:36 UTC
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Easting : 482149.97m
Northing: 1147003.90m
HDG: 56.92
Depth: 4294.20m
Alt: 1.17m
Thank you.
NORI
NAURU OCEAN RESOURCES INC.