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Implementing Environmental Impact Assessment for Deep Sea Mining: Lessons to Be Drawn from International and Domestic EIA Processes

Introduction

Environmental impact assessment (EIA) is a central element of the pre-approval environmental management process for deep seabed mining (DSM) activities in the Area.[1] EIA has been identified as a legal requirement under the United Nations Convention on the Law of the Sea (LOSC)[2] and as a constituent element of a State's, and, by extension, an international organization's, obligation of due diligence to protect and preserve the natural environment.[3] The International Seabed Authority (ISA) has incorporated EIA processes into its existing exploration regulations and into its proposed exploitation regulations.[4]

Although EIA is an accepted and widely adopted regulatory tool in both international and domestic contexts, there remain significant challenges to the implementation of EIA requirements.[5] There are several dimensions to these challenges, which include concerns over the comprehensiveness and relevance of the assessment, the quality (predictive accuracy) of the studies undertaken, the extent and nature of public participation, and the degree to which the assessments influence decision-making.[6] The implementation of EIA is further complicated by the high degree of variability of the decision-making environments to which EIA attaches. As a consequence, the forms of EIA processes and institutional structures also vary considerably across different systems.[7] Consequently, a central goal of developing new EIA requirements and processes ought to focus on developing practices that are well suited to the normative and institutional environment in which they are to be implemented — referred to as "fitness" in this report.[8]

This report describes key features of EIA across a selection of international and domestic EIA processes in order to identify institutional structures and process features that may best inform the development and implementation of EIA requirements for DSM projects. To that end, this report first provides an overview of the unique context for implementing EIA in relation to DSM, with attention to the normative, institutional and epistemic environment in which decisions respecting the approval of DSM activities are made. This report then provides a comparative analysis of existing EIA processes across a selected range of international and domestic EIA processes, with the intent of identifying the range of approaches adopted within these different settings, and provides an assessment of the fitness of identified arrangements with the requirements of the DSM regime, including the proposed draft Exploitation Regulations.

Central to the analysis in this report is a recognition of the multiple roles that EIA plays in decision-making processes. At its simplest, EIA is a decision support tool that ensures that decisions with the potential for adverse effects on the environment are undertaken with a comprehensive understanding of the environmental consequences of the proposed activity. In international settings, EIAs are closely tied with the due diligence obligation of States to avoid causing significant environmental impacts through actions under their jurisdiction.[9] A further role for EIA is that it structures open and participatory processes concerning the project and its potential impacts in order to generate legitimacy for project decisions among stakeholders. To some degree, the legitimacy of project decisions will be tied to the ability of an EIA to prevent

environmental harm. However, in decision-making environments where determining what constitutes significant harm is uncertain and contested, the degree to which EIA processes can satisfy procedural goals becomes an important aspect of justification of the decision.[10] In this regard, EIA ought to be understood to implement not only a State's due diligence obligation to prevent harm but also commitments in international law to ensure public consultation and to facilitate cooperation between States respecting shared resources.[11] As described in this report, the decision-making environment for DSM implicates the interests of all States and stakeholders, indeed of all humankind, and is characterized by high levels of uncertainty, normative ambiguity and institutional complexity, requiring an EIA practice that reflects both of these roles.

EIA of projects (physical undertakings) is typically differentiated from the assessment of policies, plans and programmes, which may be subject to a related process of strategic environmental assessment.[12] This report focuses on project assessment but addresses the relationship among different assessment tools.

Scope and Method of Report

At the centre of this report is a comparative analysis of 11 EIA systems, four of which operate in international settings and seven of which operate in regional (i.e., European Union) or domestic settings. Since the goal of the report is to identify implementation practices for EIA that appear well suited to the decision-making environment for DSM, our approach was to identify EIA systems that provided a cross section of decision-making environments that were salient to the target system (DSM). To this end, we chose our comparators with the following characteristics in mind:

- International agreements/institutions with decision-making authority (Antarctic Treaty; World Bank).
- International agreements with broad membership, as an indication of widely accepted norms/approaches to EIA (Espoo Convention; Convention on Biological Diversity (CBD)).
- Domestic EIA systems – developed countries (Canada; United States; Australia; EU/Netherlands).
- Domestic EIA systems – emerging economy/developing countries (China; South Africa; Jamaica).
- Geographic diversity (with EIA systems from North America; Europe; Africa and Asia; and including one small island developing State – Jamaica).
- All of the domestic EIA systems are in countries that are member States of the ISA, except the United States (the USA's EIA system was retained, as it is the pioneer legislation upon which many subsequent EIA systems were based).
- EIA systems that have been recent revised and likely to represent emerging trends in EIA regulation (Canada; Netherlands).

We use the term "EIA systems" to indicate the range of legal forms that EIA requirements and processes take, which include both legislation and supporting regulations, as well as formal treaties, but also guideline documents that provide direction to proponents and reviewing agencies on implementation. While each of the systems analyzed has unique features, the overall

comparability of the systems is retained as each EIA system contains the following core elements or stages, which are common to most EIA systems and are recognized in the literature as constituting a generic structure for EIA:[13]

- Screening.
- Scoping.
- Study content.
- Consultation/public participation.
- Decision-making.
- Post-project monitoring and follow-up.

These elements are examined across each of the study systems to ensure completeness of the analysis. Information respecting the elements is drawn principally from the primary legislative or policy documents setting out the requirements but is supplemented by secondary literature on the respective EIA systems. Completeness in this context is important, as the different stages of EIA are highly interdependent, and thus, while EIA systems can be usefully disaggregated, they must also be understood in their totality. Given the focus on fitness, particular attention is paid to the institutional setting of each EIA system, with the intention of situating the EIA processes in the broader decision-making context, including which entities or individuals have the authority to make decisions, the extent to which decisions are subject to formal (judicial) and informal (political) processes of review, and the broader normative context of the decision-making environment (i.e., to what degree are decision makers required to account for particular normative principles, such as precaution, harm prevention, sustainability, and ecosystem integrity). In order to keep the report as focused as possible, the presentation of the report does not serially describe the approach of each system on each element, but instead identifies and analyzes the distinct approaches within each stage with the intent of focusing on the broader forms of differentiation in implementation approaches. We include summary tables addressing key points across all comparators.

The suitability of approaches to implementation of EIA requirements for DSM is discussed in relation to each of the elements noted above. In order to provide context for this analysis, an overview of the institutional, normative and epistemic conditions surrounding DSM precedes the comparative analysis and provides the basis upon which the fitness of different implementation approaches is assessed. In describing the decision-making context for DSM, the report focuses on the international decision-making structure within the ISA. However, the report acknowledges and describes the responsibilities of sponsoring States in preserving and protecting the marine environment, which results in a multilevel governance structure that ought to be accounted for within the EIA requirements. Here the report draws on both primary documents of the ISA (e.g., LOSC, ISA regulations and guidelines) and secondary technical and scientific literature describing the DSM decision-making environment.

The Institutional, Normative and Epistemic Context for Deep Seabed Mining Approvals

This section provides an overview of the decision-making environment in which proposals to engage in DSM are considered. This description identifies three dimensions that are relevant to the development of EIA processes. The institutional context addresses the identity, structure and

capacities of the decision-making authority, the form of the decision(s) required to be undertaken, and the nature of the relationship between the proponent and the decision makers. The normative context refers to the principal legal obligations and background norms that will structure the decision-making process. Finally, the epistemic context refers to the characteristics of the knowledge environment of the assessment; for example, who controls or has access to required information, and the degree of uncertainty likely to be present. The purpose of this section is to provide an understanding of the conditions that ought to be accounted for in the development of EIA requirements.

Institutional Context

DSM activities are governed by Part XI of LOSC, which defines the jurisdictional competences of the relevant actors and creates the governing institutions and foundational legal obligations. Since the Area[14] (where DSM activities are carried out) is beyond the national jurisdiction of all States, Part XI creates the ISA, which has wide-ranging authority to regulate and oversee DSM activities through its various organs. As a treaty organization, the ISA will reflect the interests of its members, but it also has a wider obligation to act on behalf of the interests of "(hu)mankind as a whole".[15] The ISA is unique in that it is an international organization with direct regulatory authority over resource developers, which is structured through a contractual relationship between the ISA and resource developers (Contractors).[16] Once entered into, these contracts are for an extendable fixed term of 15 (exploration) or 30 years (exploitation).[17] They are protected through security of tenure provisions, which may only be revoked under a narrow set of circumstances,[18] and may only be revised with consent of both parties.[19] The Contractors may be States, State enterprises or private entities sponsored by a State.[20]

The ISA consists of a number of bodies with defined functions. The Assembly, made up of all of the State Parties to LOSC, is the supreme body, which operates in a largely legislative function on the recommendation of the Council. Through the Council and Assembly,[21] the ISA has adopted a number of regulations governing mining exploration.[22] The regulations for the exploitation stage of DSM remain in draft form.[23] The Council, which consists of an elected subset of State Parties, is the central approval authority for mining activities and makes all major regulatory decisions, based on recommendations from the Legal and Technical Committee (LTC). The voting rules for the Council require a two-thirds majority, including a majority in each of the Chambers, to overturn a LTC recommendation for approval of a Plan of Work, which places a high emphasis on the original recommendation of the LTC.[24] The LTC is made up of experts appointed for fixed terms. LTC members, who serve in a personal and not representative capacity, are not employed by the ISA and meet at fixed intervals to conduct their work.[25] The Secretariat of the ISA supports the various bodies, and is able to provide some technical expertise, but does not play any formal role in the regulatory decision-making structure.[26] Despite its regulatory role, the ISA operates in the manner of a treaty organization, conducting business at annual or semi-annual meetings. There is provision for the ISA to develop internal enforcement capacity (through an inspectorate) but that has not been acted upon to date.[27] The functional limitations of the ISA differentiate it from other domestic departments and agencies that oversee EIA processes, which typically have permanent, expert staff to provide input and evaluate EIA processes and outputs.

The principal vehicle for the approval of DSM activities is a plan of work submitted by the Contractor, which is subject to approval by the Council, with a prior review and recommendation by the LTC. A plan of work requires an assessment of the potential environmental impacts of the proposed activities.[28] An approved plan of work shall also contain an environmental management and monitoring plan (EMMP), with which the Contractor is obliged to comply over the duration of the contract. The contract area may be up to 150,000 km^2, with 75,000 km^2 of exploitation area.[29]

In practice, the approvals process is staged, with an initial exploration contract being issued, subject to an approved plan of work, for the exploration activities. The plan of work for an exploration contract requires "a preliminary assessment of the possible impact of the proposed exploration activities on the marine environment".[30] A further, more detailed assessment is required after the plan of work (for exploration) has been approved (and contract granted) but before exploration activities are commenced. The EIA at this pre-exploration stage is not connected to any further permit or approval.[31] The LTC has issued technical guidance for conducting EIAs at this stage.[32] If a Contractor decides to move ahead with exploitation activities, it will be required to submit a new plan of work for the exploitation phase, supported by a further environmental assessment. This EIA is tied to the approval of the exploitation phase plan of work.

Part XI of LOSC does not directly address questions of consultation or public participation as an element of the assessment or plan of work approvals process.[33] In practice, the ISA does provide avenues for stakeholders to provide comment on legislative matters (such as the draft Exploitation Regulations) and has received comments on EIAs conducted in relation to exploration activities.[34] The ISA has a system of observers, allowing non-member States, UN and other international organizations, and non-governmental organizations to participate in meetings of the Assembly and Council. LTC meetings are not open to observers.[35] With the exception of Contractors, stakeholders that are non-State entities possess few legal rights (such as the right to seek judicial review of decisions) in the ISA's fora, including the Seabed Disputes Chamber (SDC). Contractors, on the other hand, have rights of recourse to the SDC where plans of work have not been approved.[36]

The ISA is not the sole regulatory authority with oversight responsibilities for DSM. Sponsoring States are also obligated to exercise due diligence in their oversight of Contractors under their sponsorship,[37] including taking all reasonable steps to ensure that the DSM activities do not cause significant harm to the marine environment—an obligation which includes ensuring that EIAs are carried out.[38] The result is a multilevel regulatory system, with both the ISA and sponsoring State having due diligence responsibilities to protect the environment.

Normative Context

Decisions respecting DSM activities are not made in a normative vacuum; rather they respond to the broader goals and principles of LOSC, and Part XI, in particular. Central to the normative landscape of DSM is the status of the Area and its resources as the "common heritage of (hu)mankind".[39] As noted, this speaks to the ISA's responsibility to ensure that activities in the Area are carried out for the benefit of humankind as a whole. Article 145 addresses the ISA's

responsibilities to ensure effective protection of the marine environment, which are further elaborated upon in Part XII of LOSC. Of particular salience is article 206, which requires the assessment of the potential effects from planned activities that may cause significant adverse impacts to the marine environment. Sponsoring States are under a similar set of obligations.

The obligation to protect the marine environment is a due diligence obligation, which requires that responsible entities take all reasonable steps to preserve and protect the marine environment.[40] This is operationalized in Part XI of LOSC through a requirement that prevents the approval of exploitation activities "where substantial evidence indicates the risk of serious harm",[41] and a requirement that all proposed plans of work comply with the "relevant provisions of this Convention and the rules, regulations and procedures of the Authority".[42] Due diligence is further defined by the obligation in article 145 requiring "effective protection for the marine environment from harmful effects which may arise from [deep seabed mining] activities".[43] EIA processes are the central mechanisms by which evidence of the potential for serious harm and the adequacy of effective protection through, *inter alia,* the identification of mitigation measures will be determined, and, by extension, through which due diligence obligations can be discharged.[44] In addition, due diligence provides a standard by which the adequacy of EIAs can be assessed; that is, responsible entities must conduct EIAs in a manner that meets the standard of reasonableness, as reflected by prevailing international and domestic EIA practices.[45]

Beyond the specific requirements of LOSC, there are principles of sound environmental practice that further inform the decision-making environment surrounding DSM that are generally acknowledged by States as being fundamental. Among the principles identified in the current draft of the exploitation regulations, and strongly supported by international practice,[46] are the protection and preservation of the marine environment (including biodiversity and ecological integrity), precautionary principle, application of the ecosystem approach, and accountability, transparency and encouragement of public participation.[47] The SDC identified the precautionary approach and the adoption of best environmental practices as core elements of due diligence in the context of DSM.[48] The requirement to adopt best environmental practices applies to the development of EIA requirements—again reflecting the obligation on the ISA and sponsoring States to adopt the highest standard of environmental assessment practice in relation to planned DSM activities.

The ISA has developed an Environmental Management Plan (EMP) for the Clarion-Clipperton Zone, with the intention of identifying key ecosystem structures and functions on a regional level, and to identify protection and management strategies.[49] Further Regional Environmental Management Plans (REMPs) are contemplated for other regions subject to multiple exploration contracts. These types of subsidiary environmental management tools provide a further level of normative direction to which EIAs will need to respond.

Epistemic Context

The ability of those engaged in assessing the potential environmental impacts from DSM activities will be challenged by the novelty of the mining activities in the Area and by a natural environment about which scientific knowledge is limited. DSM is a new undertaking without a lot of clear analogues. Even in marine areas within national jurisdictions, there has been limited

experience with mining activities. Much of the equipment currently being developed is specific to the deep seabed activities, with limited testing to date. The literature examining the potential impacts of DSM identify the limited amount of existing data as a major barrier.[50] Scale effects may be particularly challenging given that the data that does exist relates to small-scale test areas, while mining activity, especially of polymetallic nodules, could involve very large sites. One study highlights 13 knowledge gaps that include "a lack of operation details respecting mining activities, limited samples and lack of standardization of existing samples, lack of knowledge respecting species density and diversity, including undescribed species, and a consequent lack of understanding of responses to disturbances from mining activities."[51] One important implication of the high degree of uncertainty present in this context is that the legal requirement of avoiding "serious harm" will remain ambiguous until measurable parameters for determining harm are established and agreed upon; a process which involves both scientific and political judgment.[52]

A significant source of new scientific information respecting DSM will be the assessments undertaken in support of the plans of work, as well as post-approval monitoring of environmental conditions. Since these activities will be carried out by the Contractors themselves, there is potential for considerable informational asymmetry between the Contractors and the approving authorities. In addition, questions may arise respecting the degree to which scientific information, which may have proprietary value, may be subject to confidentiality requirements contained in Part XI. The ISA has long recognized the importance of developing standardized and accessible data on the deep seabed environment and has developed a database to facilitate sharing and transparency of scientific data, including data from assessments and reports provided by Contractors.[53]

Environmental Impact Assessment: Comparators and Fitness for DSM Assessments

EIA has its legislative origins in the U.S. federal *National Environmental Policy Act* (NEPA), which was enacted to declare the federal government's environmental policy goals that should inform decisions that have potential consequences for the environment. Recognizing that the articulation of policy goals by itself would be insufficient to ensure that environmental considerations were appropriately accounted for, NEPA required all federal agencies to prepare a "detailed statement" that would accompany, and be considered alongside, recommendations for major federal actions. The detailed statement has been described as "action-forcing" in the sense that it requires agencies to actively understand and account for the environmental consequences of their decisions.[54] The aim of the EIA document and process that arose from NEPA was to act as a planning tool to aid decision makers in the exercise of their discretion. As such, decision makers retain the discretion to approve projects even in the face of predicted harms, so long as they adhered to the procedures for carrying out the assessment.[55]

The practice of EIA spread rapidly to other jurisdictions and was adopted by decision makers at the international, regional, national and subnational levels. The requirement to conduct EIAs in international law has focused on transboundary harm, with customary international law and treaties, such as the Espoo Convention, imposing obligations on States to conduct EIAs where activities under their jurisdiction have the potential to impact the environment of another State. In this context, EIAs are a necessary element of a State's obligation to take reasonable steps to

prevent significant environmental harm to other States. The same logic applies to areas beyond national jurisdiction, since the obligation to prevent harm extends to these areas. This obligation is reflected in unelaborated obligations, such as article 206 of LOSC, as well as in the more detailed rules found in the Antarctic Protocol. Since these obligations are directed towards decisions made by States, the rules are directed to establishing minimum requirements for EIAs carried out under State jurisdiction and towards project decisions made within the State. In contrast, the CBD is not directed primarily at transboundary harms, but at biodiversity impacts generally.[56] As such, the approach to EIA is much more permissive, with the operative provision being qualified in such a way as to leave a high degree of discretion with States as to the manner of EIA implementation. In light of the open-textured quality of the CBD EIA requirements, State Parties to the CBD have chosen to elaborate the particulars of implementing biodiversity-inclusive EIA through a series of guideline documents.[57]

International organizations, which have independent decision-making authority, such as development banks, have also adopted EIA processes. Here, the EIA rules operate directly on the international organization and its decision-making authority. The ISA falls under this latter category, as the EIAs contemplated will attach themselves to the ISA's decisions and not those of sponsoring States.

As an environmental planning tool intimately tied to decision-making, EIA requirements necessarily reflect the decision-making context of the system in which they are implemented. Nonetheless, EIAs have tended to follow the same architecture developed in the early EIA systems (see Figure 1). While the overall architecture takes a similar form, different systems of EIA have adopted different approaches in implementing each of these elements. The analysis that follows reviews these different approaches, highlighting the suitability of various requirements for the DSM decision-making and regulatory environment.

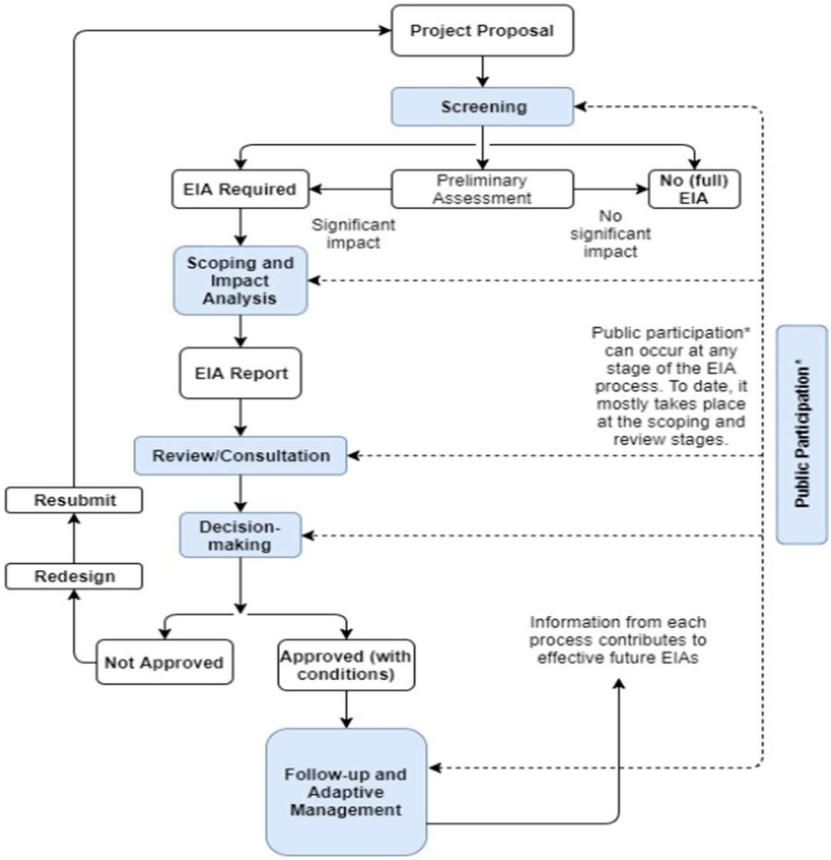

Figure 1. U.N. Environment Programme, "Assessing Environmental Impacts: A Global Review of Legislation" (2018). (See endnote No. 5.)

Application and Screening

The two initial determinations which must be made in relation to a planned activity are whether the activity falls within the purview of the EIA system, and, if it does, whether an EIA should be undertaken for the proposed activity. The first question is one of the application of EIA requirements, and is driven by jurisdictional matters and by the nature of the activity. In domestic EIA systems, the application of EIA is linked to the decision-making authority of the government agency in question. In international requirements, the EIA is triggered by the decision-making process of the international entity or the transboundary nature of a projected impact. For example, the World Bank's EIA process is triggered by the Bank's decision to finance an activity.[58] The Antarctic Protocol's EIA system applies broadly to any activity undertaken in the Antarctic Treaty Area.

Typically, EIA systems apply to physical undertakings, as opposed to policy decisions, which may be subject to strategic environmental assessment (SEA)—a related but separate process. The extension of environmental assessment processes to policies, plans and program provides an opportunity to ensure that environmental objectives are considered as part of the decision-making processes for these instruments, and provides an opportunity for stakeholder engagement in a more open and systematic process of developing priorities and long-term planning goals, as well as for managing competing uses. SEA enables the consideration of environmental concerns at an earlier point of intervention in a decision-making process. Leaving impact assessment until the project stage often narrows the range of alternatives that can be considered, reducing EIA to more technical considerations of methods to minimize harm from the project, instead of considering more consequential, policy-level factors, such as the need for a project and the consistency of State actions with long-term environmental and sustainability goals. SEAs may be better equipped to address cumulative and long-term effects, which EIA is poorly suited to address, given its project-level focus.

Several the comparator systems provide for the possibility of SEA or other higher-order assessments, but SEA remains less developed in EIA systems outside of Europe.[59] Under NEPA there have been efforts to tier SEA and EIA, whereby the findings and data established through SEA processes provide a basis for project-based assessment.[60] The EU has a separate SEA Directive, and there is a SEA Protocol under the auspices of the UNECE (Espoo Convention). SEA is encouraged under the CBD but is not required.

Once the scope of EIA application is determined, the second question that arises is which projects (assuming a project-focused EIA system) are subject to the EIA process. Given that there is a wide range of planned activities to which EIAs could potentially apply, EIA systems must adopt a process to determine which activities ought to be subject to EIAs. Since the underlying goal of EIA is to prevent significant environmental harm, the threshold is most often determined with reference to whether there is some likelihood or potential for significant environment harm from the activity,[61] the rationale being that it is not efficient to subject small-scale activities, or others that pose little threat to the environment, to EIA requirements.

There are two approaches adopted to address this question. The first is to conduct an "initial environmental assessment", the purpose of which is to determine the potential for a significant environmental impact. In effect, a preliminary, case-by-case assessment is undertaken, which determines whether a full EIA is required.[62] The use of initial environmental assessments as a screening mechanism results in two tiers of assessments: an initial assessment, cast widely, that assesses in a summary manner whether an activity is likely to have a significant impact, and then, if it does, a second "full" EIA is undertaken. The presence of a likelihood of a "significant environmental impact" is the default threshold used to determine whether a full EIA is required in international and domestic EIA.[63] The one exception in international law is found under the Antarctic Protocol, where an initial environmental evaluation (IEE) is carried out if a physical activity is thought to have at least a "minor or transitory impact". If the IEE shows potential for an impact that is "more than minor or transitory", a Comprehensive Environmental Evaluation (CEE) must be prepared.[64]

EIA in Multilevel Systems

In jurisdictions with multiple levels of government, there is a concern that a single project may be subject to multiple EIA requirements, leading to concerns over overlap and excessive burdens on project proponents. In both Australia and Canada, where there are EIA requirements at the state/provincial and federal levels, attention has been given to reducing overlap. Part of the strategies in both countries is to identify jurisdictional spheres. In Australia, the approach is to focus the federal EIA process on projects that affect "matters of national environmental significance", which focus on impacts on specific environmental features of national importance, such as wetlands, endangered species, the Great Barrier Reef, World Heritage sites and the marine environment (EPBC, sections 12—28). Canada similarly focuses its national legislation on areas of federal jurisdiction (e.g., migratory birds, aquatic species, federal lands) (IAA, s 2). Both jurisdictions also use bilateral agreements between the federal and subnational governments for the substitution of processes from one jurisdiction to satisfy requirements at both levels (IAA, section 31; EPBC, sections 45-56). In other international contexts, such as the Espoo Convention or the Antarctic Protocol, international instruments set out the requirements that the EIA must satisfy, including the requirement for circulation and consultation with other States, but these EIA requirements are conducted under the auspices of the member States' domestic laws.

The DSM context is more akin in this regard to federal States, in the sense that both the ISA and sponsoring States have oversight responsibilities that involve EIAs. The ISA cannot determine the minimum EIA requirements for sponsoring States under its current powers, but it could play a role in coordinating EIA requirements with sponsoring States. It is open for sponsoring States to adopt EIA study requirements that are consistent with the ISA's requirements to reduce overlap in the technical studies required. But sponsoring States must remain mindful that they cannot rely on the ISA to fulfil the sponsoring State's independent due diligence obligations.

The second approach uses specific lists of activities that require an EIA. If a proposed activity is categorized as a listed activity, a full EIA must be undertaken. The lists may identify specific categories of activities (e.g., dams, oil refineries, roads and mines) or may identify specific environmental features (such as projects in proximity to protected areas), and may be qualified by some further quantified measure (such as roads over 50 kilometres or electrical generating stations greater than 1 megawatt). In effect, a list identifies those activities which are presumptively likely to cause significant environmental effects. The use of lists has the advantage of providing greater certainty for proponents but may fail to recognize the contextual conditions of a specific project that influence the project's potential for environmental harm.

Some jurisdictions use both inclusion lists and exclusion lists (identifying activities that are exempt from EIA requirements).[65]

It is commonplace for EIA systems to use hybrid systems incorporating elements of both approaches. For example, under the Canadian *Impact Assessment Act*, a project will trigger an assessment if it is on the "Project List" or if it is designated by the Minister to require an EIA.[66] Similarly, the Netherlands uses a positive activity-based list, as well as a case-by-case assessment of activities based on their potential to cause significant environmental effects.[67] Some EIA processes also adopt a more complex form of process differentiation during screening. For example, in China, the process of screening separates projects into those which must undergo a full, comprehensive EIA from projects which are subject to a less detailed assessment, as well as those that require no assessment at all.[68] The Australian system provides for six different approaches for assessment based on the complexity and risk of the proposal and the degree/type of public consultation required.[69]

In some cases, screening decisions are self-assessments made by the proponent,[70] but screening decisions are more often subject to agency oversight.[71] In other instances, the screening decision is made directly by a responsible agency or authority.[72]

Table 1. Screening

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
List[i]	No	Recc.	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes
Initial EA[ii]	Yes	Recc.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Process differentiation[iii]	No	Recc.	No	Yes	Yes	No	Yes	No/ Yes	No	Yes	No

[i] Whether a list (e.g., activity-based list) is provided for screening.
[ii] Initial environmental assessment carried out to determine the potential for significant environmental impact.
[iii] Whether the type of project or severity of the predicted effects determines the type of EIA study conducted.

DSM Considerations

Although it is beyond the scope of this report to assess in detail the utility of using SEA processes in relation to the ISA's policies, plans and programmes, we note that there is not a positive legal obligation on the ISA to assess policies, plans and programmes. Article 206 of LOSC references only "planned activities", and the due diligence obligation that underlies the EIA obligation relates only to physical undertakings. Second, the policy instruments being contemplated by the ISA, such as REMPs, are already environmental policies (and could be considered a form of SEA), and as such, do not require a specific policy direction to account for environmental matters. This is not to say that environmental policies cannot benefit from the procedural safeguards around transparency and participation that are typically found in SEA processes.[73] From an EIA perspective, the more important consideration is, where there are higher-order environmental policies, that these be functionally linked to the EIA process in such a way that those preparing EIAs must account for the policies, and objectives found in other policies, plans and programmes adopted by the ISA.[74] The remainder of this report focuses on project EIA.

The process of identifying to which activities EIA should apply in relation to DSM appears quite straightforward because of the restricted types of projects subject to ISA approval. Unlike most

EIA systems, which must filter through a large diversity of potential activities with varying potential to impact the environment, the ISA considers only two types of DSM activities: exploration permits and exploitation permits. Both are presumptively subject to EIA requirements. The former is subject to EIA requirements under the existing regulations, while the latter is anticipated to be subject to the EIA requirements of the forthcoming exploitation regulations. The approach is akin to a list-based approach in the sense that an EIA is automatically required without any further consideration of the potential for significant impact, as impacts from exploration and exploitation activities are presumed.

The trigger for an EIA under the exploration rules requires some further examination. At present, the exploration regulations require, prior to the approval of a plan of work and exploration contract, a "preliminary assessment of the possible impact of the proposed exploration activities".[75] The assessment is only preliminary because prior to exploration work, part of the purpose of which is to gather oceanographic and environmental data to enable an assessment, there is a limited basis respecting impact which can be made. Instead, the contract terms require that a further assessment be undertaken prior to the commencement of exploration activities.[76] There is a guideline document that provides further direction for the preparation of assessments in the exploration stage, including a list of activities that can be carried out without an EIA and a further list of activities that do require an EIA.[77] As structured, the EIA does not inform any formal decision or approval to be given, but it is subject to review and acceptance by the LTC.[78] Screening triggers are typically found in binding documents, with clear avenues of recourse should a disagreement arise over their application, not guidelines (as is the case here).

In relation to exploitation activities, EIAs will be required prior to the approval of a plan of work. Given the length of exploitation contracts, it is reasonable to account for changes in the project that may occur over time. Applying assessment procedures to changes to activities is a standard provision within EIA systems. For example, the Antarctic Protocol includes the following provision:

> The assessment procedures set out in Annex I shall apply to any change in an activity whether the change arises from an increase or decrease in the intensity of an existing activity, from the addition of an activity, the decommissioning of a facility, or otherwise.[79]

As implemented in the Antarctic system, a change would be subject to the same screening process as another activity, so the change would require an IEE if it has at least a "minor or transitory impact" (but no assessment would be required if it were found to have less than a minor or transitory impact). In the DSM context, it would be in keeping with prevailing EIA practices to employ a threshold test for changes to approved activities, such that changes to activities that have potential to cause a serious environment impact ought to be caught. The sensible trigger for capturing changes would be a change to the approved plan of work, which provides a decision-making point. As currently contemplated, a new plan of work is required where there is a "material change" in the operations. The current definition of "material change" likely captures any changes that would be likely to have a serious environmental effect.[80]

Scoping and Report Preparation

Once a determination that an EIA is required has been made, the scope of the environmental assessment study must be decided upon. Given the variation in types of projects typically subject to assessment, as well as the unique biophysical and social circumstances in which the projects are proposed, it is desirable that the study undertaken be tailored to reflect the project context. EIA legislation and guidance documents provide some general indication of the requirements of the required study, which typically include a description of the project, a description of the affected environment, the identification of potential impacts, and measures that may be taken to mitigate those impacts, including the identification of alternative (non-preferred) ways of carrying out the project.[81] However, these requirements are provided with a high level of generality, requiring an initial process to arrive at what are effectively terms of reference for the study.[82]

An important initial question is the extent to which the assessment restricts itself to biophysical impacts or also considers a broader range of direct and indirect effects from the project. The Espoo Convention uses the following definition of "impact":

> "Impact" means any effect caused by a proposed activity on the environment including human health and safety, flora, fauna, soil, air, water, climate, landscape and historical monuments or other physical structures or the interaction among these factors; it also includes effects on cultural heritage or socio-economic conditions resulting from alterations to those factors.[83]

This definition, which supports extending the EIA study to include socio-economic impacts, but only insofar as they arise from changed environmental conditions, is consistent with other EIA systems. Some systems go further in requiring more direct assessment of social impacts. Canada, in particular, includes a number of provisions ensuring the specific impacts on Indigenous communities, including impacts on "the current use of lands and resources for traditional purposes".[84] Attention to the impacts on Indigenous peoples is also identified in the CBD, and is reinforced by the adoption of the Akwé: Kon Voluntary Guidelines under the CBD,[85] as well as in the World Bank requirements.[86]

Assessment of cumulative impacts, which are defined as the "incremental impact of the action when added to other past, present, and reasonably foreseeable future actions"[87] in NEPA, is required in the EIA systems for, *inter alia,* the Antarctic,[88] the World Bank, and the EU. Where cumulative impacts are likely to influence environmental outcomes, they should, of course, be accounted for. However, cumulative impact assessment does raise questions regarding the spatial, temporal, and sectoral boundaries of EIA studies, particularly where issues of ecological connectivity are uncertain, leading to the development of further guidance documents on cumulative impact assessment in some jurisdictions.[89] Accounting for cumulative impacts in relation to biological diversity and climate change has raised specific challenges, which again has led to the development of guidelines providing further details on how to incorporate these issues into an EIA.[90]

The identification and evaluation of alternatives is a widely accepted requirement in EIA, but there are variations in the range of alternatives considered. Under NEPA, where the requirement for alternatives originates, the regulations note that the environmental impacts of the proposal and its alternatives should be presented in "comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public".[91] The assessment of alternatives recognizes that in many planning contexts there are no clear standards for determining whether the impacts are significant. In these circumstances, alternatives provide a relativistic basis for assessing projects, with a goal of encouraging proponents to advance the least impactful alternative. Among the required alternatives to be assessed under numerous systems is the "no action" alternative.[92] For example, the Antarctic Protocol requires the assessment of "possible alternatives to the activity, including the alternative of not proceeding".[93] The intent is to require the proponent to consider the need for the project and to assess the environmental benefits of not proceeding against the economic benefits of going ahead with the project. The Canadian *Impact Assessment Act* requires consideration of both "alternative means of carrying out the designated project" and "alternatives to the designated project".[94] The latter requires a more wide-ranging assessment of how the same objective may be achieved in another manner. Both forms of alternatives are qualified by the requirement to only assess those alternatives that are "technically and economically feasible".[95]

The recognition of uncertainty and the application of the precautionary principle finds expression directly and indirectly in EIA requirements. EIAs should identify areas of uncertainty and evaluate the implications that knowledge gaps may have on the assessment.[96] The CBD Guidelines suggest the incorporation of a risk framework whereby higher risks require greater certainty of information, while lower-risk activities can tolerate higher levels of uncertainty.[97]

A central component of any EIA study is the identification of mitigation measures that can eliminate or reduce the environmental impacts to acceptable (non-significant) levels. The range of mitigation measures addressed in the environmental impact study varies among systems, but there is increasing recognition of the value of using a "mitigation hierarchy", particularly in relation to effects on biological diversity. For example, the CBD Voluntary Guidelines stress the importance of prioritizing avoidance or prevention measures over compensation measures, such as offsets.[98] The identification of offsets as an approach to address biological diversity loss is included in the Australian and EU/Netherlands EIA requirements.[99] Mitigation measures are best considered within the EIA process, as different approaches will have implications for the degree of impact, and ought to be subject to the consultation requirements of the EIA process.

Scientific Uncertainty in the DSM

Although not part of this study, New Zealand's environmental and mining regimes are useful examples to take note of, as they contain legislative and regulatory requirements specific to offshore mining activities and have been applied to several marine consent applications for offshore mining. New Zealand's *Resource Management Act, 1991 No 69* (RMA) and *Crown Minerals Act, 1991 No 70* (CMA) govern activities in the territorial sea. Beyond that, offshore mining activities are regulated by the CMA and the *Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act, 2012 No 72* (EEZ Act), which covers activities that were not previously regulated in these marine areas, including, but not limited to, seabed mining. The EEZ Act contains similar EIA provisions to the consent application process provided for under the RMA (EEZ Act, sections 39—43 and 88).

A central area of controversy surrounding marine consents for mining has been the interplay between knowledge gaps and adaptive management approaches. For example, Trans-Tasman Resources Ltd. was granted consent for its project in the South Taranaki Bight under the EEZ Act by the Environmental Protection Authority (EPA). This consent has since been rescinded after two subsequent judiciary appeals, as knowledge gaps and a lack of baseline data raised questions as to the adequacy of the EIA and the application of the precautionary approach and adaptive management principles. Citing the information principles under Section 61 of the EEZ Act, the Court of Appeal acknowledges that a lack of scientific certainty is not enough to reject an application, as the seabed context is inherently uncertain (*Trans-Tasman Resources Ltd v Taranaki Whanganui Conservation Board and The Environmental Protection Authority* [2020] NZCA 86, para 128). However, "if the lack of information and resulting uncertainty about the effects of a proposed activity mean that the EPA is left uncertain whether the s 10(1) objectives will be met if a consent is granted, then the information principles require that consent to be refused" (*Trans-Tasman*, para 128). Knowledge gaps could not be cured through resort to adaptive management, as such an approach was not allowed in relation to marine consents, owing to the potential risk to the environment (*Trans-Tasman*, para 116).

In terms of process, there are two points of differentiation among different EIA systems: the degree of required public consultation in the scoping process and the degree of agency involvement and oversight. There is wide acceptance of including public consultation as an integral part of the scoping process, which reflects the understanding that scoping decisions are both highly consequential and involve the exercise of discretion in ways that can profoundly influence the outcome of EIA studies, for example, by limiting the examination of alternatives.

For similar reasons, most systems include some formalized oversight of the scoping process. For example, in South Africa, the proponent prepares a scoping report, which includes a Plan of Study for the EIA, which is subject to a 30-day period of consultation (through notice and comment). A final scoping report that summarizes the input received is submitted to the competent authority for approval.[100] In jurisdictions like China, Canada and the US, where the approach is agency-led, the responsible agency prepares a scoping document, which is typically subject to public comment prior to being finalized. In systems where the EIA process is co-ordinated through a central agency, such as the Impact Assessment Agency in Canada or the World Bank task team, this body directs or provides input into the scoping process. The exception to having some central coordination over the scoping process is the Antarctic Protocol, which leaves discretion in the hands of the Contracting Parties, an approach that reflects the limited institutional capacities of the Antarctic Treaty bodies.

Table 2. EIA Study Requirements

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
Socio-economic impacts	Opt.	Recc.	Req.	Req.	Opt.	Req.	Req.	Opt.	Req.	Req.	Req.
Cumulative impacts	Req.	Recc.	Opt.	Req.	Recc.	Req.	Opt.	Req.	Req.	Req.	Req.
Alternatives[i]	Impl.	Impl.	Both	Impl.	Both	Both	N/A	Both	Impl.	Both	Both
No action alternatives	Req.	Recc.	Req.	Req.	Req.	Opt.	Opt.	Opt./ Req.	Req.	Req.	Req.
Knowledge gaps	Req.	Recc.	Req.	Req.	Opt.	Opt.	Opt.	Req.	Req.	Req.	Req.
Nontechnical summary	Req.	Recc.	Req.	Req.	Req.	Req.	Opt.	Req.	Req.	Req.	Req.

[i] Either only requires implementation ("impl") alternatives or both implementation and project alternatives.

Table 3. Scoping Procedures

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
Scoping report	Varies	Varies	Varies	Req.	Req.	Req.	Opt.	Opt./ Req.	Req.	Req.	Req.
Report prepared by	OS[i]	OS	OS	BS[ii]	Prop.	Prop. & agcy	Third party	Prop.	Prop.	Third party	Lead agcy
Consultation required	Req.	Recc.	Req.	Req.	Req.	Req.	Req.	Req.	Req.	Req.	Req.
Oversight	Varies	Varies	Varies	Bank	Gov't dept.	Gov't agcy	Gov't dept.	Gov't dept.	Gov't agcy	Gov't dept.	Prop.

[i] Originating state
[ii] Borrowing state

DSM Considerations

At a minimum, the scope of EIAs for DSM activities ought to follow the range of impacts that are required to be protected under LOSC. The definition of "pollution of the marine environment" includes "deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities…impairment of quality for use of sea water and reduction of amenities".[101] As such, the social and economic dimensions of harm are to be included where they arise as a result of the physical effects of the proposed activity. Article 147 of LOSC requires the activities in the Area be carried out with reasonable regard for other

activities in the Area, which might include underwater cable installation, shipping and fisheries. EIAs are well suited to consider issues of reasonable regard for other ocean users given their open and participatory nature. Moreover, the assessment of alternatives provides opportunities for other users to assess the impact of various operational alternatives in light of their own interests and preferences. Researchers have raised concerns respecting the potential for DSM activities to impact the cultural or economic interests of Indigenous persons,[102] which may need to be assessed on a case-by-case basis.

The issue with cumulative impacts is not whether they should be addressed as part of an EIA,[103] but rather identifying appropriate study boundaries and approaches to cumulative impacts assessment that balance the need for a comprehensive environmental understanding against the burdens on proponents. There is potential for mining projects to result in cumulative impacts, particularly in areas such as the Clarion-Clipperton Zone, where project boundaries may abut one another. Assessing cumulative impacts will likely require a degree of coordination between proponents and perhaps some coordination between proponents through the ISA. Additionally, the conditions of ecological connectivity remain uncertain in the deep seabed environment. A precautionary approach, which has been accepted as appropriate in the DSM context, would err on the side of more extensive study boundaries, until impact modelling improves. Given the need for coordination, cumulative impact assessment may also be addressed through upstream planning documents, such as REMPs. Current guidance of EIAs for exploration activities contemplates that provision of data in agreed-upon forms in order to facilitate high-order planning, including cumulative impact assessment.[104] Further guidance on the assessment of cumulative effects, including accounting from impacts from other ocean uses, may be required, as has been the case in other EIA systems.

A related consideration is whether the ISA would allow for Contractors to phase mining approvals such that they would only seek a plan of work for part of their mining area and submit an EIA on that part only. The concern here is a form of "project splitting" whereby the full impact of the project is not assessed because each phase is assessed independently. Phasing itself may be a desirable approach to plans of work, but assessment approaches will need to account for the cumulative impacts of the project as a whole. There may also be temporal concerns where there are significant time lags between phases.

There is a strong functional linkage between the activities in the exploration stage and the scoping of EIAs for exploitation, in that many of the exploration activities are oriented towards gathering scientific baseline information in anticipation of the assessment needs for exploitation. Requiring Contractors to identify EIA requirements for exploitation as early as possible may obviate the need for costly adjustments to study boundaries or other parameters later in the process.

The nature of mining activities is that the complete avoidance of impacts is not feasible. All of the anticipated DSM exploitation activities involve large-scale disturbances. The acceptability of those disturbances will turn on the assessment of whether the proposed plans provide effective protection of the environment, and result in the prevention of significant impacts. While the degree of regulatory specificity for assessing DSM is still to be determined, there is considerable likelihood that determining "significance" through quantifiable regulatory standards will face

significant epistemic challenges.[105] If this is in fact the case, then the identification of alternatives will be critical, as alternatives assessment may provide information on a range of potential operational approaches with varying impact profiles. For example, proponents may assess the impacts of alternative levels of mining intensity and duration. Given the ubiquity of alternatives assessment in EIA, it may be understood to represent a best practice for EIA. However, there are potential challenges, such as determining what is the reasonable range of alternatives to assess, particularly in light of the specialized technologies, which may limit the extent of technically and economically feasible alternatives. The draft Exploitation Regulations do not include requirements for the assessment of alternatives.[106] The assessment of a "no action" alternative is likewise not included, but may be a problematic fit for the DSM regulatory structure, where the Contractor acquires contingent rights, subject to satisfying, inter alia, the requirements for effective protection of the marine environment, to develop mining operations with the granting of an exploration license.[107] Broader questions respecting the need for DSM activities may be better addressed through strategic planning initiatives.

Scoping decisions are highly consequential because they establish the content and boundaries of the subsequent study. While a number of EIA systems provide a measure of discretion to the proponent to determine the scope of EIAs on their own, the prevailing approach is to provide greater oversight and opportunities for consultation as the potential for harmful environmental consequences increase. Oversight ensures that EIAs are being carried out with a degree of consistency and minimizes the potential for major inadequacies in the study being discovered at later stages in the EIA process. There remain important questions, however, over which body may provide oversight. Most logically, the LTC could provide input into the scoping process, without necessarily approving a scoping report. The LTC has the authority to "supervise" activities in the Area, which could reasonably include oversight over the EIA process.[108] The LTC already reviews completed environmental impact statements under the exploration approvals.[109] The draft Exploitation Regulations contain no such oversight mechanisms.[110]

Public Consultation

Consultation with a wide range of stakeholders is an essential element of EIA. Requirements for public consultation are present in every EIA system and recognize the centrality of EIA to the legitimation of decisions that may affect the environment. Despite the universality of consultation requirements, the approach to consultation varies across a number of elements. First, there are differences in the requirements for consultation at different stages of the EIA process. There is potential for consultation at the screening, scoping and study report stages, and consultation throughout the EIA process has been identified as vital.[111] In practice, consultation at the screening stage is typically discretionary or not required,[112] but public notification of the screening decision is often required. There are mandatory requirements for consultation during the scoping and study stage.[113] At the study stage, some systems provide for consultation where the environmental impact study is still in draft form, with the consultation informing the preparation of the study in final form through the incorporation of information and comments gathered through consultation.[114] Alternatively, consultation may occur only after the study has been finalized, with consultation informing the deliberations on the decision respecting the project. The former may have some benefit in improving the quality of the study in final form.

The form of consultation generally requires notification, the availability of detailed information respecting the EIA, often in the form of a draft EIA study, and the opportunity for members of the public to provide comments. In a number of instances, usually in cases involving large-scale and potentially controversial projects, EIA legislation provides opportunities for public hearings to be held.[115] The public hearings themselves may range from public meetings to more formal judicial-like proceedings involving the calling of evidence and opportunities to cross examine.[116] There is often a linkage between the potential for, and scale of, harm and the elaborateness of consultation processes.

The World Bank has adopted a unique mechanism, whereby persons affected by a Bank's decision in relation to a project may seek a compliance review through the Bank's Inspection Panel. In addition to assessing compliance, the Inspection Panel provides a "citizen-driven accountability mechanism …[that] promotes more inclusive and sustainable development by giving projected-affected people a greater voice in Bank-financed projects that impact them".[117] The Inspection Panel operates at arm's length from the Bank and provides an independent assessment of the pre-approval process.

Determining who is entitled to notification and consultation also involves varying degrees of discretion exercised by either the proponent or the responsible authority, although the prevailing approach is to allow for broad public consultation with anyone that expresses an interest in the EIA.[118] There are examples of consultation obligations that are restricted to those persons that are directly affected.[119] The Antarctic Protocol, the CBD and the Espoo Convention all include requirements for public consultation, suggesting that public consultation is an international requirement.[120]

Identifying non-governmental organizations that have rights of consultation is addressed in a number of jurisdictions. For example, the EU defines persons having an interest to include "non-governmental organisations promoting environmental protection and meeting any requirements under national law".[121] Consultation requirements may also include the obligation to consult other governmental agencies whose mandates are potentially affected by the project or who may provide further expert review.[122] In the Antarctic Protocol, for example, there are specific requirements for the Committee for Environmental Protection to consult with the Scientific Committee on Antarctic Research, the Scientific Committee for the Conservation of Antarctic Marine Living Resources, and other relevant bodies.[123] In several jurisdictions, particular attention is paid to the obligation to consult Indigenous groups, with the obligation being linked to human rights obligations arising under international instruments, particularly the United Nations Declaration of the Rights of Indigenous Peoples, as well as domestic constitutional requirements.[124]

Finally, there are questions arising respecting the obligations of proponents to consult with other States. The basic rule, which is reflected in the Espoo Convention, links the consultation requirement with the potential for the project to have a significant impact on the environment of another State. Article 14(1)(c) of the CBD notes that the obligation to notify and consult extends to projects that are likely to affect the biological diversity in areas beyond national jurisdiction, as well the biological diversity of other States. In the CBD context, the Convention recognizes the need for further international arrangements to facilitate consultation in areas beyond national

jurisdiction. A similar obligation exists under the Antarctic Protocol, which requires circulation of a draft CEE to all Parties and to the Committee for Environmental Protection.[125]

The underlying goal is to ensure that consultation is "meaningful" in the sense that the public has sufficient information and opportunity to understand the risks and benefits associated with the project, as well as access to appropriate avenues to make concerns known to decision makers.[126] Meaningfulness also imposes obligations on the decision makers to take due account of the information received through consultations and remain open-minded about the outcome.[127] To this end, once a consultation period has ended, the entity responsible for receiving comments, which may be the proponent or a responsible agency, is required to provide a summary of the comments received that accompanies the EIA, in order for the decision makers to understand the nature of the concerns with the project and its assessment.[128] In cases where a draft study report is released for consultation, the final report may be amended in response to the comments or will otherwise identify how the comments were responded to, with the idea of making the EIA process more iterative and justificatory.[129]

Table 4. Consultation Requirements

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
Screening	Varies	Varies	Yes	Yes	Yes	Yes	N/A	Varies	No	No	Varies
Scoping	Yes	Recc.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Draft Report	Yes	Recc.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Final Report	No	Recc.	Yes	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes

DSM Implications

Articles 205 and 206 of LOSC set out the baseline obligations for notice and consultation for EIAs, which require that the EIA reports be communicated to competent international organizations, which should, in turn, make those reports available to all States.[130] In relation to DSM, the ISA is very clearly the competent international organization, which is obligated to facilitate notice to all States, but questions remain regarding which elements of the EIA process ought to be subject to consultation requirements, the extent of consultation requirements beyond States, and the precise form or modalities of consultation.

As discussed above, the screening processes for DSM EIAs are not likely to be complicated owing to the exclusive focus on DSM, and the ability of the ISA to develop clear rules regarding when EIA obligations arise. The one area where consultation would be appropriate in screening processes is where the Contractor proposes material changes to an approved project and a decision is necessary as to whether the change ought to be subject to a further EIA.[131] Scoping processes, on the other hand, are more likely to generate concern, and will likely benefit from broader consultation. The novelty of DSM activities and the absence of established assessment methodologies militate in favour of consultation at the scoping stage, since open scoping processes may identify potential issues and interests that might not be identified by the proponent or through review of a scoping report.

While article 205 identifies all States as being appropriate to notify either directly through publication of reports or through competent international organizations, article 142 specifically

identifies that coastal States have specific rights in relation to "resource deposits in the Area which lie across limits of national jurisdiction".[132] The SDC also notes that the customary rules respecting transboundary harm would extend rights associated with EIA to coastal States whose environment may be affected by DSM activities. Facilitating notice and consultation through the ISA raises questions of whether notification ought to occur through the existing organs of the ISA, namely the Council or Assembly, or through a more individuated process. The difficulty with using the Council is that the Council's membership is limited, whereas the Assembly is not directly involved in decision-making processes regarding DSM plans of work. The model used by the Antarctic Protocol, which requires that draft EIA reports be provided to both the Committee for Environmental Protection and to Contracting Parties, is consistent with article 205, which indicates that EIA reports ought to be made available to all States in addition to the ISA (the competent international organization). The current practice of the ISA is to post EIA documents on its website for review and comment.[133] The process in the Antarctic Protocol does raise questions of the rights of States that are not Contracting Parties, which also has relevance to the ISA process.

The more ambiguous question concerns the consultation requirements for other stakeholders. Restricting consultation to those persons or organizations that are directly affected by a DSM project would likely be viewed as being overly narrow given the limited number of interests that may be affected in the vicinity of DSM activities. Given the obligation to have reasonable regard to other activities in the Area, consultation with other established marine use groups, such as fishery and cable interests, would be a minimum. The status of the Area as the common heritage of humankind provides a sound basis for an inclusive approach to consultation. The definition of "stakeholders" within the draft Exploitation Regulation is broadly inclusive.[134] Providing for general notification (through electronic posting of notice and information respecting the EIA) and not restricting who may provide comments is in keeping with the current approach under the exploration regulations and with general EIA practice.

Consultation with other international bodies is consistent with good practice, particularly if DSM activities are likely to have environmental impacts affecting matters subject to the interests of those bodies. For example, regional fisheries management organizations, regional seas commissions or shipping organizations may have particular expertise in the interaction between proposed DSM activities, and their areas of expertise could be relevant to assessments. A number of such organizations currently have observer status in the ISA.[135]

As for the modalities of consultation, notification, exchange of information and the opportunity to provide comments are the baseline requirements. In the Antarctic Protocol, which faces similar questions regarding the identification of the public in areas beyond national jurisdiction, includes requirements for publication of the EIA report and the receipt of comments from the public.[136] The draft Exploitation Regulations do not contain any specific consultation requirements, but do provide in draft regulation 11 for the posting of the "Environmental Plans" (which include the Environmental Impact Statement (EIS) and Environmental Management and Monitoring Plans (EMMP)) and the opportunity for Stakeholder comments. The process is not structured in an iterative fashion. For example, the LTC is required to conduct its review at the same time, and thus will not have the benefit of public comments.[137] The publication of the EIS and EMMP at the same time limits the ability of responses to the EIS to shape the EMMP. In the

Antarctic process, draft documents are posted online with a requirement that the final EIA documents be responsive to the comments provided.[138] The draft Exploitation Regulation allows for revision, but timelines (30 days) provide minimal opportunity for engagement or reassessment of the EMMP.[139] Requiring a more discursive approach may provide more opportunities to build common understandings respecting disputed or ambiguous environmental standards and norms, such as what constitutes "significant harm" or the implementation of precaution in the deep sea marine environment.

EIA Review and Decision-making

The degree of oversight of the draft or final EIA report and how that report and public comments are projected into decisions respecting the activity are distinct questions but are to some degree blurred in EIA practice and best considered together. Turning to the first question, the central concern is ensuring that the assessment of impacts is done in a scientifically sound manner and in accordance with regulatory requirements. The approach taken to this issue depends in part on who is responsible for conducting the environmental impact study. In jurisdictions where the study is undertaken by a government agency, the need for additional government oversight is often viewed as redundant, with a consequent focus on public oversight through the participatory mechanisms discussed in the section above. The U.S. NEPA is a primary example of such an approach, where the lead agency in charge of preparing the report must release the report in draft and incorporate the comments received from the public and other agencies in its preparation of a final report.[140] There is, however, a robust system of judicial review to ensure that EIA reports conform to regulatory requirements. Under the Antarctic Protocol, where discretion to approve the activity remains with the Originating State, the Originating State cannot make a final decision until the Consultative Meeting has had an opportunity to consider the draft CEE, along with the advice of the Committee for Environmental Protection.[141] Once the draft CEE has been considered, the Originating State shall address the comments received in the final CEE. The Consultative Meeting does not approve or reject the draft CEE but is able to exert political influence through the Consultative Meeting.

More commonly, project proponents are responsible for preparing reports, at least in some initial form, which are then subject to review and approval by an overseeing agency. The distinct roles of the proponent and overseeing agency have been formalized in the Canadian *Impact Assessment Act* through a two-part process whereby the proponent prepares an Impact Statement, which provides the information and studies required to make the assessment.[142] The Impact Statement is provided to the Impact Assessment Agency, which must then prepare an Impact Assessment based on those studies.[143] The Agency can request further information, including requesting the proponent to undertake further studies.[144] In other jurisdictions where the proponent has full responsibility for the preparation of reports, there are review mechanisms in place to ensure that the underlying technical information and conclusions drawn from it are scientifically credible.[145] Given the technical nature of these reviews, expert committees are often drawn upon to provide an evaluation of the adequacy of the EIA.[146] In some cases, these experts may be drawn from outside the responsible authority to provide an independent peer review of the EIA report.[147]

EIAs are inputs into a decision-making process and, as such, do not determine the outcome of decisions. Nonetheless, the degree of discretion afforded to the decision maker to approve projects, even in the face of significant environmental impacts, is another area of variance among EIA systems. In the U.S., the essentially procedural nature of NEPA was established by the courts in a number of early decisions.[148] The self-regulatory nature of EIA arises from the underlying purpose of NEPA, which was to require decision makers to account for the environmental consequences of their decisions. Given this retention of discretion, there remain concerns that decision makers may not give the outcomes of EIAs sufficient weight – sometimes referred to as box-ticking, where the decision makers adhere to the formal requirements of the EIA but ignore its findings and recommendations in their decisions. In the U.S., this led to courts imposing an obligation of good faith on agency decision makers that is policed through requirements that decision makers provide clear reasons for their decisions, including addressing relevant comments or concerns raised in the consultation process.[149]

In Canada, the exercise of discretion is carefully circumscribed within the legislation itself, where the decision-making provisions provide that the Minister may determine that the adverse effects identified in a report are acceptable and in the "public interest".[150] It is noteworthy that the decision to approve a project in the face of adverse effects is made at a high level of political accountability, either by the Minister or Cabinet.[151] Moreover, the discretion must be exercised with consideration of the report and in light of a set of factors identified in the Act.[152] The decision is required to be accompanied by detailed reasons that demonstrate that the decision was based on the EIA report and consideration of each of the factors.[153]

The obligation for justification of the final decision, usually in the form of written reasons, is near universal in EIA practice.[154] The Netherlands legislation specifies that a decision on the project includes an explanation of how the potential environmental effects and alternatives described in the EIA study, as well as public feedback and any recommendations by the Netherlands Commission for Environmental Assessment, were considered.[155]

Project decisions subject to EIA are increasingly required to adhere to substantive criteria identified in the EIA legislation or in other relevant regulatory requirements, which will provide further substantial constraints on the exercise of discretion. The World Bank has developed a comprehensive set of overlapping and reinforcing set of environmental and social standards that guide the Bank's decision-making process, and structure the exercise of due diligence by the Bank.[156] The Antarctic Protocol references decisions being based on the CEE and "other relevant considerations",[157] which would include the environmental principles enumerated in article 3 of the Protocol. Unlike domestic contexts, where States have greater freedom to determine the appropriate trade-offs between economic and environmental goals, EIAs conducted in international contexts must account for international legal obligations to prevent transboundary harm and harm to areas beyond national jurisdiction. The obligations to prevent transboundary harm and to minimize adverse effects on biological diversity are specifically referenced in the Espoo Convention and CBD, respectively.[158] EIA processes reflect the normative environment of their application. While the substantive constraints are often expressed at a high level of abstraction, what EIA legislation seeks to do is to ensure that the EIA report contains information that is responsive to the normative requirements and that decision makers demonstrate their

adherence to the substantive requirements of the regime. Public and reasoned justification of the decision goes to the heart of the legitimation function of EIA.

Most EIA systems provide for the ability of the decision makers to impose conditions relating to the development and operation of the undertaking.[159] This is a crucial power in order to ensure that mitigation measures or other steps identified in the EIA to protect, minimize or compensate for environmental harm are implemented by the proponent.

Table 5. Project Approval Decision

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
EIA review	Req.	Recc.	Req.	Req.	Req.	Req.	Req.	Req.	Req.	Req.	Req.
Written reasons by	OS	OS	OS	Bank	Gov't dept.	Govt' dept.	Gov't dept.	CA[i]/ gov't dept.	Gov't agcy	CA[i]	Lead agcy
Time frame (approx.)	15 mths	N/A	N/A	N/A	40 days	30-90 days	N/A	90 days	90 days	45-60 days	30 days

[i] Competent authority as designated by the State.

DSM Considerations

The implementation of EIA requirements in relation to the decision-making component of the EIA process requires consideration of whether review and oversight of the EIA is warranted in this context, and, if it is, how that review might be best accomplished given the institutional structure of the ISA. Turning to the first question, the high levels of scientific uncertainty and the novel nature of both the technologies employed and the methodologies used for assessment militate in favour of a system of robust review. This is particularly the case where, as is the case with DSM, the project proponent has responsibility for conducting the EIA studies. Review of the EIA report can also be justified in light of the legitimation requirements of the EIA process, since careful oversight ought to contribute to public trust in the results of the EIA and the decision the EIA informs.

Addressing the second question requires consideration of the various models for oversight discussed above. The first model, along the lines of NEPA, would be for the presentation of a draft EIA, which is subject to public and agency comments, before finalization. However, this approach may be most appropriate in cases where the agency itself is responsible for the conduct of the EIA. A variation of this model used in the Antarctic Protocol is to have the draft EIA reviewed by the treaty bodies themselves, who offer comments and advice on the draft EIA but do not accept or reject the EIA per se. Alternatively, the treaty bodies could play a more formal role in accepting or rejecting the EIA. Another approach to EIA oversight, suggested by the Canadian *Impact Assessment Act* model, is to have the proponent prepare and submit EIA studies, which would form the basis of a separate assessment by the LTC. The LTC is specifically obligated to "prepare assessments of the environmental implications of activities in the Area".[160] The most extensive form of review and oversight would be the provision of judicial-like review procedures, such as those found in Australia and the Netherlands, or through ex poste compliance reviews, such as those conducted under the World Bank's Inspection Panel process.

The current approach under the EIA Guidelines for exploration activities is to have the LTC review the EIA for "completeness, accuracy and statistical reliability".[161] The LTC has the opportunity to seek further expert input into the review of the EIA. The process is iterative with the Contractor receiving comments from the LTC and those of the public, with an opportunity to respond, before a final recommendation is made.[162] The approach under EIA Guidelines for exploration is informative in several ways. First, it indicates that oversight is likely to be provided by the LTC, which makes sense given the EIA review requires technical expertise not political oversight. Second, the potential for accessing third-party expertise recognizes that the LTC, whose expertise varies over time, may benefit further from an independent review on all or part of the EIA report. Recourse to some form of peer review may also address the workload capacity of the LTC, which only meets at certain points of the year. Unlike the procedures for third-party review in other EIA systems, the process here is ad hoc and not subject to clear procedures. Formalizing this process, with attention to transparency, would reflect best practices. Third, there is a need to clarify the scope of LTC review to ensure that it is empowered to assess the EIA comprehensively and substantively, and is not restricted to "completeness, accuracy and statistical reliability". Fourth, there is public input into the EIA report, but only after it has been finalized. To be clear, the LTC is not a formal decision-making body but rather exercises advisory functions.[163] The LTC has no power to refuse an EIA, but it may recommend to Council rejection of a plan of work where it is of the view that an EIA is insufficient. Finally, oversight processes tend to increase with the potential for adverse impacts, suggesting that the EIA review mechanisms for exploitation plans of work ought to be equally or more robust than those found under the exploration phase.

The timing of reviews may also raise concerns, as the ISA treaty bodies only meet at appointed times. Project EIAs reviewed under the Antarctic system face similar constraints, and the Protocol specifies a 15-month time limitation.[164] It is not clear whether the commercial pressures associated with DSM would require shorter time frames more in line with domestic EIA systems.[165] The time frames identified in the EIA Guidelines,[166] for example, indicate a fairly expeditious process by international and domestic standards. The time frames for public and ISA review ought to account for the complexity and novelty of EIAs in the DSM context, which suggests time periods towards the higher end of prevailing EIA standards, i.e., 90 days or more.

As for the basis and form of the decision taken, it is evident that the LTC, in forming recommendations, and the ISA Council, in approving plans of work, must do so while taking into account the contents of the EIA, although this should be explicit.[167] The discretion of the ISA to approve plans of work that fail to provide effective protection for the marine environment is constrained by the requirement in article 162(2)(x) of LOSC to disprove areas for exploitation where the EIA "indicates risk of serious harm". Moreover, the Authority must be satisfied that the EIA and EMMP are adequate to ensure compliance with the Authority's due diligence obligations to protect the environment, including its obligations under article 145.[168] Other relevant considerations for which decision makers may have to account include:

- Reasonable regard for other users.
- The adoption of best environmental and scientific practices.
- Adherence to the precautionary principle.
- Adherence to appropriate practices of open and inclusive decision-making.

- Regard for other planning documents adopted by the ISA, such as REMPS.

The decision-making criteria for approval of plans of work should be explicitly specified in the regulations. The wording should reference the mandatory requirements of articles 145 and 162(2)(x) and Annex III, articles 6(3) and 17(f). As currently worded the Exploration Regulations require that LTC to "have regard to" these requirements,[169] suggesting a level of discretion that is not available to the LTC, as the LOSC requires that plans of work "comply with and are governed by the relevant provisions of the Convention and the rules, regulations and procedures of the authority".[170] Since the approval of the project is premised on the adoption of mitigation measures, as well as environmental management plans, approvals are subject to conditions that must be adhered to in the development and operation of the project. The ISA processes fully account for this need through the development of EMMP, although clear linkages between the outcomes of the EIA and the requirements contained in the EMMP should be made explicit.

One difficulty, as seen in other EIA systems, is that the standards for identifying and preventing significant harm to the environment are not sufficiently precise to avoid contestation. The normative ambiguity and scientific uncertainty surrounding decisions suggests that decision makers ought to provide written reasons for their decision that are specifically directed to the central issues raised in the EIA and the comments received.[171] The provision of reasons facilitates a greater understanding of how the decision makers, such as the LTC and ISA Council, are understanding and interpreting key evaluative criteria, such as significance. The reasons may usefully address the issue of uncertainty by setting out the basis upon which the identified knowledge gaps are found to be acceptable, and are responsive to the requirements of the precautionary principle. Finally, as the legitimacy of the decision turns on the transparency of the decisions taken, the reasons ought to explicitly address key concerns raised by stakeholders.

Monitoring and Follow-Up

As compliance mechanisms, monitoring and follow-up help a decision maker confirm that a project is being carried out in accordance with the conditions set out in an approval decision and provides an opportunity for adjustment of those conditions in the face of new knowledge.[172] This is commonly achieved through the submission of a follow-up plan proposal, along with regular monitoring reports and project implementation data to an oversight body by the proponent. For example, in Canada, a proponent tracks and reports project information to the Impact Assessment Agency, who in turn verifies whether the proponent is adhering to the approval decision.[173] Under the ISA's guidelines, a Contractor is required to submit a "monitoring programme to determine the potential effect on the marine environment of proposed activities; and to verify that there is no serious harm to the marine environment".[174] Alternatively, follow-up reporting may also be assigned to a third party, which is the case in South Africa, where the environmental audit report is carried out by an independent expert.[175]

Compliance reporting may be used in combination with other follow-up methods, such as on-site inspections, as a form of ongoing project management. This further improves the ability for an oversight body to make an informed decision as to whether a project may progress. Proponents

under the Chinese EIA system must apply for an inspection after the construction phase of a project, which they must pass in order to commence operations on the project site.[176]

Furthermore, with regard to compliance, a finding that a proponent has failed to comply with the conditions of an approval decision may justify certain repercussions, such as the revocation or suspension of an approval decision or license,[177] and the application of penalties, such as fines.[178] Some jurisdictions go a step further to establish a review process that assists proponents in a case of non-compliance to rectify the situation.[179]

An oversight body may also take on a more active role in monitoring and compliance, including the verification of whether there are substantial or significant changes to a project that may require assessment.[180] The World Bank undertakes in its ESS framework the role of monitoring a project that has been approved for funding on an "ongoing basis".[181] EIA systems that assign follow-up responsibilities to an oversight department or agency may decide to establish a separate monitoring body to facilitate and allocate the resources necessary for maintaining a prolonged relationship with the project and proponent. In Canada, oversight obligations (including those related to adaptive management plans, which are "ongoing and iterative")[182] are delegated to monitoring committees established by the Impact Assessment Agency.[183] Similarly, beyond reporting requirements, projects approved in Australia are subject to random inspections and visitations conducted by the Department's Compliance Monitoring Program.[184]

Post-approval reporting is also implicit in verifying EIA outcomes ex post, through tracking of a project's actual environmental effects and comparing these effects with those predicted in the assessment report. In the Netherlands, the proponent is required to cooperate with the competent authority and/or environmental inspectorate as they carry out their duty to investigate and track a project's environmental impacts.[185] Where these investigations reveal "unfavourable consequences for the environment to a major extent",[186] the authority has the power to intervene in order to mitigate or reduce these impacts. Monitoring obligations can also enhance the ability of a State to respond to emergency situations or unforeseen impacts that were not assessed in the EIA. The Antarctic Protocol requires monitoring to "facilitate early detection of possible unforeseen effects of activities",[187] which prevents the escalation of damage caused to the shared Treaty Area.

The significance of post-approval analysis extends beyond verifying how a project is being carried out. At a higher level, the knowledge gained from monitoring and follow-up processes can be used to inform future decisions regarding similar activities and to improve the operation of the EIA framework as a whole. Post-approval analysis is a "valuable feedback mechanism whereby predictive methods and proposed mitigation measures can be continually refined in light of information respecting past activities."[188] Whether through formal[189] or informal[190] methods, experiences gained from previous EIAs can be reused to reduce uncertainties in future decision-making, as well as the time and cost of conducting future EIAs. These feedback and learning processes remain unspecified and underdeveloped in existing EIA systems.

Finally, follow-up processes provide a continued opportunity to protect the interests of affected parties and to allow interested parties, including members of the public,[191] to provide feedback on project implementation outside of judicial and administrative proceedings. Regular and

effective monitoring enhances the transparency of decision-making processes, and authorities should ensure that the public has access to post-approval reports and audits/inspections, which can also form part of the record for judicial and administrative proceedings.[192] While not all of the comparators evaluated in this paper have a formal requirement for monitoring and follow-up procedures, they are nevertheless commonplace in those EIA practices, reflecting the value post-project analysis provides to the current project and for future decisions.

Table 6. Monitoring and Follow-Up

	AP	CBD	Espoo	WB	Aus	Can	China	EU/Ne	Jam	SA	USA
Mandatory follow-up	Yes	Varies	Varies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Varies
Follow-up reporting	Yes	Varies	Yes	No	No	Yes	N/A	Yes	No	No	Yes
Formal feedback/ learning	No	Varies	Yes	No	No	Yes	N/A	Yes	No	No	Yes

DSM Considerations

There are two distinct issues that arise in the post-approval stage. The first is concerned with monitoring and evaluating the actual effects of a project, as measured against the effects predicted in the EIA, and, presumably, upon which the approval was premised. As noted, the DSM regime anticipates a separate, but related, environmental monitoring and management system that will perform these functions. Given the higher degrees of scientific uncertainty associated with DSM assessments, post-approval evaluation will be crucial to the wider credibility of the EIA system for DSM.

The content and operation of such a system goes beyond the scope of this report, but the practice within other jurisdictions points to several factors worth noting. First, post-approval processes ought to be transparent, including access to monitoring data and ISA evaluations of the data. Extending the principles of openness to the post-approval stage contributes to the public trust in the EIA process and confidence in the broader approvals process. Second, because monitoring may require adjustments to operational activities, a reasonable degree of operational flexibility will need to be incorporated into approvals. Insofar as the EIA can identify contingent mitigation measures that can be incorporated into approvals, such practices may provide greater certainty as to the scope of adaptive management procedures. The need for the ISA to be clear about the range of potential post-approval adjustments is critical due to the requirements for security of tenure that arise in the DSM context.

The second issue that arises is building in feedback mechanisms whereby the experience with EIAs and subsequent understandings of actual impacts can inform future EIA practices. Again, the ISA has identified the importance of gathering and publicizing data and is developing an electronic data portal to implement this objective. Standardization of data gathering will promote comparability across EIAs and provide the scientific basis for improvement of EIA studies over time.

Conclusion

This study is animated by the idea that the implementation of EIA requirements and processes will be best achieved through careful attention to the institutional, normative and epistemic conditions of its application. To this end, we identified implementation issues across the various stages of EIA and how those questions have been approached in a variety of comparator jurisdictions and then considered the suitability or "fitness" of various approaches in light of the conditions that are likely to prevail in the context of DSM.

Our objectives in this analysis are both descriptive and prescriptive. Our descriptive goal is to provide an understanding of the practices of EIA in select jurisdictions and international contexts, as well as the key questions that will confront the designers of the ISA's EIA requirements and processes. This leads us to some prescriptive conclusions as to preferability of certain approaches in implementing EIA in the DSM context. These recommendations are offered cautiously, but represent, in our view, a sound approach to EIA implementation.

- All plans of work should be subject to full EIA requirements.
- Any changes to an approved plan of work should be subject to an initial environmental assessment in order to determine its potential to result in significant environmental impacts. In the event that there is likelihood of significant impacts, a full EIA should be carried out.
- In addition to identifying and assessing direct and indirect impacts, and identifying appropriate mitigation measures, EIA studies should address cumulative impacts, as well as identify and assess economically and technologically feasible alternatives to carrying out the project.
- Some issues, for example, the demand for DSM and cumulative impacts across multiple projects, may best be considered as part of assessment processes conducted at a strategic, as opposed to project, level.
- A scoping report should be prepared and made available for public consultation.
- The scoping process should be subject to ISA oversight.
- Consultation with any interested individual or group, including non-governmental organizations and other international organizations, should be mandatory at the scoping and EIA study stages.
- Time frames for consultation and review should be proportionate to the scope and complexity of the assessment materials.
- The Contractor should be required to indicate how it plans to address issues raised through public consultation as part of its final submission to the ISA.
- The final EIA should be subject to ISA oversight to ensure conformity to the scoping requirements, completeness, and scientific and statistical soundness. Peer review of final EIA reports ought to be provided for, where warranted.
- Any final decision must take into account the EIA study and public comments received, and should specifically address whether the proposed activity presents a risk of serious harm and whether the plan of work complies with the marine protection requirements of the LOSC and the rules, regulations and procedures of the Authority. EIA requirements should identify other relevant considerations in determining the acceptability of impacts, including, but not limited to:

    - reasonable regard for other users;
    - the adoption of best environmental and scientific practices;
    - adherence to the precautionary principle;
    - adherence to appropriate practices of open and inclusive decision-making; and,
    - regard for other planning documents adopted by the ISA, such as REMPS.
- The LTC in providing its recommendation to Council should provide written reasons for its decision that address key areas of concern, including those issues and concerns raised by stakeholders through the consultation process.
- Monitoring and follow-up incorporated into the Environmental Management and Monitoring Plan should reflect the findings of the EIA. The range of post-approval adjustments (adaptive management) should be clearly anticipated as part of the EMMP.
- The ISA should incorporate feedback and learning opportunities to ensure that knowledge from past EIAs informs and improves subsequent EIA studies and practices.

Comparator	Reference
Antarctic Protocol	Protocol on Environmental Protection to the Antarctic Treaty (adopted 4 October 1991, entered into force 14 January 1998) 2941 UNTS 3
Convention on Biological Diversity	Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79 CBD COP, "Impact Assessment: Voluntary Guidelines on Biodiversity-inclusive Impact Assessment" (2006) UNEP/CBD/COP/DEC/VIII/28
Espoo Convention	Convention on Environmental Impact Assessment in a Transboundary Context (adopted 25 February 1991, entered into force 10 September 1997)
World Bank (ESS)	World Bank, "World Bank Environmental and Social Framework" (2017) World Bank, "Guidance Note for Borrower—ESS1: Assessment and Management of Environmental and Social Risks and Impact" (2018) *Previously –* World Bank, "Bank Procedure (BP) 4.01—Environmental Assessment" (January 1999) BP 4.01
Australia	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
Canada	Impact Assessment Act, SC 2019, C 28
China	Environmental Protection Law of the People's Republic of China (2014) and EIA Regulations (amended 2017) (the NCEA's unofficial English translations were used for this paper)
EU Directive	Council Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the Assessment of the Effects of Certain Public and Private Projects on the Environment [2011] 2011/92/EU (with 2014 amendments)
The Netherlands	NCEA profile
Jamaica	Natural Resources Conservation Authority Act (1991) National Environment and Planning Agency, "Guidelines for Conducting Environmental Impact Assessments" (2007)
South Africa	National Environmental Management Act 1998 (NEMA) and EIA Regulations
United States	National Environmental Policy Act (1969) 42 U.S.C. §4321 Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR 1500-1508 (2005)

Endnotes

[1] J. Durden et al., "Environmental Impact Assessment Process for Deep-Sea Mining in the Area," *Marine Policy* 87 (2018): 194–202, https://doi.org/10.1016/j.marpol.2017.10.013; J.D. Malcolm Clarke and S. Christiansen, "Environmental Impact Assessments for Deep-Sea Mining: Can We Improve Their Effectiveness?," *Marine Policy* 114 (2020), https://doi.org/10.1016/j.marpol.2018.11.026.
[2] U.N. Convention on the Law of the Sea (1982), https://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm.
[3] International Tribunal for the Law of the Sea (ITLOS), "Advisory Opinion on the Responsibilities and Obligations of States Sponsoring Persons and Entities With Respect to Activities in the Area" (2011).
[4] International Seabed Authority (ISA), Resolution ISBA/18/A/11, Regulations on Prospecting and Exploration for Cobalt-Rich Ferromanganese Crusts in the Area (2012); ISA, Resolution ISBA/19/C/17 (RPEN), Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (2013); ISA, Resolution ISBA/16/A/12/Rev.1, Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area (2010); ISA, Resolution ISBA/25/LTC/6/Rev.1, Review of the Recommendations for the Guidance of Contractors for the Assessment of Possible Environmental Impacts Arising from the Exploration for Marine Minerals in the Area (30 March 2020); ISA, Draft Regulations on Exploitation of Mineral Resources in the Area (March 25, 2019), https://www.isa.org.jm/document/isba25cwp1-0.
[5] U.N. Environment Programme, "Assessing Environmental Impacts—A Global Review of Legislation" (discussing an "implementation gap" between EIA legislation and practice).
[6] B. Karkkainen, "Towards a Smarter NEPA: Monitoring and Managing Governments Environmental Performance," *Columbia Law Review* 102, no. 4 (2002): 903; U.N. Environment Programme, "Assessing Environmental Impacts—A Global Review of Legislation"; U.S. National Environment Policy Act [NEPA] 42 U.S.C. §4321 (1969).
[7] C. Wood, "Environmental Impact Assessment: A Comparative Review," *Marine Policy* (2013); N. Craik, E. Lees, and J. E. Viñuales, eds., *The Oxford Handbook of Comparative Environmental Law* (Oxford University Press, 2019).
[8] O.R. Young, *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale* (MIT Press, 2002)—developing the concept of institutional fitness.
[9] Pulp Mills on the River Uruguay (Argentina v. Uruguay), International Court of Justice; Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua), and Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v. Costa Rica), International Court of Justice, 2015.
[10] N. Craik, *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (Cambridge University Press, 2018).
[11] N. Craik, "The Duty to Cooperate in the Customary Law of Environmental Impact Assessment," *International and Comparative Law Quarterly* 69, no. 1 (2020): 1-21.
[12] M.F. Tetlow and M. Hanusch, "Strategic Environmental Assessment: The State of the Art," *Impact Assessment and Project Appraisal* 30, no. 1 (2012): 15–24; N. Craik and K. Gu, "Implementation of Strategic Environmental Assessments in Marine Areas Beyond National Jurisdiction" (working paper, World Wildlife Fund [WWF], 2019), https://dx.doi.org/10.2139/ssrn.3421525.
[13] U.N. Environment Programme, "Assessing Environmental Impacts—A Global Review of Legislation."
[14] U.N. Convention on the Law of the Sea (Dec. 10, 1982). Article 1(1) defines the "Area" as the "seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction."
[15] Ibid., Article 137(2).
[16] Ibid., Article 153.
[17] ISA, Resolution ISBA/19/C/17 (RPEN). Regulation 26(1); ISA, Resolution ISBA/25/C/WP.1, Draft Exploitation Regulations (2019). 20(1).
[18] Article 153(6) and Annex III, Article 18.
[19] Ibid., Annex III, Article 19.
[20] Ibid., Article 153(2). There is also provision for mining to be conducted by the Enterprise, the mining arm of the ISA; see U.N. Convention on the Law of the Sea, Article 170. For a list of current contractors, see ISA, "Exploration Contracts," https://isa.org.jm/deep-seabed-minerals-contractors.
[21] The regulations are adopted in the first instance by Council and approved by the Assembly.

[22] ISA, Resolution ISBA/25/C/WP.1.
[23] Ibid.
[24] Resolution Annex, Section 3(11)(a). Agreement Relating to the Implementation of Part XI of the U.N. Convention on the Law of the Sea (10 December 1982), Annex, Section 3(11)(a).
[25] The LTC may also undertake work on an intersessional basis.
[26] Resolution ISBA/25/LTC/6/Rev.1, Recommendations for the Guidance of Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Marine Minerals in the Area (2019), paragraph 41(b), (the Secretary-General will acknowledge the receipt of the environmental impact statement within 30 days and check for completeness against the template as contained in Annex III to the present recommendations).
[27] U.N. Convention on the Law of the Sea, Article 162(2)(z).
[28] Ibid., Annex, Section 1(7) and Article 165(2)(d) (the Legal and Technical Commission [LTC] is also required to "prepare assessments of the environmental implications of activities in the Area").
[29] ISA, Resolution ISBA/19/C/17 (RPEN). Regulation 25(1).
[30] Ibid., Regulation 18(c).
[31] ISA, Resolution ISBA/19/C/17 (RPEN). Annex IV, Section 5.2.
[32] ISA, "Recommendations for the Guidance of Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Marine Minerals in the Area" (2019), ISBA/25/LTC/6/Rev.1 (2019 Recommendations).

[33] See, however, endnote 132, infra, on U.N. Convention on the Law of the Sea, Article 142.
[34] ISA, "EIAs Filed Under Exploration Regulations," accessed May 19, 2021, https://www.isa.org.jm/minerals/environmental-impact-assessments.
[35] ISA, Resolution ISBA/25/A/16, Annex, Rules of Procedure of the Assembly, Rule 82—Definition of Observers (1994); ISA, Resolution ISBA/25/A/16, Decision of the Assembly on the Guidelines for Observer Status of Non-Governmental Organizations (2019).
[36] U.N. Convention on the Law of the Sea (see endnote 2), Article 187(d) and 1994 Agreement (see endnote 24), Annex, Section 3(12).
[37] U.N. Convention on the Law of the Sea, Article 187(d); U.N. Convention on the Law of the Sea, Annex III, Article 4(4).
[38] *Pulp Mills.*
[39] U.N. Convention on the Law of the Sea, Article 136.
[40] ITLOS, "Advisory Opinion," paragraph 110.
[41] U.N. Convention on the Law of the Sea, articles 162(2)(x) and 165(2)(l).
[42] Ibid., Annex III, Article 6(3).
[43] Ibid., Article 145.
[44] *Pulp Mills*, paragraph 141.
[45] ITLOS, Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua) and Construction of a Road in Costa Rica Along the San Juan River (Nicaragua v Costa Rica) (Judgment) [2015], Report 665; ITLOS, Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area (advisory opinion of 1 February 2011), paragraph 111.
[46] P. Birnie, A. Boyle, and C. Redgwell, *International Law and the Environment* (Oxford University Press, 2009); P. Sands and J. Peel, *Principles of International Law* 4th Edition (2018); ITLOS, "Advisory Opinion."
[47] ISA, Resolution ISBA/25/C/WP.1, Draft Regulation 2.
[48] ITLOS, "Advisory Opinion," paragraphs 125–137.
[49] Resolution ISBA/18/C/22, Decision of the Council Relating to an Environmental Management Plan for the Clarion-Clipperton Zone (2012).
[50] L. Levin, D. Amon, and H. Lily, "Challenges to the Sustainability of Deep-Seabed Mining," *Nature Sustainability* (2020): 784–94, https://doi.org/10.1038/s41893-020-0558-x.
[51] N. Craik, "Implementing Adaptive Management in Deep Seabed Mining: Legal and Institutional Challenges," *Marine Policy* (2018), https://www.sciencedirect.com/science/article/pii/S0308597X18303178; S. Gollner et al., "Resilience of Benthic Deep-Sea Fauna to Mining Activities," *Marine Policy* 129 (August 2017): 96, https://www.sciencedirect.com/science/article/abs/pii/S0141113617302441.

[52] L.A. Levin et al., "Defining 'Serious Harm' to the Marine Environment in the Context of Deep-Seabed Mining," *Marine Policy* 74 (2016): 245–59, https://doi.org/10.1016/j.marpol.2016.09.032; Levin, Amon, and Lily, "Challenges to the Sustainability of Deep-Seabed Mining." The relationship between the requirements for "effective protection" from "harmful effects" in Article 145 of the LOSC and the avoidance of "serious harm" in Article 162(2)(x) raises some ambiguity. Both inform due diligence, with the requirement for effective protection identifying the means, which include the development of an EMMP, to ensure the outcome of no serious harm to the environment. Our point here is that a degree of uncertainty inserts a measure of discretion that cannot be determined with reference to scientific facts alone.
[53] ISA, "Deepdata Database," https://www.isa.org.jm/deepdata.
[54] N. Yost and G. Widman, "The 'Action-Forcing' Requirements of NEPA and Ongoing Actions of the Federal Government," *Environmental Law Reporter* 34, no. 5 (2004).
[55] Calvert Cliffs' Coordinating Committee Inc. v. United States Atomic Energy Commission (D.C. Circuit Court, 1971); R. Lazarus, "The National Environmental Policy Act in the U.S. Supreme Court: A Reappraisal and a Peek Behind the Curtains," *Georgetown Law Journal* 100, no. 5 (2012): 1507–58.
[56] D.C. Donato et al., "Mangroves among the Most Carbon-Rich Forests in the Tropics," *Nature Geoscience* 4, no. 5 (2011): 293–97, https://doi.org/10.1038/ngeo1123.
[57] CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines), Impact Assessment: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment (2006).
[58] World Bank, "World Bank Environmental and Social Framework" (2017).
[59] Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals, Government of Canada (2010); NEPA, § 102 (1969) (where SEA is subject to high levels of agency discretion). In Europe, SEA is required for policy decisions that set the framework for future projects; European Parliament and European Council, Assessment of the Effects of Certain Plans and Programmes on the Environment, Directive 2001/42, Article 3 (21 July 2001).
[60] U.S. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR 1500-1508 (2005).
[61] See, for example, *Pulp Mills* case (endnote 9).
[62] Ibid; U.S. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, §1501.4 (1997).
[63] World Bank, "World Bank Environmental and Social Framework," at classification of projects based on risk levels; Convention on Environmental Impact Assessment in a Transboundary Context (adopted 25 February 1991, entered into force 10 September 1997) (Espoo Convention) Article 2(3); Impact Assessment Act, SC 2019, C 28, Government of Canada (2019); Environment Protection and Biodiversity Conservation Act, Australia (1999).
[64] Antarctic Protocol, Resolution Annex I, Article 3(1), Protocol on Environmental Protection to the Antarctic Treaty.
[65] Impact Assessment Act, SC 2019, C 28; U.S. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, § 1501.4.
[66] Impact Assessment Act, SC 2019, C 28.
[67] European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment, Council Directive 2011/92/EU, Articles 4(1) and 4(2) (2011).
[68] Environmental Protection Law of the People's Republic of China (2014); EIA Regulations (amended 2017) Article 16 (the NCEA's unofficial English translations were used for this paper, https://www.commissiemer.nl/docs/os/sea/legislation/china_s_ea_legislation_03.pdf); Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, vol. 594, no. 38282 (2014 with 2017 amendments); Antarctic Protocol, Resolution Annex I, Protocol on Environmental Protection to the Antarctic Treaty.
[69] Environment Protection and Biodiversity Conservation Act.
[70] U.S. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, § 1501.4.
[71] Impact Assessment Act, SC 2019, C 28.
[72] Under World Bank, "Bank Procedure (BP) 4.01 – Environmental Assessment" (January 1999), which is replaced by the ESS Framework for new projects, the task team is charged with examining the project. Other examples are the Netherlands Commission for Environmental Assessment and China's main national-level authority, the Ministry of Ecology and the Environment.

[73] SEA processes may also provide opportunities for cross-sectoral assessments, better accounting for the interests of, and impacts from, fisheries, shipping, and other emerging high-seas activities, as required by Article 147 of the U.N. Convention on the Law of the Sea.
[74] Discussed below.
[75] ISA, Resolution ISBA/19/C/17 (RPEN). Regulation 18(c).
[76] Ibid., Annex IV, Section 5.
[77] ISA, Resolution ISBA/25/LTC/6/Rev.1, paragraphs 32–33.
[78] Ibid., paragraph 41. The LTC reviews the EIA and provides a recommendation "to the Secretary-General as to whether the EIA should be incorporated into the programme of activities under the contract." If the recommendation is to not incorporate the EIA, the contractor may either submit another EIA or provide additional information, which is then reviewed again by the LTC.
[79] Antarctic Protocol, Resolution Article 8(3), Protocol on Environmental Protection to the Antarctic Treaty.
[80] ISA, Resolution ISBA/25/C/WP.1, Definition of "Material Change;" see also draft regulation 57.
[81] World Bank, "World Bank Environmental and Social Framework," at 26.
[82] Guidelines for Conducting Environmental Impact Assessments, 14, Section 2.3 (2007).
[83] Economic Commission for Europe, Resolution Article 1(vii), Convention on Environmental Impact Assessment in a Transboundary Context.
[84] Impact Assessment Act, SC 2019, C 28 (definition of "effects within federal jurisdiction").
[85] Convention on Biological Diversity, Resolution UNEP/CBD/COP/DEC/VII/16, Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at Its Seventh Meeting (13 April 2004).
[86] World Bank, "World Bank Environmental and Social Framework."
[87] NEPA, § 1508.7.
[88] Antarctic Protocol, Resolution Annex 1, Article 3(2), Protocol on Environmental Protection to the Antarctic Treaty.
[89] Cumulative Effects Assessment Practitioners Guide, Canadian Environmental Assessment Agency (1999); U.S. EPA, "Consideration of Cumulative Impacts in EPA Review of NEPA Documents" (1999), EPA 315-R-99-002.
[90] Convention on Biological Diversity, Resolution Background document to CBD Decision VIII/28, Commission for Environmental Assessment, Biodiversity in EIA & Sea, Voluntary Guidelines (2006); European Commission, "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment" (2013); Council on Environmental Quality (CEQ), Incorporating Biodiversity Considerations into Environmental Impact Analysis under the National Environmental Policy Act (1993); Canadian Environmental Assessment Agency, Guide on Biodiversity and Environmental Assessment (1996); Netherlands Commission for Environmental Assessment (NCEA), Recommendations on Climate Change in Environmental Assessment (2009).
[91] NEPA, § 1502.14.
[92] Ibid.
[93] Antarctic Protocol, Resolution Annex I, Article 3(1).
[94] Impact Assessment Act, SC 2019, C 28, Canada (see endnote 63), Section 22.
[95] Ibid.
[96] Antarctic Treaty Consultative Meeting (ATCM), Resolution ATCM XXXIX Final Report, 10, paragraph 3.2, Annex: Revised Guidelines for Environmental Impact Assessment in Antarctica; NEPA, § 1507.2; Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, Section 24.
[97] Convention on Biological Diversity, Resolution background document to CBD Decision VIII/28; European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment Council Directive 2011/92/EU, Article 4(3) (2011).
[98] CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines), 23.
[99] Environment Protection and Biodiversity Conservation (EPBC) Act 1999, Environmental Offsets Policy, Commonwealth of Australia (October 2012); World Bank, "Guidance Note [GN] for Borrower – Ess1: Assessment and Management of Environmental and Social Risks and Impact" (2018); GN27.3, step 4 ("Where avoidance, minimization, or mitigation is not adequate to manage significant adverse risks and impacts, it may be appropriate to design and implement measures that compensate/offset for residual risks and impacts").
[100] Republic of South Africa Department of Environment Affairs, Government Gazette, Public Participation, Chapter 6, Section 22, Appendix 2 (2010); Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU), (2017).

[101] U.N. Convention on the Law of the Sea, Article 140 (16 November 1994), https://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm; U.N. Convention on the Law of the Sea, Article 1 of 1994 Agreement Relating to the Implementation of Part XI.
[102] J. Aguon and J. Hunter, "Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Regime," *Stanford Environmental Law Journal* 38, no. 1 (2019), https://law.stanford.edu/publications/second-wave-due-diligence-the-case-for-incorporating-free-prior-and-informed-consent-into-the-deep-sea-mining-regulatory-regime/.
[103] Cumulative effects are included in the definition of "environmental effect" in the draft regulations (endnote 4) schedule, definition of "Environmental Effect."
[104] ISA, Resolution ISBA/25/LTC/6/Rev.1, Recommendations for the Guidance of Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Marine Minerals in the Area (30 March 2020), paragraph 16.
[105] H.J. Niner et al., "Deep-Sea Mining With No Net Loss of Biodiversity—An Impossible Aim," *Frontiers in Marine Science* 5, no. 53 (2018), https://doi.org/10.3389/fmars.2018.00053.
[106] Draft Regulations (endnote 4), draft regulation 47; see also Annex IV, Section 3.7, providing an account of alternative options but not an assessment of these alternatives.
[107] See U.N. Convention on the Law of the Sea, Annex III, Article 10 (providing for the preference and priority of exploration contractors to apply for exploitation contracts over the same area). The ability of the ISA to limit DSM activities may also be affected by requirements of nondiscrimination; see U.N. Convention on the Law of the Sea, Article 152.
[108] Ibid., Article 165.
[109] Resolution ISBA/25/LTC/6/Rev.1, paragraph 41 (the review is limited in scope to technical compliance matters).
[110] Draft Regulations (endnote 4), draft regulation 47 (the approach is to provide direction on the content of the study through a nonprescriptive template).
[111] CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines), 38—participation as a "prerequisite for effective EIA" and "relevant in all stages."
[112] Antarctic Protocol (endnote 64) (not required); Canada (endnote 63) (discretionary); Netherlands/Australia (endnote 63) (depends on the type of EIA process to which the project is subject).
[113] Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, Chapter 6 (n South Africa, public participation is also required during the screening stage).
[114] NEPA, Draft, Final, and Supplemental Statements, 40 CFR § 1502.9.
[115] Environment Protection and Biodiversity Conservation (EPBC) Act 1999, Environmental Offsets Policy, sections 85(e) 131 and 131A; NEPA, § 1506.6(c); Environmental Protection Law of the People's Republic of China, Article 21
[116] See especially Canada (endnote 63); Australia (endnote 63).
[117] World Bank, "Inspection Panel—Operating Procedures" (April 2014), https://www.inspectionpanel.org/sites/ip-ms8.extcc.com/files/documents/2014%20Updated%20Operating%20Procedures.pdf.
[118] European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment, Council Directive 2011/92/EU, Article 1(2)(e).
[119] World Bank, "World Bank Environmental and Social Framework" (see at 10, use of "project-affected").
[120] Antarctic Protocol, Resolution Annex I, Article 3(3), Protocol on Environmental Protection to the Antarctic Treaty; CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines), 38; Economic Commission for Europe, Resolution Article 2(2), Convention on Environmental Impact Assessment in a Transboundary Context; J. Ebbeson, "Public Participation," in *The Oxford Handbook of International Environmental Law*, eds. D. Bodansky, J. Brunnée, and E. Hey (Oxford University Press, 2008).
[121] European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment, paragraph 3 ("local nongovernmental organizations").
[122] NEPA, § 1503.
[123] Antarctic Protocol, Resolution Article 12(2), Protocol on Environmental Protection to the Antarctic Treaty (4 October 1991, entered into force 14 January 1998).
[124] World Bank, "World Bank Environmental and Social Framework"; CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines).
[125] Antarctic Protocol, Resolution Annex I, Article 3(4), Protocol on Environmental Protection to the Antarctic Treaty.

[126] Guidelines for Conducting Environmental Impact Assessments, Annex II at 29, Jamaica National Environment and Planning Agency (allows for the EIA report to remain open for public feedback for a period of 30 days); see also Canada (endnote 63), Section 75(1) ("participant funding programs").
[127] Wellington International Airport Ltd. v. Air New Zealand, 1 NZLR 671 (Court of Appeal Wellington, 1993).
[128] S. Sasaki et al., "Household Income, Living and Working Conditions of Dumpsite Waste Pickers in Bantar Gebang: Toward Integrated Waste Management in Indonesia," *Resources, conservation and recycling* 89 (2014): 11–21.
[129] NEPA, 1503.4; CBD Conference of the Parties (COP), Resolution UNEP/CBD/COP/DEC/VIII/28 (CBD Voluntary Guidelines), 38 ("real" participation is "shared analysis and assessment").
[130] U.N. Convention on the Law of the Sea, articles 205 and 206.
[131] Economic Commission for Europe, Resolution Article 6(3), Convention on Environmental Impact Assessment in a Transboundary Context.
[132] U.N. Convention on the Law of the Sea, Article 142; ITLOS, "Advisory Opinion," paragraph 148.
[133] ISA, "Submissions Received with Respect to the Stakeholder Consultations on Standards and Guidelines," accessed 13 April 2021, https://www.isa.org.jm/submissions-received-respect-stakeholder-consultations-standards-and-guidelines.
[134] Draft regulations (endnote 4) schedule, definition of "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).
[135] ISA, "Observers," accessed 13 April 2021, https://www.isa.org.jm/observers.
[136] Antarctic Protocol, Resolution Annex I, Article 3, Protocol on Environmental Protection to the Antarctic Treaty.
[137] ISA, Resolution ISBA/25/C/WP.1, paragraph 11(1)(b), Draft Exploitation Regulations.
[138] Antarctic Protocol, Resolution Annex I, Article 3.
[139] ISA, Resolution ISBA/25/C/WP.1, paragraph 11(2), Draft Exploitation Regulations.
[140] U.S. Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, § 1501.7(a) (1997).
[141] Antarctic Protocol, Resolution Annex I, Article 3(5), Protocol on Environmental Protection to the Antarctic Treaty.
[142] S. Fatima, "Chemical Recycle of Plastics," *American Journal of Engineering Research* 3, no. 11 (2014): 93–108, http://www.ajer.org/papers/v3(11)/L03110930108.pdf.
[143] Ibid., Section 28.
[144] Ibid., Section 26.
[145] Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, Section 24 l; National Environmental Management Act, Section 11(1), Jamaica (1998), see the accompanying guidelines (endnote 82), 4; Environmental Protection Law of the People's Republic of China (2014) and EIA Regulations (amended 2017), Article 16 (the NCEA's unofficial English translations were used for this paper), https://www.commissiemer.nl/docs/os/sea/legislation/china_s_ea_legislation_03.pdf.
[146] See, however, Australia (endnote 63), where it is subject to ministerial approval, https://www.environment.gov.au/epbc.
[147] See, e.g., South Africa (endnote 68), South Africa National Environmental Management Act 1998, Section 24 I.
[148] NEPA, § 102; Lazarus, "The National Environmental Policy Act in the U.S. Supreme Court."
[149] Greater Boston Television Corp. v. FCC, 44 F.2d 841, p. 851 (D.C Circuit Court, 1970).
[150] Canada Impact Assessment Act (2019), Section 50.
[151] Where an impact assessment report shows the project can be carried on without causing significant harm (taking into account mitigation measures), the decision is made at lower levels.
[152] OECD, *Improving Markets for Recycled Plastics: Trends, Prospects and Policy Responses* (OECD Publishing, 2018), https://www.oecd.org/environment/improving-markets-for-recycled-plastics-9789264301016-en.htm.
[153] Ibid., Sectioin 65(2).
[154] Economic Commission for Europe, Resolution Article 6(2), Convention on Environmental Impact Assessment in a Transboundary Context; European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment, Article 8(a)(1). See, however, China (endnote 68).

[155] National Bureau of Statistics of China, *China Statistical Yearbook 2018* (China Statistics Press, 2019), http://www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm.
[156] World Bank, "Assessment and Management of Environmental and Social Risks and Impact" (2018).
[157] Antarctic Protocol, Resolution Annex I, Article 4, Protocol on Environmental Protection to the Antarctic Treaty.
[158] Economic Commission for Europe, Resolution Article 2, Convention on Environmental Impact Assessment in a Transboundary Context; U.N. General Assembly, Resolution Article 14, Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993).
[159] Economic Commission for Europe, Resolution Appendix V, Convention on Environmental Impact Assessment in a Transboundary Context; Environment Protection and Biodiversity Conservation Act; A. Telesetsky, "Laundering Fish in the Global Undercurrents: Illegal, Unreported, and Unregulated Fishing and Transnational Organized Crime," *Ecology Law Quarterly* 41 no. 4 (2014): 939, http://search.ebscohost.com/login.aspx?direct=true&db=edshol&AN=edshol.hein.journals.eclawq41.36&site=eds-live&authtype=sso&custid=s3229936; Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, Section 26(d)(iv).
[160] U.N. Convention on the Law of the Sea, Article 165(2)(d).
[161] Resolution ISBA/25/LTC/6/Rev.1, paragraph 41(c).
[162] Ibid., paragraph 41(f)–(h).
[163] U.N. General Assembly, Resolution Article 165(2)(b), Convention on the Law of the Sea (which authorizes the LTC to "review" plans of work).
[164] Antarctic Protocol, Resolution Annex I, Article 3(5).
[165] See Table 5.
[166] ISA Guidelines (endnote 77), paragraph 41 (30 days for public review; 60 days for the contractor to respond to comments from the LTC or public—the guidelines do not specify a time frame for the LTC to complete the review).
[167] Antarctic Protocol, Resolution Annex I, Article 4.
[168] U.N. Convention on the Law of the Sea, Annex III, Article 6(3).
[169] ISA, Resolution ISBA/25/C/WP.1. Draft regulation 12.
[170] U.N. Convention on the Law of the Sea, Annex III, Article 6(3).
[171] Craik, "The Duty to Cooperate in the Customary Law of Environmental Impact Assessment."
[172] Economic Commission for Europe, Resolution Appendix V.
[173] D.G.M. Miller and E. Clark, "Promoting Responsible Harvesting by Mitigating IUU Fishing: a Three-Block and OODA Construct?," *Australian Journal of Maritime and Ocean Affairs* 8, no. 1 (2016): 3–42, available through interlibrary loan.
[174] Resolution ISBA/25/LTC/6/Rev.1.
[175] Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, Section 34(1); World Bank, "Assessment and Management," paragraph 58 ("Bank will require the Borrower to engage stakeholders and third parties, such as independent experts, local communities or nongovernmental organizations [NGOs], to complement or verify project monitoring information").
[176] Y. Ropert-Coudert et al., "Two Recent Massive Breeding Failures in an Adélie Penguin Colony Call for the Creation of a Marine Protected Area in D'urville Sea/Mertz," *Frontiers in Marine Science* 5 (2018); Q. Chen, Y. Zhang, and A. Ekroos, "Comparison of China's Environmental Impact Assessment (EIA) Law with the European Union (EU) EIA Directive," *Environmental Monitoring Assessment Journal* (2007).
[177] U.N. Educational, Scientific and Cultural Organization, "Saya De Malha Bank, Mascarene Plateau," last modified 30 January 2020, http://www.vliz.be/projects/marineworldheritage/sites/2_Masc%20Plateau_S%20Malha.php?item=The%20Indian%20Ocean; National Environmental Management Act, Section 11(1).
[178] Convention on Biological Diversity, Ecologically or Biologically Significant Areas (EBSAs), Saya De Malha Bank, 12 June 2015, https://chm.cbd.int/database/record?documentID=204017; Republic of South Africa Department of Environment Affairs, National Environmental Management Act 1998, sections 27–33.
[179] For instance, under the Canadian system, the Impact Assessment Agency will provide support, where necessary, for noncompliance; see also Canada (endnote 63), Section 156(2)(e).
[180] Antarctic Protocol, Resolution Article 8(3).
[181] World Bank, "World Bank Environmental and Social Framework," paragraph 56.
[182] Craik, "Implementing Adaptive Management" (see endnote 51).

[183] Impact Assessment Act, 156(2)(e), Government of Canada.
[184] Government of Australia, "Compliance Monitoring Program 2015–2016," https://www.environment.gov.au/epbc/publications/compliance-monitoring-program-2015-16.
[185] Netherlands Commission for Environmental Assessment (NCEA), Recommendations on Climate Change in Environmental Assessment.
[186] Ibid.
[187] Antarctic Protocol, Resolution Article 3(2)(e), Protocol on Environmental Protection to the Antarctic Treaty.
[188] Craik, Lees, and Viñuales, *The Oxford Handbook of Comparative Environmental Law,* Section 2.7. As stated in the Espoo Convention (endnote 63), Appendix V(c), one objective of postproject analysis is the "verification of past predictions in order to transfer experience to future activities of the same type."
[189] Economic Commission for Europe, Convention on Environmental Impact Assessment in a Transboundary Context (through the Review of Implementation Questionnaire); Canada Impact Assessment Act, Section 6(1)(n); European Parliament and European Council, Assessment of the Effects of Certain Public and Private Projects on the Environment, Council Directive 2011/92/EU, Article 12(2).
[190] Antarctic Protocol, Resolution Article 17 (Annual Report), Protocol on Environmental Protection to the Antarctic Treaty (4 October 1991, entered into force 14 January 1998).
[191] In Canada, this is particularly important in further protecting Indigenous rights; see Canada (endnote 63), Section 156(2)(e).
[192] NEPA, §1505.2.